UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ELECTION SYSTEMS & SOFTWARE, LLC.
Petitioner,

v.

HART INTERCIVIC, INC.
Patent Owner.

Case: PGR2025-0066
Patent 12,125,319 B2

DECLARATION OF MICHAEL I. SHAMOS, PH.D., J.D.

I, Michael I. Shamos, declare as follows:

I. INTRODUCTION AND QUALIFICATIONS

1. I have been retained by Patent Owner Election Systems & Software, LLC ("ES&S") to provide technical analysis and opinions relating to the invalidity of U.S. Patent No. 12,125,319 ("the '319 Patent" or the "Patent") in this proceeding.

2. I currently hold the title of Distinguished Career Professor in the School of Computer Science at Carnegie Mellon University in Pittsburgh, Pennsylvania. I am a member of two departments in that School, the Software and Societal Systems Department and the Language Technologies Institute. I was a founder and Co-Director of the Institute for eCommerce at Carnegie Mellon from 1998-2004. From 2004-2018 I was Director of the eBusiness Technology graduate program in the Carnegie Mellon University School of Computer Science. Since 2018, I have been Director of the M.S. in Artificial Intelligence and Innovation (MSAII) degree program at Carnegie Mellon. My Curriculum Vitae is attached to this declaration as Appendix C.

3. I have an A.B. degree from Princeton University in Physics, an M.A. degree from Vassar College in Physics, an M.S. degree from American University in Technology of Management, an M.S. degree from Yale University in Computer

Science, an M. Phil. from Yale University in Computer Science, a Ph.D. from Yale University in Computer Science, and a J.D. degree from Duquesne University.

4. I have taught graduate courses at Carnegie Mellon in Electronic Commerce, including eCommerce Technology, Electronic Payment Systems, Electronic Voting, Internet of Things, Electronic Payment Systems and eCommerce Law and Regulation, as well as Analysis of Algorithms. Since 2007, I have taught an annual course in Law of Computer Technology. My course on Law of Computer Technology is required by three graduate programs at Carnegie Mellon, MSAII, the Master's in Privacy Engineering, and the Ph.D. program in Societal Computing. I currently also teach Artificial Intelligence and Future Markets. From 2001-2021, I was a Visiting Professor at the University of Hong Kong, where I taught an annual course in Electronic Payment Systems.

5. From 1979-1987 I was the founder and president of two computer software development companies in Pittsburgh, Pennsylvania, Unilogic, Ltd. and Lexeme Corporation.

6. From 1980 through 1996 I was a statutory examiner of computerized voting systems for the Commonwealth of Pennsylvania. During that period, I participated in every electronic voting system certification examination conducted in Pennsylvania.

7. From 2004-2016 I served as consultant to the Secretary of the Commonwealth of Pennsylvania on electronic voting matters.

8. From 1987-2000 I served as statutory designee of the Attorney General of Texas for examination of voting systems pursuant to the Texas Election Code. During that period, I participated in every electronic voting system certification examination conducted in Texas.

9. I have examined voting systems for the duly constituted authorities in Massachusetts (2006), Delaware (1989), Nevada (1995) and West Virginia (1982). To date, I have performed over 120 electronic voting system certification examinations.

10. I have been invited to speak on electronic voting at conferences and panels by the League of Women Voters, the County Commissioners Association of Pennsylvania, the Election Center, John Marshall Law School, Ohio State Moritz School of Law, University of Maryland, Pace University, University of Hong Kong, International Workshop on Mathematics and Democracy, Rutgers University, National Institute of Standards and Technology, American Association for the Advancement of Science, Congressional Black Caucus, Election Assistance Commission, American Enterprise Institute and the U.S. Commission on Civil Rights.

11. I testified four times before committees of the U.S House of Representatives on electronic voting and once before the U.S. Senate Committee on Rules and Administration.

12. I have testified on electronic voting before the legislatures of Maryland, Pennsylvania, and Texas and the State Board of Elections of Virginia.

13. I am the sole author of three papers on electronic voting.

14. I am the author of a book manuscript entitled "A Glossary of Electronic Voting," which contains over 1000 definitions of terms relating to that subject.

15. I am an attorney admitted to practice in Pennsylvania and have been admitted to the Bar of the U.S. Patent and Trademark Office since 1981. I have been asked to render opinions in this declaration as a technical expert. I have not been asked to offer any opinions on patent law in this proceeding.

16. I have previously served as an expert in over 400 cases concerning computer technology. In particular, I have been involved in multiple cases involving electronic voting systems.

17. The statements made and opinions provided in this Declaration are based on my own personal knowledge and, if called as a witness, I could and would testify consistent with the following.

II. MATERIALS CONSIDERED

18. I have been asked by counsel for Petitioner to address the ineligibility and invalidity of claims 1-40 (the "Challenged Claims") of the '319 Patent.

19. I have reviewed the documents identified in Appendix 1 to this Declaration in forming the opinions expressed herein.

20. I have also relied on my education, skill, training, and experience in the relevant fields of technology, particularly electronic voting, in forming my opinions. I have further considered the viewpoint of a person of ordinary skill in the art as of the time of invention of the '319 Patent ("POSITA"). I provide my opinion as to the proper level of skill of a POSITA in Paragraphs 51-52 of this Declaration.

21. I reserve the right to supplement my opinions as expressed in this Declaration to address any new information obtained in the course of this proceeding, or based on any new positions taken by Petitioner.

III. COMPENSATION

22. I am being compensated at my standard consulting rate of $650/hour. My compensation is in no way dependent on the outcome of this proceeding and my compensation in no way affects the substance of my statements and opinions in this Declaration.

23. I have no financial interest in Patent Owner, Petitioner, or the '319 Patent. I also have had no contact with Patent Owner or Petitioner concerning this matter. I have only had contact with Petitioner's counsel.

IV. SUMMARY OF MY OPINIONS

24. I have been asked by counsel for Patent Owner to provide my opinions regarding whether the Challenged Claims of the '319 Patent would have been obvious in light of the art identified in the Petition and whether the Challenged Claims are drawn to well-known, routine, and conventional operations.

25. The following table summarizes the Grounds on which the Challenged Claims are challenged in the Petition:

Ground	Statutory Basis	References	Challenged Claims
1	35 U.S.C. § 101	Not Applicable	1-40
2	35 U.S.C. § 103	Brockhouse, Nadaf, and Schneier	1-20, 23-27, 29, 31, 34, 35, 39-40
3	35 U.S.C. § 112 Indefiniteness; Lack of Written Description; Lack of Enablement	Not Applicable	21, 22, 28, 30, 32, 33, 36-38
4	35 U.S.C. § 103	Brockhouse, Nadaf, Schneier, and Heilper	30, 32, 33, 36-38

26. After a review of the '319 Patent, the prosecution history of the '319 Patent, and the prior art references, and relying on my expertise in the field of electronic voting machines, it is my opinion that all of the Challenged Claims are

directed to the abstract idea of printing a vote record, verifying the accuracy of the printed vote record, and then tabulating the vote from the verified printed vote record, and thus do not constitute patent eligible subject matter under 35 U.S.C. § 101. It is also my opinion that Challenged Claims 1-20, 23-27, and 29-40 are invalid under 35 U.S.C. § 103. It is further my opinion that Challenged Claims 21, 22, 28, 30, 32, 33, and 36-38 are invalid under 35 U.S.C. § 112. My opinions, and the bases therefore, are detailed throughout this Declaration.

27. The '319 Patent descends, through a series of continuations, from U.S. Patent 10,445,966 (the "'966 Patent). The '966 Patent was the subject of PGR2020-00031 ("'966 PGR"), which determined all challenged claims unpatentable. I furnished an expert declaration in the '966 PGR.

V. LEGAL PRINCIPLES

28. Counsel for Petitioner has informed me of the legal principles that apply in this proceeding. The analysis and opinions provided in this declaration were developed in accordance with the following legal principles.

A. Patent Eligibility Under 35 U.S.C. § 101

29. It is my understanding that claims directed to laws of nature, natural phenomenon, and abstract ideas are not patent eligible.

30. Patent eligibility is determined using a two-step framework. Step one requires a determination of whether the claims are directed to one of the three

patent ineligible concepts identified above. If the claims are directed to a patent-ineligible concept, the analysis moves to the second step of identifying an 'inventive concept,' i.e., an element or combination of elements that is sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the ineligible concept itself.

31. I also understand that the United States Patent Office has published guidance regarding patent eligibility under § 101 and the Supreme Court's decision in *Alice*, specifically the "2019 Revised Patent Subject Matter Eligibility Guidance." (Guidance). The Office's guidance continues to be available in Sections 2103-2106.07 of the Manual of Patent Examination and Procedure ("MPEP"). *See* https://www.uspto.gov/patents/laws/examination-policy/subject-matter-eligibility.

32. Step 1 of the Guidance examines whether the challenged claims are directed to statutory subject matter: a "process, machine, manufacture, or composition of matter." MPEP § 2106(III).

33. If the claims are so directed, the analysis moves to Step 2A-Prong 1 to determine whether specific limitations in the claim under examination (individually or in combination) recite an abstract idea that falls within the subject matter groups of abstract ideas enumerated in Section I of the Guidance. MPEP § 2106.04. Those groups are: (a) mathematical concepts; (b) certain methods of organizing human activity; and (c) mental processes. MPEP § 2106.04(a).

34. The USPTO provided further guidance that "certain methods of organizing human activity" includes fundamental economic principles or practices, commercial interactions or legal interactions, and managing personal behavior or relationships or interactions between people. MPEP § 2106.04(a)

35. If the claims recite such an abstract idea, the analysis moves to Step 2A-Prong 2 to determine whether the claim as a whole integrates the recited judicial exception into a practical application of the exception by imposing a meaningful limit on the judicial exception, such that the claim is more than a drafting effort designed to monopolize the judicial exception. MPEP § 2106.04(II)(A). I understand that Step 2A Prong 1 and Prong 2 correspond to Step 1 of the *Alice* inquiry.

36. Exemplary considerations indicating that additional elements integrate the exception into a practical application include: whether the additional elements reflect an improvement in the functioning of a computer or other technology; use a judicial exception in conjunction with a particular machine that is integral to the claim; or otherwise use the judicial exception in some other meaningful way beyond generally linking the use of the judicial exception to a particular technological environment.

37. Elements that will not support eligibility include those that merely use a computer as a tool to perform an abstract idea; add insignificant extra-solution

activity to the judicial exception; or do no more than generally link the use of a judicial exception to a particular technological environment.

38. Finally, if the claims are directed to an abstract idea, Step 2B of the Guidance requires evaluation of the additional elements individually and in combination to determine whether they provide an "inventive concept that amounts to significantly more than the exception itself." MPEP § 2106.05.

39. I understand that it is insufficient for eligibility if the additional elements merely append well-understood, routine, conventional activities previously known to the industry, specified at a high level of generality.

B. Invalidity Under 35 U.S.C. § 103

40. Prior art to the '319 Patent includes patents and printed publications in the pertinent art that predate the priority date of the alleged invention(s) recited in the '319 Patent. I understand that the '319 Patent claims priority though various continuation applications to Provisional Application No. 62/711,212, filed on July 27, 2018.

41. A patent claim is invalid under 35 USC § 103 if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art. A claim may be found

obvious in view of a single prior art reference or from a combination of two or more prior art references.

42. When relying on a combination of prior art references to establish obviousness, it is necessary to show: (1) that the claim elements were known in the prior art; and (2) that a skilled artisan would have been motivated to combine these known elements.

43. To qualify as prior art for an obviousness analysis, a reference must qualify as "analogous art." A reference is considered analogous if it is from the same field of endeavor or is reasonably pertinent to the particular problem with which the inventor is involved. A reference is reasonably pertinent if it, as a result of its subject matter, logically would have commended itself to an inventor's attention in considering his problem.

44. The motivation to combine analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, but instead can take account of the inferences and creative steps that a person of ordinary skill in the art would employ. The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.

45. Certain secondary considerations may support or rebut the obviousness of a claim. I understand that such secondary considerations include,

among other things: (i) commercial success of the patented invention, (ii) skepticism of those having ordinary skill in the art at the time of invention, (iii) unexpected results of the invention, (iv) any long-felt but unsolved need in the art that was satisfied by the alleged invention, (v) the failure of others to make the alleged invention, (vi) praise of the alleged invention by those having ordinary skill in the art, and (vii) copying of the alleged invention by others in the field. There must be a nexus between any such secondary consideration and the alleged invention. Contemporaneous and independent invention by others is a secondary consideration tending to show obviousness.

46. I am not aware of any allegations by the named inventor of the '319 Patent or assignee that any secondary considerations tend to rebut the obviousness of any claim of the '319 Patent discussed in this declaration.

C. Invalidity Under 35 U.S.C. § 112

47. **Written description.** I understand that a patent must contain a written description of the subject matter claimed in the patent. The written description requirement is evaluated as of the date the patent was filed and is satisfied if a person of ordinary skill in the art reading the patent would recognize that the patent described the invention as claimed as of the date the patent was filed. I understand that the specification must include enough to convince a person of skill in the art that at the time the patent was filed the inventor possessed the full scope of the invention.

48. **Enablement.** For a claim to be enabled, the patent specification must teach those skilled in the art how to make and use the full scope of the claimed invention without undue experimentation. If the patent specification does not provide such an enabling disclosure of a claim, then the claim is invalid.

49. To determine whether undue experimentation would be required to practice the claims, the following factors may be considered: (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims.

50. A claim is not enabled if practicing the full scope of the claims would have required excessive experimentation, even if such experimentation would have been routine.

VI. LEVEL OF ORDINARY SKILL IN THE ART

51. The '319 Patent states at 1:23-26:

> The present disclosure relates to the voting systems for elections. More specifically, it provides a system and method for providing paper records of voter selections and generating cast vote records from those paper records.

The specification of the Patent discloses the use of bar codes and hash functions as mechanisms for verifying the content of a printed vote record that has been recognized through optical character recognition.

52. It is my opinion that a person of ordinary skill in the art at the time the '319 Patent was filed, in order to make and use the claimed inventions without undue experimentation, would have had at least a Bachelor's degree in electrical engineering or computer science or an equivalent field, or equivalent work experience and, in addition, at least two years' experience with electronic voting machines, including familiarity with ballot marking devices ("BMDs"), optical character recognition, bar codes and hash functions. This characterization was adopted by the Board in the '966 PGR. Ex. 1015 (PGR 2020-00031, Paper 29 (Sept. 1,2021)) at 6-7.

VII. TECHNOLOGY BACKGROUND

53. The '319 Patent is directed to electronic voting machines that incorporate known computer technology, such as scanners, printers, processors, optical character recognition, barcodes, and hash functions, to generate and confirm the accuracy and integrity of printed vote records ("PVRs") and cast vote records ("CVRs").

54. The '319 Patent does not disclose or claim any advances in these known technologies. Instead, it applied them in the technological environment of electronic voting machines, to which they have previously been employed. The Board previously held in a Final Written Decision in the '966 PGR that similar claims in the '966 Patent were unpatentable as anticipated and/or obvious to a

POSITA at the time of the invention over, among other references, two of the references asserted here, Brockhouse and Nadaf. See Ex. 1015 (PGR2020-00031, Paper 29 (Sept. 1, 2021)).

A. Electronic Voting Machines And Printed Vote Records Were Well Known in the Industry

55. Electronic voting machines that recorded a voter's vote selection, such as ballot marking devices ("BMDs"), were well known in the art long before the filing date of the '319 Patent. While mechanical ballot marking devices were known as early as the 1890s and punched-card ballot marking devices were known in 1962, true electronic BMDs were not introduced until the Help America Vote Act ("HAVA") in 2002 required voting systems used in elections for Federal office to be accessible to the disabled.

56. Since HAVA, the trend in the United States has been toward supposedly "voter-verifiable" voting systems. A paper ballot is voter-verifiable in the sense that the voter can check it for correctness before casting it. (The voter still has no assurance that the ballot will ever be counted, or, if counted, will be counted correctly.) By contrast, an old lever machine (whose use is now banned), was not voter-verifiable, and no record at all was made of a voter's choices. Instead, hidden counters associated with each candidate and question would be incremented by one for each choice made by the voter, but the voter could not see the counters and thus could not be certain that their vote was counted.

57. In the 1960s, electronic voting machines ("EVMs") began to replace lever machines. The first EVMs were also not voter-verifiable in any way. The EVM would keep hidden electronic counts analogous to the lever machine counters. The results of the count could be printed out at the close of the election, but a voter had no way to know whether their vote was actually counted.

58. The next development, and a crude step toward voter verifiability, was the paper trail. A printer was added to the EVM that would print out the voter's choices on adding-machine tape before any counters were altered. The voter could review the paper (but not touch it) to verify that the printed choices were accurate. A process was provided to correct the printout if anything went wrong. When the voter finally approved the printout, the voter could "cast" the vote. Then counters would be incremented AND the approved paper trail would be stored inside the machine. Theoretically, the paper trail would provide an audit record, and if there were any discrepancies between the computed results and totals obtained by manual counting of the paper trail the paper record, believed to be more reliable, would govern.

59. There were many problems with paper trails. Many paper trail printers failed or jammed, and in some cases (e.g., in California), the paper trail for a single voter could be six feet long, making review almost impossibly cumbersome.

60. The current era of BMDs followed HAVA. Instead of relying on hidden computer counters, the primary document became the paper ballot. Instead of having the voter mark the ballot with a pen and enter write-in candidates by hand, a computer is employed to guide the voter through the voting process and allow the voter to change their choices (which was very difficult to do with pen-marked votes). When the voter is satisfied with the choices, the BMD prints out a ballot marked properly with the voter's choices in a consistent manner (that is, independent of the voter's handwriting.) This voter-verified, printed ballot is called a "printed vote record" ("PVR") for obvious reasons.

61. The Board confirmed in its Final Written Decision in the '966 PGR that printed vote records (PVRs) bearing voter readable text indicating a voter's voting selection(s) were known in the art well before the earliest possible priority date of the '319 Patent. Ex. 1015 at 13-14 (discussing Brockhouse), 37-38 (discussing Nadaf). Sebes also discloses such PVRs, as does Provitola, which was filed in December 2000. Ex. 1025 at, *e.g.*, [086], [288] ("The ballot may take any of several forms, such as … a set of plain text representing choices; a document of plain text in an OCR friendly format; a bar code, QR code, or similar code that represents the selections; or multiple of these formulations."); Ex. 1047, Claim 1 ("print out the election ballot according to which the voter voted with the votes of the voter printed

thereon, so that the votes of the voter are readable on said election ballot by the voter and readable by a tabulating machine").

62. At this point, the ballot has been marked, but not yet counted. There are at least two methods of counting. In a first method, the voter who is satisfied with the printed ballot can "cast" it, meaning that the BMD will now read the choices, increment counters, and generate an electronic version of the ballot known as a "cast vote record" (CVR). It then stores the CVR and retains the paper ballot in a ballot box. In a second method, the BMD itself has no counting capability. Instead, the voter physically takes the printed ballot from the BMD to a "precinct ballot counter" ("PBC") and inserts it into a slot. The PBC "reads" the ballot via optical scanning and creates a CVR, which it stores.

63. The '319 Patent discloses both types of BMD, one in which the marking (BMD) and reading (Scanner) steps are performed by different units, as shown in Fig. 1, below.

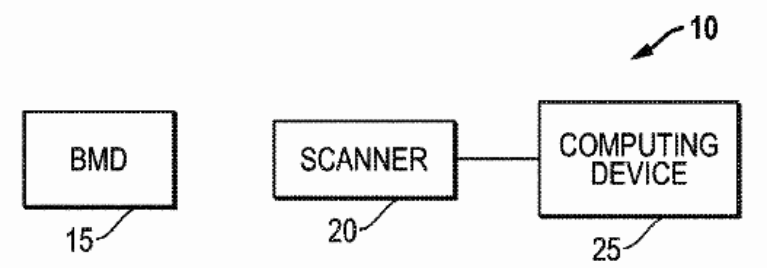


FIG. 1

However, the specification also states at 4:35-39 that "The BMD 15, scanner 20 and computing device 25 may each be separate non-integrated devices.

Alternatively, all or some of the functionality of these devices may be integrated together within one device."

64. Challenged Claims 1-28 and 34-40 are method claims. Challenged Claims 29-33 are system claims. All the Challenged Claims ostensibly read on both types of BMDs.

65. Ironically, the first electronic BMD was Petitioner's AutoMARK system, which is the subject of U.S. Patent No. 7,080,779 ("Cummings") (Ex. 1010), "Ballot Marking System and Apparatus," filed December 11, 2003. The Abstract of the '779 Patent reads:

> A terminal for marking a paper ballot which lists a plurality of candidates and which includes a marking space for each candidate which can be either hand-marked by a voter, or machine-marked by the terminal. The terminal scans the ballot to determine the ballot format, and then presents candidate selection options to the voter visually utilizing an LCD touch screen and aurally utilizing a synthesized speech menu. Candidate selections entered utilizing the touch screen menu or utilizing the audio menu are marked on the front and back sides of the ballot in marking spaces corresponding to the selected candidates, and the ballot is returned to the voter in a form which enables the voter to visually confirm that his or her selections have been marked. The ballot, whether hand-marked or machine-marked, is inserted in a ballot scanning device, wherein the ballot is tallied and deposited in a ballot box.

Ex. 1010 at Abstract.

66. Cummings not only marks the ballot, it also scans the ballot to read the markings.

67. The ‘319 Patent acknowledges that BMDs were known in the art in the Background of the Invention section of the specification:

> A variety of electronic voting systems are well known. Electronic systems include, for example, direct recording electronic (DRE) voting systems that electronically record votes to directly create an electronic cast vote record. **Electronic systems also include, for example, systems in which paper vote records are generated based on a voter’s electronic vote selections, with the paper vote record then being scanned for creation of the electronic cast vote record and electronic tabulation**.

Ex. 1001 at 1:27-35 (emphasis added).

B. Optical Character Recognition and Associated Error Correction Techniques Were Commonplace Prior to the Filing Date of the ‘319 Patent

68. Optical character recognition (OCR) is a computerized method for converting printed or handwritten text from an image into corresponding text, i.e. strings of character codes, such as ASCII codes. Ex. 1005 (U.S. 7,406,201 (“Heilper”)) at 1:13-41. OCR technology has been in use for decades. *See*, *e.g.*, Ex. 1011 (U.S. 3,609,685 (“Deutsch”)).

69. OCR technology has commonly been used for many years in numerous everyday applications such as data entry of business documents and converting printed documents to savable PDFs. OCR has also been used for ballot scanning at least since 1997. *See, e.g.*, Ex. 1012 (U.S. 6,250,548 (“McClure”)). McClure even provides for optical recognition of hand printed voter selections:

> The present absentee system is ideally suited to handle any hand printed write-in votes cast by a voter. The document scanner is designed to handle optical character recognition (OCR) and there is a variety of commercial software available for converting handwriting into an electronic image. If an absentee ballot 180 has a write-in vote (220), the scanning software call the OCR routine (222) that interprets the handwritten entry.

Id. at 32:42-49.

70. McClure even provides for a dictionary of sorts (in the form of a "list of approved write-in options") for assisting in character recognition:

> Depending on a jurisdiction's procedural requirements, the interpreted write-in is either compared to a list of approved write-in options (224), in which case an error message may be displayed (226), or just accepted.

Ex. 1012 at 32:49-53.

71. OCR processes, however, are inherently error-prone. For instance, the text within a scanned image may have touching, broken, distorted, or blurred characters that impair the accuracy of the data set generated from the OCR process. Ex. 1013 (U.S. 5,764,799, "Hong") at 1:19-26.

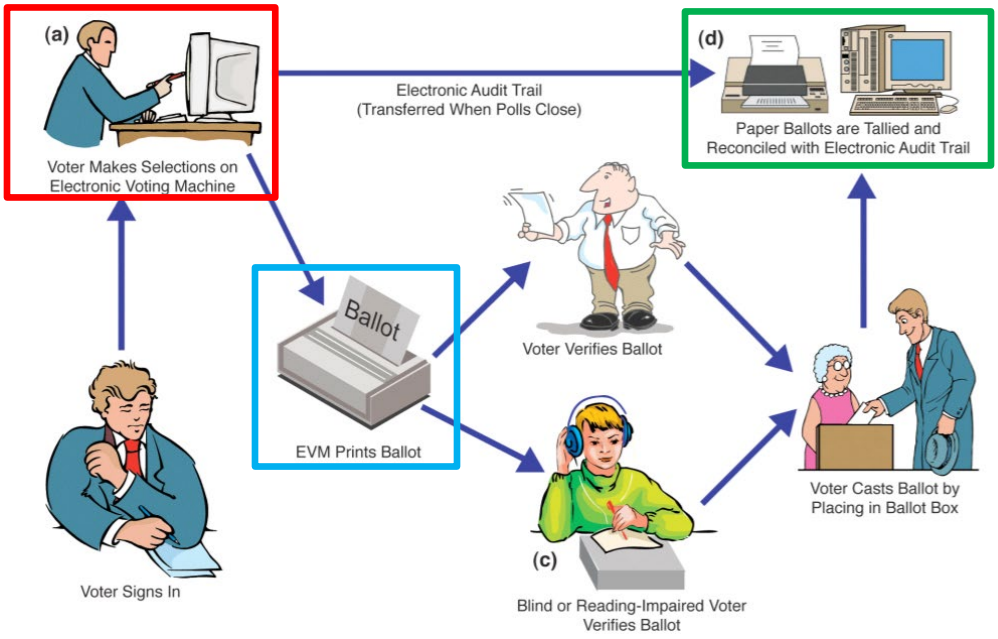
72. Because such errors are common in the OCR process, error correction steps have long been applied to improve the accuracy of OCR processes, particularly in applications in which accurate text recognition is critical. Ex. 1005 at 1:13-41; Ex. 1014 (U.S. 9,361,531 ("Stella")) at Abstract.

73. Electronic voting methods incorporating OCR technology have been known and used in electronic voting applications for decades. For example, Keller

et al. in 2005 disclosed an electronic voting machine on which a voter's voting selections were recorded and a PVR of those selections was created. Ex. 1019 ("Keller") at 169, 170.

74. The PVR created by the electronic voting system of Keller contained the voting selections in "human readable text" using an "OCR-friendly font." *Id.* That PVR was subsequently scanned and OCR processes were used to recognize and record the voter's voting selections. *Id.*

75. A graphic of the method and system disclosed by Keller et al. is shown below with the recording of the voter's voting selections highlighted in red, the generation of a PVR highlighted in blue, and the scanning and OCR of the PVR highlighted in green:



Id. at 174.

76. U.S. Patent Application Publication 2019/0213820 ("Sebes"), published July 11, 2019, also disclosed voting equipment that: (1) generated a PVR bearing the voter's voting selections in voter readable text and/or in a barcode, (2) scanned the PVR, (3) performed OCR processes on the voter readable text, (4) determined if the text recognized using OCR matched a ballot option in the "election definition," and, (5) if there was a match, generating a CVR from the OCR dataset. Ex. 1025 at [0086], [284], [286]-[289], [310], [312], [325].

77. Numerous other examples of electronic voting machines using OCR processes were known prior to the earliest possible filing date of the '319 Patent. *See*, *e.g.*, Ex. 1004 (U.S. App. 2014/0231513 ("Brockhouse")) at [0134]; Ex. 1020 (U.S. 5,377,099 ("Miyagawa") at 8:45-9:16; Ex. 1021 at 98; Ex. 1022 (U.S. App. 2006/0041468 ("Reardon")) at [0036]; Ex. 1023 (U.S. App. 2009/0166417 ("Dammann")) at [0049]-[0050]; Ex. 1024 (U.S. App. 2009/0289115 ("Chung")) at [0098]; Ex. 1026 (U.S. 7,306,148 ("Morganstein") at 7:20-23.

C. Barcodes

78. The use of barcodes to represent information is ubiquitous. Such barcodes have been known since at least as early as 1949, when Norman Joseph Woodland and Bernard Silver filed their patent application that later issued as U.S. Pat. No. 2,612,994. Ex. 1028 (U.S. 2,612,994).

79. Barcodes encode data into a visual, machine-readable format that can be read easily and unambiguously by an optical scanner. One-dimensional barcodes encode data in a series of parallel lines with varying widths and spacing. One-dimensional barcodes became commercially successful in the 1970s when Universal Product Codes (UPC codes) were used to automate checkout-counter transactions in supermarkets and stores.

80. Two-dimensional, or matrix, barcodes provide information storage on both horizontal and vertical axes. Such barcodes can store considerably more data than one-dimensional barcodes. Ex. 1029 (U.S. 5,726,435) at 1:15-28. The Quick Response (QR) code is a specific type of two-dimensional barcode that was developed in 1994 by the Toyota subsidy Denso Wave. Ex. 1030 (Ashford) at 2.

81. QR codes, such as the example that follows, consist of black squares arranged in a square grid on a white background, as shown below.



Ex. 1031 (Barrera) at 4.

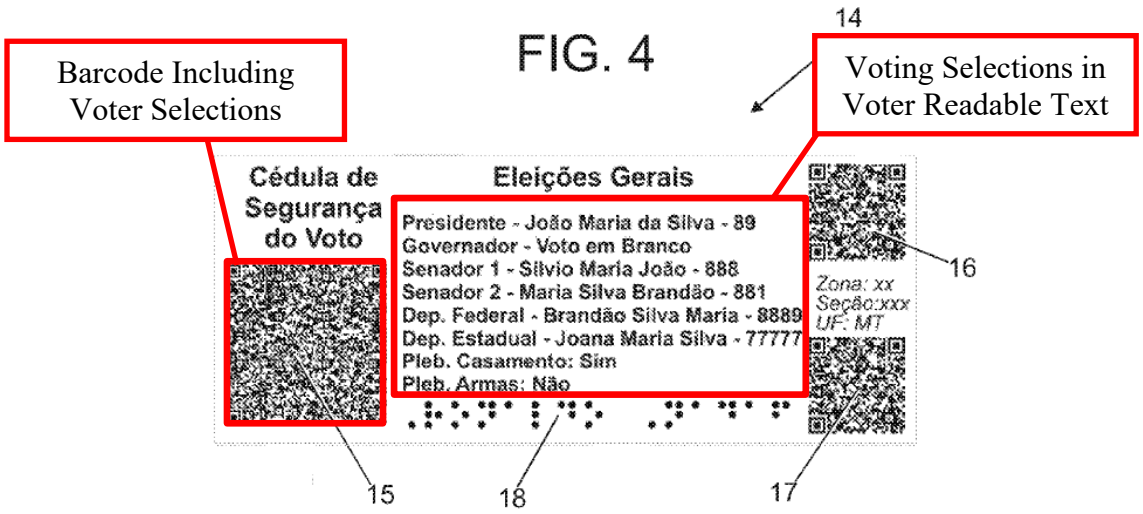
82. QR codes are robust in several ways. Notice that three (but not four) corners of the above QR code have a special black square within a square. These

three markers permit the QR code to be read in any orientation. Furthermore, QR codes contain redundant information so that the code can be interpreted properly even if a single pixel is read incorrectly. Because of their robustness, compactness and ease of printing, QR codes have since gained substantial mainstream popularity. Ex. 1030 at 2; Ex. 1031 at 4.

83. As the '319 Patent recognizes, prior art electronic voting machines incorporated barcodes for storing information on a PVR related to a voter's voting selections. Ex. 1001 at 1:46-55.

84. As an example, the electronic voting machine disclosed by Keller in 2005, printed a barcode on the PVR that contained the voter's voting selections. Ex. 1019 at 168-170. Keller further teaches that a voter would take the PVR bearing the barcode to a Ballot Reconciliation Station where the barcode would be decoded and the human readable text would be OCR'd. *Id*. at 170 ("Ideally, the Ballot Reconciliation System reads the OCR text of the ballot as well, not just the barcode. The barcode consists of several things: … • The selections made by the voter ….").

85. Another example of a PVR containing a barcode (in the form of a QR code) in which the voter's voting selections are encoded can be found in Nadaf (BR102013018558) as shown in the image that follows:



Ex. 1007[1] at Fig. 4.

86. Numerous other examples can be found in the prior art. Ex. 1032 (U.S. App. 2010/0114674) at [0076]; Ex. 1022 at [0044]; Ex. 1033 (U.S. 9,165,417) at 2:58-62, Fig. 1, Fig. 2; Ex. 1034 (U.S. App. 2014/0012635) at [0023], [0033]; Ex. 1004 at [0055]; Ex. 1035 at (U.S. 10,002,481) at 2:33-50; Ex. 1036 at (U.S. 10,147,259) at 3:48-61.

D. Using Hash Functions to Create Self-Authenticating Documents Was Well Known

87. In computer science, a hash function is any algorithmic function that converts data of an arbitrary size into fixed-size values. Ex. 1037 (WO 01/20562) at 16:22-24. The fixed-sized output values resulting from hash functions are

[1] Unless otherwise stated, citations to Nadaf in this Declaration are made to the translation of BR102013018558A2 provided by Robert Sette (Ex. 1007), which was provided by Patent Owner to the U.S. Patent Office.

interchangeably referred to under a number of labels, including: hashes, hash numbers, hash values, hash codes, or message digests.

88. If anything can be considered antique in the field of computer science, the hash function would qualify. It was invented in 1953 by Hans Luhn of IBM. Writing in 1996, Bruce Schneier described hash function already at that time as having "been used in computer science for a long time." He wrote:

> A hash function is a function, mathematical or otherwise, that takes a variable-length input string (called a pre-image) and converts it to a fixed-length (generally smaller) output string (called a hash value). … The point here is to fingerprint the pre-image: to produce a value that indicates whether a candidate pre-image is likely to be the same as the real pre-image.

Ex. 1009, 30.

89. There are a number of different hash functions that have been developed, many of which have been widely known for decades. Ex. 1038 (Krawczyk) at 1. A defining characteristic of any hash function is that it always provides the same output for a given input. Ex. 1039 (Essex) at 19.

90. Conversely, when an altered or different input is entered into the hash function, the hash function will result in a different output or hash value. Ex. 1009 at 30-31; Ex. 1039 at 19; Ex. 1038 at 4-5. A common use of such hash values is as a checksum for confirming that two sets of data are identical. Ex. 1040 (U.S. App. US 2018/0102013) at [0100].

91. The use of hash functions to protect the integrity of a document and its contents was common in the art long before the filing of the '319 Patent. For example, the Network Working Group published an article discussing the use of a keyed-MD5 hash mechanism (called HMAC-MD5) for use as a message authentication code or integrity verification check in 1997—over 20 years before the filing of the '319 Patent. Ex. 1038 at 1.

92. Hash functions have also long been used to create digital signatures for authenticating documents. In such applications, a hash function can be used to generate a hash value based on the content of the document. Ex. 1041 (U.S. 7,729,991) at 5:6-9. The hash value is then encrypted and acts as a digital signature that is appended to the document. *Id*. at 5:12-15. The receiver uses the same hash function to calculate a hash value from the content of the document as received. *Id*. at 5:16-19. The hash value as calculated by the receiver is then compared to the decrypted hash value from the digital signature. *Id*. at 5:21-24. As even the slightest change to the electronic document (*e.g.* a single bit) would result in a different hash, the electronic document is authenticated where the hash value as calculated by the recipient matches the hash value as provided in the digital signature. *Id*.

93. Hash functions have long been used for security purposes in the context of electronic voting. For example, hash functions have been used for: (1)

verifying that voting system software has not been tampered with (Ex. 1042 (WO 04/038632) at 10:14-23); (2) confirming that actions performed on voting machines by poll workers are authorized (Ex. 1043 (U.S. App. 2011/0202464) at Abstract); (3) voter authentication (Ex. 1025 at [0148]-[0149] and Ex. 1044 (U.S. 6,873,966) at 3:9-13)); and (4) verifying the authenticity of ballots (Ex. 1037 at 33:4-13).

94. Numerous other examples of hash functions being used to verify the authenticity of a ballot exist in the prior art. For example, Rodriguez et al. (U.S. 7,729,991 (Rodriguez) (Ex. 1041) and U.S. Pat. No. 9,401,059 ("Backert") (Ex. 1008) each disclose the use of hash functions to provide a digital signature on completed electronic ballots to verify that the electronic ballots are intact and have not been changed. Ex. 1041 at 5:6-24, and Ex. 1008 at 10:65-11:13. Further, U.S. Published Patent Application No. 2018/0102013 (Spanos) (Ex. 1040) discloses adding checksums to electronic voting records while scanning printed ballots "in order to expedite audit and validation" of the ballots. Ex. 1040 at [0100].

95. Nadaf teaches use of an Elliptic Curve Digital Signature Algorithm (ECDSA) to provide a hash of the voter's voting selections that is used to authenticate the PVR and confirm the accuracy and integrity of the PVR. Ex.1007 at 5:10-15, 14:15-19, 19:7-9. *See also* Ex. 1046 at 38: "6.4 ECDSA Digital

Signature Generate and Verification … An approved hash function, as specified in FIPS 180, shall be used during the generation of digital signatures.").

VIII. THE '319 PATENT AND THE CHALLENGED CLAIMS

A. The Specification of the '319 Patent

96. The '319 Patent describes methods for electronic voting using optical character recognition ("OCR") of printed vote records ("PVRs").

97. The '319 Patent recognizes that prior art electronic voting systems used paper records to create a paper trail of voter selections. Ex. 1001 at 1:42-43. Such systems provided a "printed vote record" that was "scanned on a digital scanner for cast vote record creation." *Id*. at 1:46-50. These prior art systems further included a barcode on the PVR that was "encoded with the voter's vote selections." *Id*. at 1:52-59. This barcode could be read and decoded to generate an electronic cast vote record (CVR). *Id*.

98. Such prior art systems, according to the '319 Patent, could be problematic because "some voters may find such a process to lack transparency as the voter cannot readily review the barcode to confirm the encoded data matches the voter's vote selections." *Id*. at 1:54-59. Thus, according to the '319 Patent, it "would be desirable to provide an electronic voting system that utilizes PVRs in a manner that provides better transparency to the voter." *Id*. at 1:60-62.

99. The '319 Patent purports to address this perceived problem by including in the PVR voter readable characters (*e.g.* the selected candidates' names), which themselves are subsequently scanned and OCR'd to create a cast vote record. Ex. 1001 at 1:66-2:10. The voter can then rely on the fact that the selections that are verified are the ones actually counted. Fig. 1 of the '319 Patent provides "[a]n exemplary system" ("voting system 10") of the purported invention:

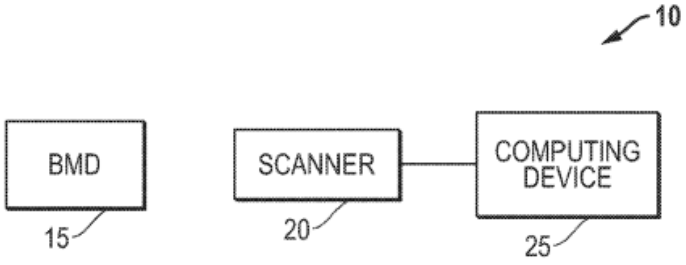


FIG. 1

Id. at Fig. 1; 3:66-4:5.

100. As in prior art electronic voting methods, the process discussed in the '319 Patent begins with the voter making her voting selections using known voting systems such as a ballot marking device ("BMD"). *Id*. *See also id*. at Fig. 1, Reference 15. When the voter has completed making her voting selections, the BMD prints a PVR containing those selections in voter readable characters. Ex. 1001 at 1:66-2:10. *See also id.* at 4:58-59 ("In operation, a voter uses the BMD to generate a PVR.").

101. The '319 Patent discloses an "exemplary embodiment" of such a PVR in Figure 3:

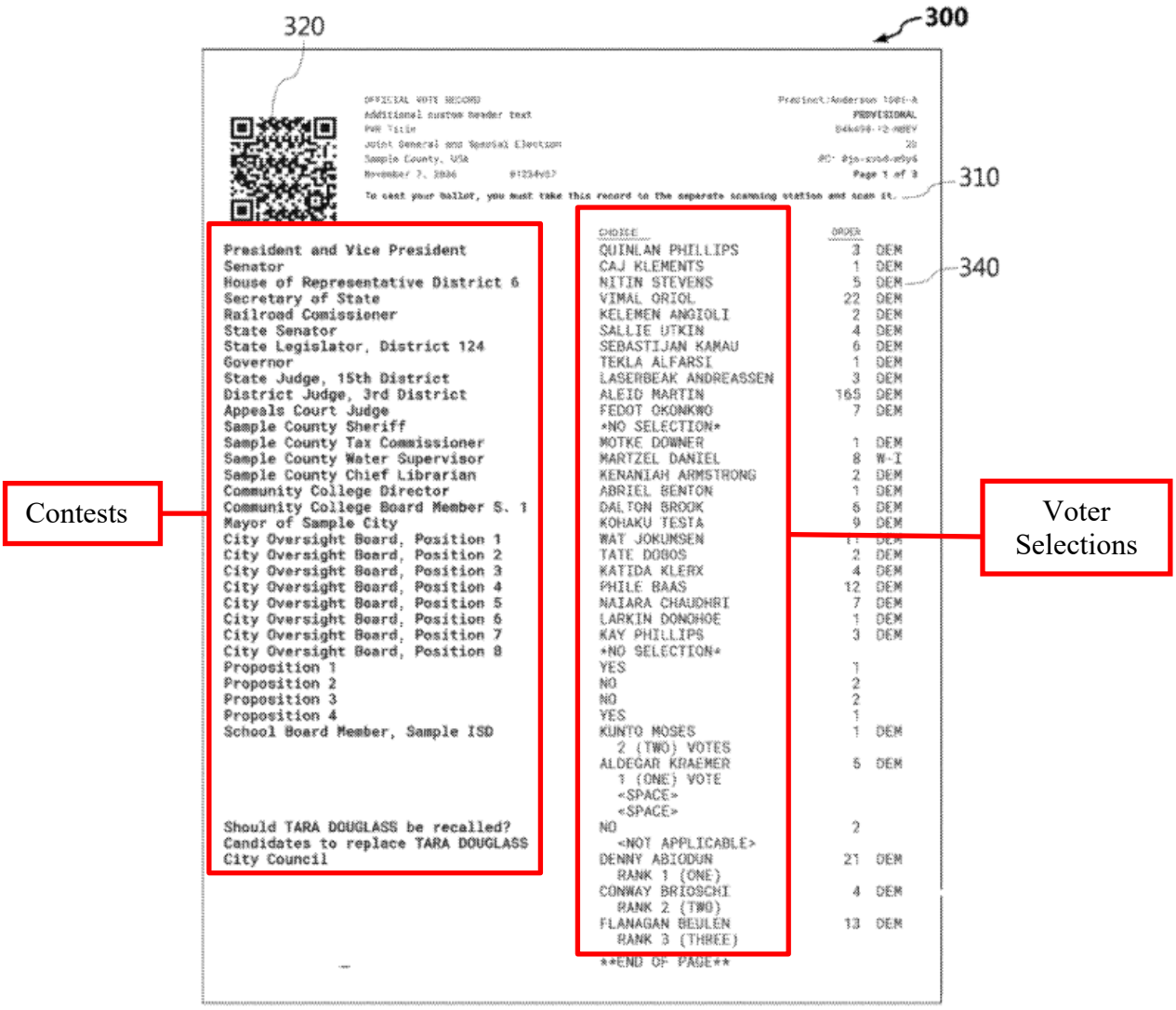


FIG. 3

102. In this embodiment, the various voting contests are listed in the "contest section 330" on the left-hand side of the PVR. *Id*. at 6:35-50 (The numeral "330" does not appear in Fig. 3, but refers to the red rectangle at the left). The voter's selection for each contest is printed on the right-hand side in the

"selection section 340." *Id*. The numeral "340" in Fig. 3 appears to point only to a party abbreviation, but in fact refers to everything from the right-hand red rectangle to the right edge of the ballot. All of this information is printed in voter readable text so that the voter can verify the accuracy of the PVR. *Id*. at 6:51-55 ("As seen in Fig. 3, the voter selections are provided in a character form that is readable by the voter. Thus, voting transparency is provided to the voter such that the voter can confirm the PVR matches the selections entered by the voter on the BMD"); *see also id.* at 4:12-16.

103. After verifying the accuracy of the PVR, the voter inserts the PVR into a scanner. *Id*. at 4:16-30. The scanner uses "conventional scanning hardware" to create a scanned image of the PVR and provides that scanned image to a "computing device" connected to the scanner. *Id*.; *see also id*. at Fig. 1.

104. The "computing device" can then use OCR processes on the scanned image to generate a data set representing the voter's voting selections. *Id*. at 2:2-10; 2:59-62; 4:51-61. This OCR data set is used to generate a cast vote record ("CVR"); *Id*. at Abstract; 2:4-5.

105. The '319 Patent also states that the computing device may use conventional OCR error correction procedures that were well known in the computer sciences, such as use of dictionaries and/or long string matching

algorithms (such as the Levenshtein algorithm first published in 1966), to account for and correct potential OCR errors. *See id*. at 5:18-52.

106. The '319 Patent states that use of these known OCR and error-correction procedures provides a "what you see is what you get" PVR to the voter that is used to generate the cast vote record. *Id*. at Abstract. *See also id.* at 1:66-2:10.

107. The '319 Patent states that the PVR may include a bar code that can be used to "ensure the PVR is valid and/or has not been altered after printing." *Id*. at 2:43-48. As the '319 Patent acknowledges, printing bar codes containing voting selections on a PVR was known in the voting machine industry before the priority date of the '319 Patent. *Id*. at 1:53-55.

108. The bar code discussed in the '319 Patent can also include a "single digitally signed hash that may be generated using a secure hash function to indicate the PVR is valid and a one way hash of the voter's vote selections." *Id*. at 6:8-14. This hash is used in a conventional manner to verify that the PVR has not been altered since being printed.

109. A hash of the OCR data set generated from the scanned image of the PVR may be compared to the hash in the barcode to confirm that the PVR was generated on an authorized voting machine and that the PVR has not been altered. *Id*. The '319 Patent further discloses that the bar code can be printed on the PVR

in any of a wide range of commonly known barcode types, such as a 1-D barcode or a 2-D barcode, such as a QR code. *Id*. at 6:27-34.

110. The '319 patent does not disclose or claim any new OCR techniques or advances over then-existing OCR techniques.

B. Summary of the Challenged Claims

111. The '319 Patent contains four independent claims (claims 1, 15, 29, and 34) and twenty-six dependent claims. Claim 29 is representative, and reads (emphasis added):

> 29. An electronic voting system for using printed vote records, comprising;
>
> **a printer configured to generate** a printed vote record of at least one vote selection of a voter, the printed vote record including voter readable text indicating the voter's at least one vote selection;
>
> **a scanner configured to** (1) electronically capture first information from the printed vote record, the first information including the voter readable text, and (2) electronically capture second information from the printed vote record, the second information comprising encoded data; and
>
> **a processor configured to** (1) use optical character recognition (OCR) on the first information to generate a first data set based at least in part on the voter readable text indicating the voter's at least one vote selection, (2) generate a cast vote record which is to be a stored record of all of the voter's final vote selection indicating the voter's at least one vote selection based on the first data set and which is to be the voter's casted vote used for vote tabulation, and (3) generate a second data set from the second information, and
>
> wherein, **the processor is further configured** such that prior to generating the cast vote record which is to be a stored record of

> all of the voter's final vote selections and to be used for vote tabulation, an accuracy of data to be cast is confirmed based at least in part on a comparison of the first data set and the second data set.

112. Claim 29 recites only generic computer components performing conventional processes: (1) a printer that prints a document (a printed vote record or "PVR" bearing at least one voter selection), which is what printers do; (2) a scanner that electronically captures information from the PVR, which is what scanners do; and (3) a processor that (i) performs an OCR process on the captured information, which is what OCR does; (ii) generates and compares the data sets (a conventional verification process) and (iii) generates a (conventional) cast vote record (CVR).

113. The remaining independent claims 1, 15, and 34 are method claims that essentially recite the steps performed by the electronic voting system of claim 29, as can be seen in the side-by-side listing of the Independent Claims in Appendix B. These independent method claims generally require the steps of: (1) generating (*e.g.* printing) a PVR bearing voter readable text indicating at least one vote selection; (2) electronically capturing (*e.g.* scanning) first and second sets of information from the PVR; (3) OCR'ing the first set of information to generate a first data set; (4) comparing the two data sets; and (5) generating a cast vote record (CVR) indicating the at least one vote selection. Steps (3)-(5) above correspond to the "processor configured to" limitations of claim 29. Independent Claim 15 also

requires that the second data set be generated from second information electronically captured from the PVR and that the second information include encoded data. Encoding voter selection data was conventional, and makes reading a ballot easier. Claim 34 further requires that the accuracy of the at least one vote selection be confirmed at least in part on a comparison of the first and second data sets and that the election be tabulated using the CVR before vote auditing. These are conventional steps of vote verification and tabulation.

114. Claims 2-14 depend from claim 1. Claim 2 adds that the PVR includes encoded data based at least in part on the voter's vote selection and that the second data set is generated at least in part from the encoded data. The encoding of voter ballots, for example, in a bar code, was conventional. Claim 3 depends from Claim 2 and adds that the electronically capturing information step of Claim 1 includes capturing the encoded data of Claim 2. There is no point in encoding data if it is not subsequently to be captured. Claim 4 requires that the electronically capturing information step include scanning the voter readable text. Scanning is a conventional way of "capturing" data. Claim 5 effectively combines the limitations of claims 2-4. Claim 6 depends from Claim 5 and requires that the encoded data be contained in a visual representation of encoded data.

115. Claim 7 requires the information captured from the PVR to include voter readable text indicating at least one vote selection and unspecified "other

information." It is purely conventional to capture a vote selection – that is what tabulating ballots is all about. Further, the inclusion of unspecified "other information" for no claimed purpose does not create a patentably distinct invention. Claim 8 depends from Claim 7 and requires the "other information" to be contained in a bar code. As explained above, encoding voting information in a bar code was conventional. Claim 9 depends from Claim 7 and requires the second data set to be based at least in part on the "other information."

116. Claim 10 requires that electronically capturing information in claim 1 includes capturing an image of the PVR.

117. Claim 11 requires that the CVR be the sole casted[2] vote used for tabulation. (Presumably this means that the CVR is the only record used for tabulation, but this is conventional since the whole purpose of the CVR is for tabulation.) Claim 12 depends from Claim 11 and requires that the information captured from the PVR include voter readable text indicating the voter's vote selection and "other information." That is conventional because the very purpose of the PVR is to record voter readable text. Claim 13 depends from claim 12 and, similar to claim 8, requires the "other information" be contained in a bar code. As

[2] I am troubled by the use of the word "casted" in the claims because I do not understand it to be an English word. The past tense and past participle of "cast" are also "cast." Therefore, I have understood "casted," as used in the '319 Patent, to mean "cast."

explained before, encoding ballot information in a bar code was conventional. Claim 14 also depends from claim 12 and, similar to claim 9, requires that the second data set be based at least in part on the unspecified "other information."

118. Claims 16-28 depend from Claim 15. Claim 16 requires that the "encoded data" be contained in a "visual representation" on the PVR. This is conventional because if the "encoded data" were not contained in a "visual representation" on a paper ballot, it could never be read (because it would not be "visual"). Claims 17, 18, 24, and 25 require the use of a hash function to confirm the accuracy of the OCR process. As explained above, the use of hash functions for verifying accuracy was conventional. Claims 19 and 26 require that the accuracy of the OCR process be confirmed by comparing the voting selection(s) in the first data set to the second data set. That is conventional because it is the very essence of "verification." Claims 20 and 27 require that the CVR be based on the OCR (first) data set. Claim 23 requires using the CVR to tabulate the vote. That is conventional because that is the whole purpose of a CVR.

119. Claim 31 depends from claim 29 and requires the use of a hash function to compare the OCR data set to the encoded data on the PVR. This is just the conventional use of hash functions for verification.

120. Claims 35, 39, and 40 depend from Claim 34. Claim 35 requires use of a hash function to compare the data sets, which is a conventional use of hash

functions. Claim 39 requires using the PVR to audit the election, and claim 40 requires using the CVR for tabulation. Auditing an election from PVRs is conventional because auditing is typically done by humans, and they must be able to read the ballot. Because CVRs are digital, humans cannot read them. The very purpose of CVRs is for tabulation, so the limitation of claim 40 is purely conventional.

121. Claims 21, 22, 28, 30, 32, 33, 36, 37, and 38 require "recursively modifying" an OCR process or the "first data set," concepts that are not disclosed anywhere in the written description of the '319 Patent. Rather, "recursively modifying" is a term that appears only in these dependent claims. As explained below in the section on § 112, these claims lack written description and are not enabled. Nevertheless, whatever meaning can be ascribed to "recursively modifying," the '319 Patent does not disclose any new, or improvements to old, "recursively modifying" techniques.

C. Prosecution History of the '319 Patent

122. The '319 Patent issued from Application No. 18/381,091 which was filed on October 17, 2023. As originally filed, the '091 Application contained 40 claims. Ex. 1002 at 20-27.[3]

[3] Citations to the file history for the '319 Patent and to the file history for U.S. App. No. 17/483,627 (Ex. 1016) are to the added exhibit page numbers. As noted

123. On May 8, 2024, the examiner issued a non-final office action rejecting original claims 1-40 on the ground of nonstatutory double patenting over claims 1-44 of the applicant's U.S. Patent 11,830,294 in view of McDermott U.S. Patent Application Publication 2002/0072961. *Id.* at 251-69.

124. On May 31, 2024, the applicant's only amendment was to amend original claim 1 (which became issued claim 1) by adding at the end of the step "comparing the first data set to a second data set" the words "the second data set obtained from the printed vote record." The applicant also filed a terminal disclaimer to address the double patenting rejection. *Id.* at 275-76.

125. On July 4, 2024, the examiner allowed claims 1-40. *Id.* at 309-13.

126. The '319 Patent claims priority to six continuation applications and ultimately to Provisional Application No. 62/711,212, filed on July 27, 2018. During prosecution of one of those continuation applications (Application No. 17/483,627, "the '627 Application"), PO asserted that claims similar to the Challenged Claims were patentable over Brockhouse and Nadaf. EX1016, 112-123. More specifically, the claims at issue in the '627 Application, like the Challenged Claims here, generally included a temporal limitation requiring that the CVR be generated after a comparison of the first and second datasets and that the

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above, citations to Nadaf are to the translation provided in Ex. 1007. Citations to all other exhibits are to the original page numbers.

CVR be used for tabulating the election. *See id*. at, *e.g.*, 72. PO asserted that such claims were distinguishable from Nadaf because the CVR generated by Nadaf's Equipment 19 after the "comparative audit" was not the CVR used to tabulate the election. *Id.* at 120.

127. A POSITA would have known, long before the earliest possible priority date of the '319 Patent, that the data used to audit an election must be as reliable and accurate as the data used to tabulate the election.

128. At the time of the earliest filing date of the '319 Patent, the U.S. Election Assistance Commission, which was established under HAVA and empowered to issue voting system guidelines, in fact issued such guidelines. The guidelines in effect at the time of the Patent were the "2015 Voluntary Voting System Guidelines. Version 1.1" (the "VVSG"). Ex. 1017. While adoption of the VVSG by the states is voluntary, voting system manufacturers in reality conform to the VVSG to be able to sell their products.

129. The VVSG contain detailed provisions for the auditing of an election In fact, the term "audit" appears in the VVSG 111 times. In the VVSG, auditability of an election is as important as tabulation. The VVSG require:

> **2.1 Overall System Capabilities:** These functional capabilities apply throughout the election process. They include security, accuracy, integrity, s**ystem auditability,** election management system, vote tabulation, ballot counters, telecommunications, and data retention.
>
> …

> **2.1.5 System Audit**
> This subsection describes the context and purpose of voting system audits and sets forth specific functional requirements. **Election audit trails provide the supporting documentation for verifying the accuracy of reported election results**. They present a concrete, indestructible archival record of all system activity related to the vote tally, and are essential for public confidence in the accuracy of the tally, for recounts, and for evidence in the event of criminal or civil litigation.
>
> These requirements are based on the premise that system-generated creation and maintenance of audit records reduces the chance of error associated with manually generated audit records. Because most audit capability is automatic, the system operator has less information to track and record, and is less likely to make mistakes or omissions. The subsections that follow present operational requirements critical to acceptable performance and reconstruction of an election.

Ex. 1017 at 22, 25 (emphasis added).

130. I note that, in making its temporal argument to the Examiner of the '627 Application, PO asserted that Petitioner had stated "as recently as April 2019" in a "letter to sitting U.S. Senators that no voting system could 'use OCR to read [a candidate's name] and record a vote reliably[.]" Ex. 1016 at 113-14. I also note that the Board in the '966 PGR rejected similar arguments raised by PO regarding Petitioner's April 2019 Letter. Ex. 1015 at 24-26 ("Patent Owner asserts that, '[u]ntil at least April 2019, [Petitioner] maintained publicly that OCR could not be relied on in voting machines, in part because of situations where two candidates have the same or similar names.'… [W]e disagree with Patent Owner's characterization of ES&S's comments in its letter"), 33 ("…Patent Owner

mischaracterizes ES&S's letter."). I agree with the Board's ultimate finding that PO was incorrect, and that the "industry, or at least ES&S, used OCR in the voting process" and that "ES&S's response explains that barcodes can be used to determine how to count the vote after a name is recognized by OCR." *Id*., 25, 27. As explained in the Technology Background Section of this Declaration, others also developed and/or disclosed voting machines using OCR in the voting process. Ex. 1019 (Keller) at 169, 170; Ex. 1025 (Sebes) at [0086], [284], [287]-[289], [310], [312], [325].

IX. CLAIM CONSTRUCTION

131. It is my understanding that claims in a PGR are given the meaning that the term would have to a person of ordinary skill in the art in question at the time of the application. For purposes of this declaration, I have used the earliest possible priority date, the filing of Provisional Application No. 62/711,212 on July 27, 2018.

132. **Cast vote record.** The '319 Patent specifically defines the claim term "cast vote record":

> As used herein, an electronic cast vote record is an electronic record that indicates the determined voter's choice or selection in a manner determined in accordance with the voting system. Thus, an electronic cast vote record is an electronic record of a voter's cast voting selections and *may be used* in the vote tabulation process.

Ex. 1001 at 1:35-40 (emphasis added).

133. Because the '319 Patent makes clear that, while the cast vote record may be used in the vote tabulation process, one of ordinary skill in the art would recognize that such use is not required. Such an understanding is consistent with how the term "cast vote record" has generally been used in the pertinent art. *See*, *e.g.*, Ex. 1045 (*Electronic Voting Glossary*) (defining "cast vote record" as a "permanent record of all votes produced by a single voter whether in electronic, paper or other form. Also referred to as BALLOT IMAGE when used to refer to electronic ballots. … An 'archival record of all votes produced by a single voter'.").

134. Consistent with the lexicography in the '966 Patent, of which the '319 Patent is ultimately a continuation, the Board in the '966 PGR construed "cast vote record" to mean "record that indicates the determined voter's choice or selection in a manner determined in accordance with the voting system." Ex. 1015, 7-10.

135. **Recursively modifying.** Claims 21, 22 (by dependency), and 28, all include the phrase "recursively modifying an OCR process applied to the voter readable text." Claims 30, 32, 33 all contain the phrase, "wherein the processor is configured to recursively modify the first data set." Claims 36-38 contain the phrase "recursively modifying the first data set." I will refer to all of these claims collectively as the "Recursive Claims."

136. The term "recursively modifying" did not appear in the claims of the '966 Patent and has not previously been construed. It is not used or defined in the '319 Specification. I understand, therefore, that it is to be given its plain and ordinary meaning to a POSITA.

137. The plain and ordinary meaning of "recursive" and "recursively" can be gleaned from multiple dictionaries.

138. There is overwhelming agreement in authoritative dictionaries and textbooks that a "recursive" process or procedure is one that calls itself. For example, the function definition

a(1) = 1; a(n) = 2 a(n-1);

is a simple recursive definition of the series 1, 2, 4, 8, 16, …, i.e., the powers of two. The "recursive" part is the fact that in order to calculate a(n) one must first calculate a(n-1). Thus the function calls itself.

139. The *Microsoft Computer Dictionary* (2002) gives only one definition of "recursion": "*n*. The ability of a routine to call itself. Recursion enables certain algorithms to be implemented with small, simple routines, but it does not guarantee speed or efficiency." Ex. 1049.

140. Barron's *Dictionary of Computer and Internet Terms* (10th. Ed., 2009) also gives only one definition of recursion: "the calling of a procedure by itself, creating a new copy of the procedure." Ex. 1050.

141. Rigdon's *Dictionary of Computer and Internet Terms* (1st edition 2016) defines recursion as "(n)~ The ability of a routine to call itself." Ex. 1051.

142. The Mozilla Glossary[4] defines recursion as "The act of a function calling itself, recursion is used to solve problems that contain smaller sub-problems. A recursive function can receive two inputs: a base case (ends recursion) or a recursive case (resumes recursion)." In the function example above, "a(1) = 1;" is the base case; "a(n) = 2 a(n-1)" is the recursive case.

143. In the field of voting, "recursively modifying" is uncommon, but not completely unknown. Kincaid U.S. Patent Application Publication US2015/0279139A1 (Ex. 1052 ("Kincaid")), entitled, "Systems and methods for providing distributed recursive voting," discloses a recursive voting method, but having nothing to do with OCR or modifying datasets:

> The Global Reach of Recursive Voting—With today's technology, a single email is sent and resent and can eventually end up arriving in millions of different inboxes. This principle can affect the reach of the End User Voting Tool if security concerns are put aside for a second. Imagine that the user interface of the End User Voting Tool includes a checkbox to allow recursive voting; when this feature is selected, users receiving an initiative have the ability to forward it on to a user list of their own choosing. Those users in turn would be able to forward it on to users of their choosing and so on. In this manner, it's possible for an initiative to spread out to vast numbers of people within a few iterations of the process. For example, if you ask people to respond to an initiative, and they in turn each ask more people—a process that continues for cycles—the initiative in question will reach ten billion people—more than the population of our globe and far

[4] Available at https://developer.mozilla.org/en-US/docs/Glossary/Recursion.

> more than the practical limits of the number of people who would have access to the appropriate technology to participate in this voting tree.

Ex. 1052 at [0068].

144. Thus, even in the narrow field of voting, "recursion" refers to a procedure calling itself. Voters forward the initiative on to other voters, etc., recursively (i.e., each voter follows the process invoked by previous voters).

145. It is my opinion that "recursively modifying," as used in the Recursive Claims, means "modifying by a computational procedure that calls itself."

146. As shown at ¶¶ 291-297, there is no disclosure whatsoever in the specification of any recursive procedure or algorithm, and thus the Recursive Claims lack written description and enablement.

147. In the event that the Board does not adopt the above construction, but interprets "recursively modifying" to mean "iteratively modifying," which it does not, Recursive Claims 30, 32, 33, 36, 37 and 38 would not be invalid for lack of written description and enablement, but would be invalid as obvious. See ¶¶ 298-305.

X. GROUND 1: THE CHALLENGED CLAIMS ARE DIRECTED TO AN ABSTRACT IDEA

A. Step2A—Prong 1 of the Guidance

148. Each of the Challenged Claims is directed to a "method for electronic voting using printed vote records" and requires some form of each of the following

steps: (a) "recording a voter's vote selections," (b) "generating a printed vote record of the voter's vote selections … containing voter readable text indicating the voter's vote selections," (c) "scanning the printed vote record, the scanning including scanning the voter readable text," (d) "utilizing optical character recognition (OCR) on the scanned voter readable text to create a data set which identifies the voter's vote selections," and (e) "generating a cast vote record from the data set." The claims are thus directed to the abstract ideas of printing a vote record, verifying the accuracy of the printed vote record, and then tabulating the vote from the verified printed vote record .

149. Using a computer to receive data, process data, generate data, and perform data calculations (*e.g.* perform a hash function) are very basic functions of any computer.

150. The functions recited in the claims, such as printing, scanning, "utilizing" OCR, encoding and decoding barcodes, producing hash values and verifying authenticity are all generic, well-known, routine and conventional electronic voting operations that could readily be performed using well-known, routine, and conventional computer technology.

151. In my opinion, these claim elements, individually and considered as a whole, are directed to the use of generic computer technology, such as printers, scanners, and "computer devices" to perform routine electronic voting steps that

have been performed by individuals for hundreds of years—namely, voting and confirming the accuracy and authenticity of a printed record of that vote.

152. The '319 Patent itself confirms this, describing the claimed methods as simply "provid[ing] an electronic voting system that utilizes PVRs in a manner that provides better transparency to the voter"—*i.e.* providing a "what you see is what you get" PVR to the voter. Ex. 1001 at 1:66-2:10.

153. The Challenged Claims merely incorporate known computer technology and processes to perform this abstract idea of printing a vote record, verifying the accuracy of the printed vote record, and then tabulating the vote from the verified printed vote record.

154. For example, the '319 Patent recites that, after the voter confirms the accuracy of the PVR, "conventional scanning hardware" is used to create an image of the PVR. Ex. 1001 at 4:20-27. The Independent Claims of the '319 Patent similarly require "electronically capturing" "[first] information" and "second information" from the printed vote record." Independent Claim 29 specifies that a "scanner" is used to capture this information. Conventional OCR techniques are then used to create a data set indicating the voter's voting selections from those voter readable characters on the PVR. *Id*. at 4:12-16.

155. Use of OCR is a well understood, routine, and conventional activity previously known and used in the voting industry. *See*, *e.g.*, Ex. 1004 at [0134];

Ex. 1020 at 8:45-9:16; Ex. 1021 at 98; Ex. 1022 at [0036]; Ex. 1023 at [0049]-[0050]; Ex. 1024 at [0098]; Ex. 1025 at [0287]-[0288]; Ex. 1026 at 7:20-23. The '319 Patent does not disclose or claim any new OCR techniques or advances over then existing OCR techniques.

156. The '319 Patent itself confirms that the purpose of using OCR and OCR correction techniques on the OCR data set is simply to ensure that the "voting system directly interprets the voter selections from the PVR just as the voter sees the data. In this manner 'what you see is what you get' printed vote record data is provided for a voter's viewing and that same data is used to generate the cast vote record." Ex. 1001 at Abstract.

157. Independent Claim 29 is directed to "an electronic voting system for using printed vote records." Claim 29 further requires: (1) a generic "printer" configured to generate a PVR including voter readable text; (2) a generic "scanner" configured to electronically capture information from the PVR, including "encoded data"; and a (3) generic "processor" configured to (i) use OCR on the electronically captured information; (ii) decode the "encoded data"; (iii) generate and compare "data set[s]" and (iv) confirm the accuracy of the data captured from the PVR; and (iv) generate a CVR.

158. Independent claims 1, 15 and 34 are method forms of claim 29 and are thus directed to the same abstract idea.

159. The independent claims of the ‘319 Patent merely invoke the use of generic computer components and processes to facilitate a voter’s use of an electronic voting machine and to ensure the accuracy and integrity of the printed record of his/her vote. The generic computer components and processes disclosed and claimed in the ‘319 Patent do not represent any improvement in the functioning of a computer.

160. In my opinion, none of these dependent claims of the ‘319 Patent recite any additional elements or combination of elements that amount to significantly more than basic steps, long practiced in the computer and electronic voting industries, in the fundamental practice of voting and verifying the accuracy and authenticity of a printed record of the vote.

161. In particular, the Recursive Claims, to the extent they can be understood, do not improve the functionality of the underlying generic computer components recited in the claims as performing such processes.

162. Further, all of the steps and elements recited in the Challenged Claims were well-known, routine and conventional and do not produce any unexpected results.

B. Step2A-Prong 2: The Challenged Claims Do Not Integrate the Abstract Idea of Voting and Ensuring the Accuracy and Authenticity of the Printed Vote Record Into a Practical Application

163. It is my understanding that this step of the *Guidance* inquiry is evaluated by "(a) identifying whether there are any additional elements recited in the claim beyond the judicial exception(s); and (b) evaluating those additional elements individually and in combination to determine whether they integrate the exception into a practical application."

164. The *Guidance* directs that examples of such a "practical application" include an additional element that reflects "[a]n improvement in the functioning of a computer, or an improvement to other technology or technical field…." MPEP § 2106.04(d)(I).

165. In my opinion, no element of any of the Challenged Claims provides or reflects any such improvement.

166. To the contrary, the Challenged Claims merely use generic and conventional computer components and processes such as printing, scanning, "using" OCR and known OCR error-correction techniques, creating and comparing data sets, and hashing.

167. In my opinion, the Challenged Claims seek only to limit the abstract idea of voting and confirming the accuracy and authenticity of a printed document to the existing technological environment of electronic voting machines.

168. The specification of the '319 Patent confirms this. For example, Figure 1 of the '319 Patent shows an "embodiment of a voting system for utilizing

the techniques described" in the '319 Patent. Ex. 1001 at 3:66-4:2. Figure 1 is reproduced below:

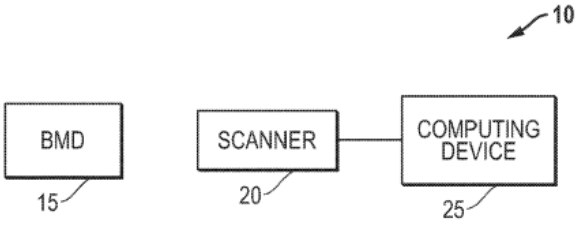


FIG. 1

169. This "exemplary embodiment" is the only embodiment shown in the figures or described in the '319 Patent and consists of nothing more than a well-known prior art BMD voting machine (which includes an "internal printer" that is not shown and "may be utilized to print a voter's selections on a PVR"), a generic scanner, and a generic "computing device" (collectively referred to as a "voting system 10" in the '319 Patent). *See id*. at Fig. 1; 3:66-4:38.

170. The very architecture of Fig. 1, that is a separate BMD and a computer/scanner, was purely conventional.

171. The '319 Patent further states that the "BMD" includes an "internal printer" and "a variety of hardware and software, including a memory, processors, associated election software, input devices, etc., **all as is known in the art**." *Id*. at 4:42-47 (emphasis added).

172. Similarly, the '319 Patent describes the scanner used in the claimed voting methods as using "conventional scanning hardware." *Id*. at 4:25-27 ("The

scanning hardware for the scanner 20 may be **conventional scanning hardware**") (emphasis added).

173. The '319 Patent provides almost no description of the generic "computing device 25" of Figure 1. The only discussion of the "computing device 25" in the '319 Patent merely states that the computing device can receive an image from the scanner, perform "data analysis" such as OCR processes and associated error correction and/or computation of a hash value, and generate an electronic cast vote record. *Id*. at 3:66-4:38; 6:9-55.

174. The dependent claims also fail to provide any new practical application of the abstract concept. Rather, the dependent claims merely recite additional well-understood, routine, and conventional activities.

175. The dependent claims also include generic and known use of "encoded data" and barcodes (Claims 2, 3, 5, 6, 8, 13, 16, 19, 26) to confirm the accuracy of the OCR data set, and/or use of a generic "hash" (Claims 17, 18, 24, 25, 31, 32, 33, 35, 37) to confirm the accuracy of the OCR and/or authenticity of the printed vote record. The claims do not specify the hash function to be used, and the specification only generically refers to a "secure hash function," a "one way hash," and a "digitally signed hash," all of which were conventional. Ex. 1001 at, e.g., 2:43-58; Using a computer to receive data, process data, generate

data, and perform data calculations (e.g. perform a hash function) are basic functions of any computer.

176. Claims 9, 12, 13, 14 generically require that the "second data set" in Claim 1 is based at least in part on undefined "other information" and thus add nothing "more" under *Alice* Step 2.

177. Claims 4, 7, 10 are directed to well-known, conventional, and routine scanning functions, such as scanning and capturing "voter readable text" and capturing an "image" of the PVR. Capturing images is what scanners do.

178. Claims 11, 23, and 40 merely require that the CVR be the only casted vote used for tabulation. Claim 22 similarly requires only that the CVR is utilized during tabulation. Using only CVRs for tabulation was also well-known, conventional and routine.

179. Claims 20 and 27 require only that the CVR be based on the first data set of Claim 15, wherein the first data set is based on the voter readable text of the PVR. But that is simply a conventional manner in which CVRs are obtained from PVRs.

180. Claims 21, 22, 28, 30, 32, 33, 36, and 38 (the Recursive Claims) require recursively modifying an OCR process applied to the voter readable text (claims 21, 22, 28) or recursively modifying the first data set (claims 30, 32, 33, 36, 38). As explained at ¶¶ 291-297, the Recursive Claims, properly construed,

lack written description and enablement. In the event that the Board construes "recursively modifying" to mean "iteratively modifying," which it does not, claims 30, 32, 33, 36, and 38 (referring to modifying the first data set) would not lack written description or enablement, but would be patent-ineligible because iterative modification of voting data sets (e.g., during correction processes) was conventional.

181. The Recursive Claims, properly construed, lack written description and enablement. In the event that the Board construes "recursively modifying" to mean "iteratively modifying," which it does not, claims 21, 22, and 28 would remain invalid for lack of written description and enablement, as no iterative "modification" of any OCR process is described, or even hinted at, in the specification.

182. Claim 39 requires using the PVR to audit the election. An election audit, frequently called a "recount," is a well-understood, routine, and conventional process long used in the voting machine industry, as recognized by the '319 Patent. Ex. 1001 at 1:41-50.

183. In my opinion, the purported inventions of the '319 Patent fail to provide any additional element that reflects an improvement in the functioning of a computer, or an improvement to any other technology or technical field.

C. *Alice* Step 2; Guidance Step 2B – The Challenged Claims Do Not Provide an Inventive Concept or Significantly More Than the Abstract Idea

184. Again, it is my opinion that the Challenged Claims are directed to the abstract idea of printing a vote record, verifying the accuracy of the printed vote record, and then tabulating the vote from the verified printed vote record .

185. The *Guidance* makes clear that the mere use of "a computer as a tool to perform an abstract idea" is insufficient to render an abstract claim patent-eligible. MPEP § 2106.04(d)(I) .

186. As shown in ¶¶ 165-173 above, the elements of the Challenged Claims use known and routine computer components to permit a voter to vote using an electronic voting machine and verify the accuracy of the printed record of that vote. Specifically, the Challenged Claims require only generic limitations implemented on a computer such as "generating a printed vote record," "electronically capturing information from the printed vote record," "using optical character recognition" on the scanned image of the printed vote record, "generat[ing] a first data set" from the OCR process, "comparing" data sets, and "generating a cast vote record."

187. In my opinion, none of these elements constitutes an "inventive concept," as they were well-known, routine and conventional activities in the computer sciences and electronic voting machine industry.

188. The Challenged Claims also include use of a generic hash function to confirm the accuracy and authenticity of the printed vote record. This hash is used only for its intended purpose of verification and not in any novel manner.

189. Using a computer to receive data, process data, generate data, compare data, and perform data calculations (e.g. generate a hash function) are very basic functions of any computer.

190. Each of the steps of the Challenged Claims are thus generic, routine, and conventional activities performed only for their conventional purposes. None of these steps or activities are used in an unconventional manner or produce an unexpected result.

191. In my opinion, when viewed as a whole, each Challenged Claim is drawn to the concept of printing a vote record, verifying the accuracy of the printed vote record, and then tabulating the vote from the verified printed vote record .

192. In my opinion, the combination of steps in each Challenged Claim simply adds nothing that is not already present when the steps are considered individually.

193. The dependent claims also fail to provide any new practical application of the abstract concept. Rather, the dependent claims of the '319 Patent merely recite additional well-understood, routine, and conventional activities.

194. In my opinion, none of the dependent claims provides an inventive concept because each recited data element is fundamental to the conventional practice of voting.

195. The use of printers, scanners, and "computing devices" was well understood, routine, and conventional by a POSITA at the time the '319 Patent was filed. This is supported by the fact that neither the claims nor the specification describe how the disclosed "computing device" shown in Figure 1 of the '319 Patent accomplishes the claimed functions. The recited processes are merely the standard functions of generic computer components.

196. In summary, and based on the analysis provided above, it is my opinion that the Challenged Claims are directed to the abstract idea of printing a vote record, verifying the accuracy of the printed vote record, and then tabulating the vote from the verified printed vote record.

XI. OVERVIEW OF THE PRIOR ART REFERENCES

A. Brockhouse

197. Brockhouse, entitled "Universal Voting Station and Tabulation Device," was filed February 11, 2014 and published on August 21, 2014. Ex. 1004.

198. In an embodiment, the electronic voting station "receives an activation card, presents at least one election contest to a voter, receives at least one voting

selection corresponding to the election contest from the voter, and prints the voting selection on the activation card." *Id*. at [0008].

199. The voting system and methods disclosed in Brockhouse include a touchscreen display, such as a 15 inch LCD display screen, that a voter may use "to enter his/her voting selections." *Id*. at [0041]. Brockhouse alternatively teaches that a voter may enter his/her voting selections using a keypad. *Id*. at [0042].

200. After the user of the Brockhouse system enters his/her voting selections, those voting selections are printed on the activation card. *Id*. at [0049] ("Printer 72 is preferably a thermal printer manufactured by Seiko that is operable to print voting selections entered by the voter on an activation card 20 moving through paper path module."); *see also id.* at [0039]. This process creates a PVR of the voter's voting selections using human readable characters as further explained in Paragraph 106:

> If the voter is satisfied with his/her voting selections, the voter selects the "Mark Card" button on the screen shown in FIG. 15G. After the voter selects this button at step 310 (FIG. 14A), paper path module 46 moves activation card 20 into the position shown in FIG. 9E to prepare it for printing. The paper path module 46 then moves the activation card 20 along the path shown in FIG. 9F past the printer 72 and scanner 74. Printer 72 prints on activation card 20 the master barcode 110, vote selection barcodes 112, and vote selections 114 corresponding to the vote selections made by the voter, as shown in FIG. 6.

Id. *See also id.* at Fig. 14A at Reference 312 ("Print Bar Codes and Human Readable Text").

201. Brockhouse also discloses that a barcode representing the voter's voting selections may also be printed on the activation card. *Id*. at [0053] ("Referring to FIG. 6, after a voter has made his/her voting selections with universal voting station 12, printer 72 prints a master barcode 110, **vote selection barcodes 112**, and vote selections 114 on activation card 20.") (emphasis added).

202. The human readable text and the barcode are visible in the sample printed activation card shown in Figure 6 of Brockhouse:

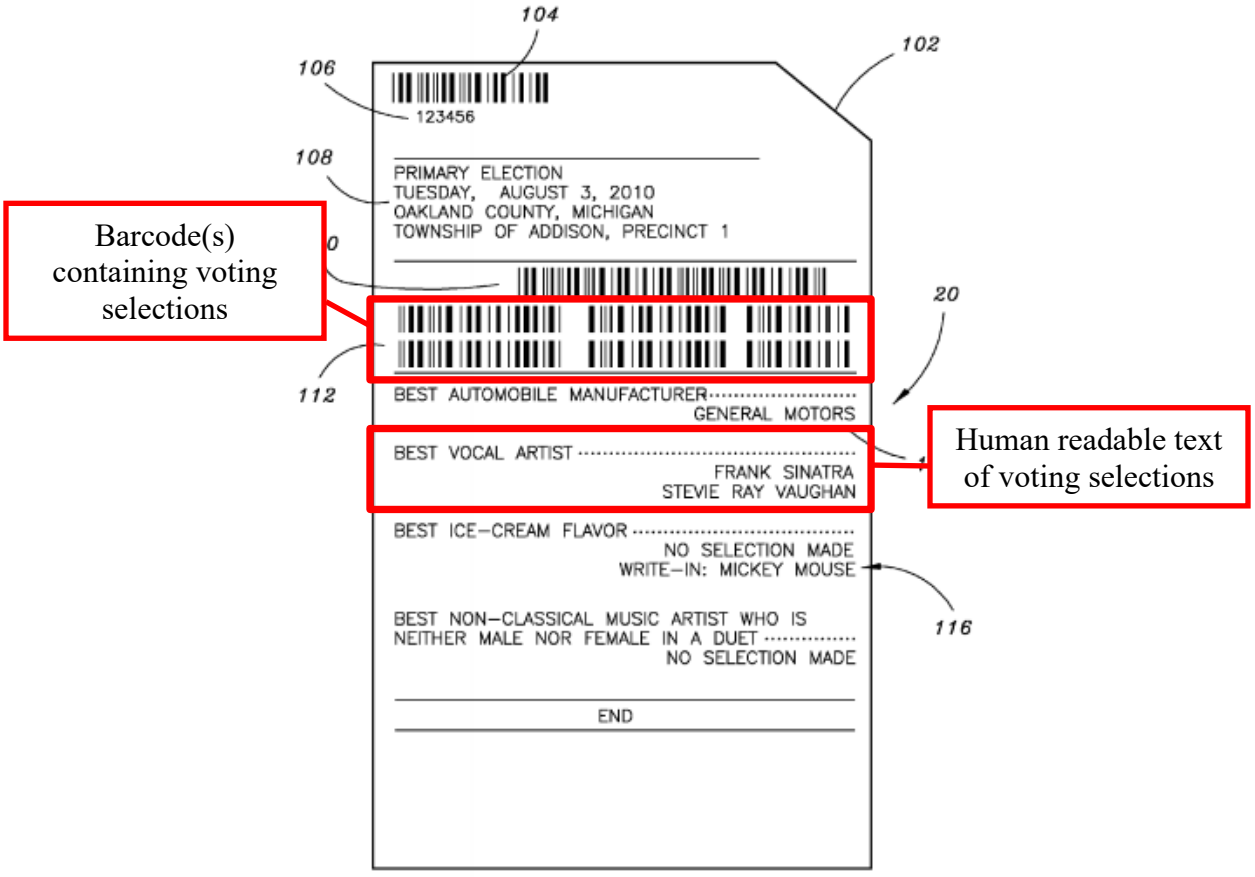


FIG. 6

203. The human readable text printed on the PVR also includes additional information such as the contest name (*e.g.* BEST VOCAL ARTIST). *Id*.

204. The system disclosed in Brockhouse further includes a scanner. *Id*. at [0050]. The scanner comprises one or more contact image sensor(s) and is positioned "so that it is operable to image material printed on [the] activation card." *Id*. *See also id*. at [0134]. The scanner is configured to scan the full printed activation card, including both the barcodes and human readable text. *Id*. at [0106], [0130], [0134].

205. The system of Brockhouse can then use optical character recognition on the image of the PVR to create a data set identifying the voter's voting selections. *Id*. at [0134] ("In each of the embodiments described above, universal voting station 12 and/or tabulation device 14 may use optical character recognition (OCR) to decode the voter selections 114 on the printed activation cards").

206. The resulting data set representing the voter's voting selections can be used to create a cast vote record. This process is described in Paragraph 134 and shown in Figure 14B:

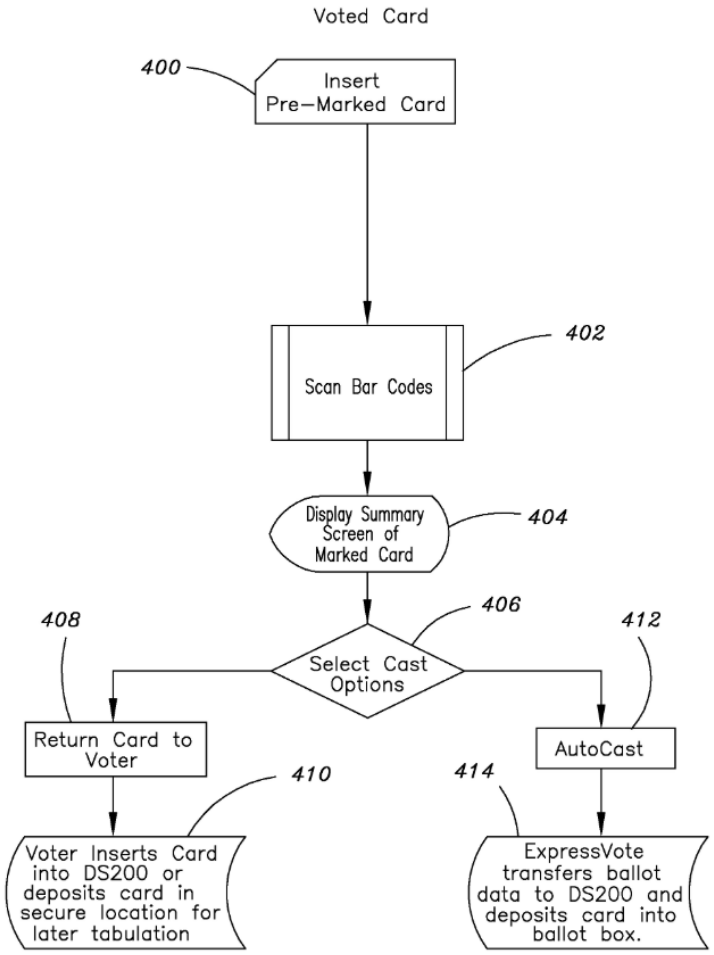


FIG. 14B

207. As Paragraph 134 of Brockhouse makes clear, the system can use the OCR data set or the decoded barcode information to create the cast vote record. *Id.* at [0134]. The steps for casting the vote using this information (whether from the OCR dataset or the decoded barcode) are shown in Steps 406, 410, 412, and 414 in Figure 14B shown above.

B. Nadaf

208. Nadaf (BR 10 2013 018558-2 A2), entitled "Verification Ballot Printing and Collection Equipment and Equipment for Auditing and Counting

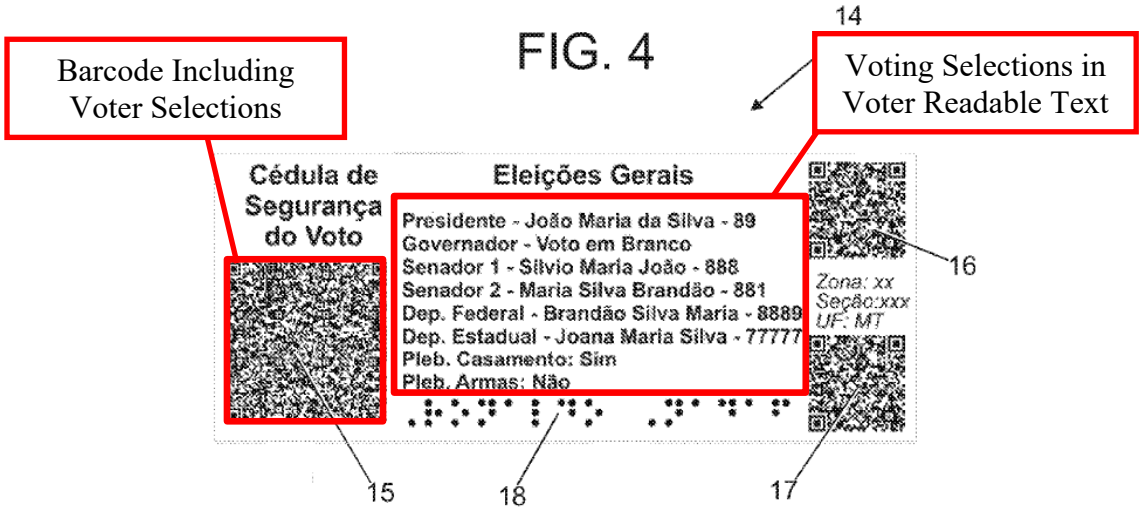
Votes Printed on Verification Ballots for a Mechatronic Voting Model," was filed on July 19, 2013 and published on September 2, 2014. Ex. 1007 at 1.

209. Nadaf is generally directed to an electronic voting system that includes equipment for allowing the voter to vote, obtain a PVR, and confirm that the PVR accurately represents the voter's voting selections. *Id*. The system of Nadaf also includes a second piece of equipment for counting the votes using the PVR. *Id*.

210. The electronic voting system and methods disclosed in Nadaf was developed to address certain stated shortcomings of DRE voting machines, including the fact that such machines did not "comply with current legislation" [in Brazil], as well as the basic requirements of the North American standards, since it was a collector and counter of votes … without printing the vote for verification by the voter." *Id*. at 9:18-10:3.

211. A voter using the system and methods disclosed in Nadaf enters his/her voting selections using "a reversible keyboard and touch-sensitive screen" or a "tablet." *Id*. at 12:2-9.

212. After the voter makes his/her voting selections, those voting selections are printed on a PVR as seen in Figure 4 of Nadaf:



Ex. 1007 at Fig. 4.

213. As seen in the image above, the voting selections are printed in voter readable text as well as in the form of a 2-D barcode (a QR code). *Id*. *See also id*. at 14:10-14 ("The verification ballot (14) for the vote, shown in Figure 4, will show the choices of the voter for each office being contested in that election … stated in sufficiently legible text. The ballot (14) will also show the complete vote by the voter encoded in a two-dimensional barcode").

214. The ballot shown in Figure 4 also contains two additional barcodes, each providing a "digital signature, in this case related to the text of the vote printed on the ballot." *Id*. at 14:15-19.

215. Nadaf further discloses that the voter can visually compare the text on the PVR with the decoded barcode containing the voter's voting selections to confirm the accuracy of the PVR. *Id*. at 15:1-4.

216. After confirming the PVR, the voter inserts the PVR into the "input for confirmation of votes (9)." *Id*. at 15:4-5. The digital signatures are extracted and confirmed to ensure the PVR is authentic, the PVR is then stored in a "collection urn" or ballot box and the digital record of the vote is cast by Equipment (1). *Id*. at 15:8-12.

217. The "collection urn" containing the PVRs is subsequently taken to the "vote auditing, counting, and tabulating area." *Id.* at 17. The "collection urn" is then "connected" to Equipment (19), the "Equipment for Auditing and Counting Votes Printed on Verification Ballots." *Id*. at 17:16-18:3. The PVRs are then fed through the "optical reader (25)." *Id*. at 19:7-9.

218. The "optical reader (25)" "has an optical OCR and QR code reader" and a "CPU (25)" which will "read the bar codes (16), (17) or (18), extract[] and verify[] the digital signatures, and compar[e] the text vote information to the vote information encoded into the bar code." *Id*. at 18:9-19:9.

219. If the OCR data set and the information resulting from decoding of the barcode match, "the printed vote is then recorded electronically and sent to a module (26) where, along with the other ballots (14) from the polling station being tabulated, they will be stored." *Id*. at 19:10-3.

220. While Nadaf discloses a direct-recording electronic (DRE) voting system, it also discloses a paper-based voting system. A POSITA also would have

known at the time of the invention that there were jurisdictions in the United States that do not permit use of DREs. Nadaf's disclosure of a PVR, and subsequent processing of the PVR to scan the voting selections, use OCR on the voter readable text, decode the voting selections from the barcode, confirm the accuracy of the data, and generate a CVR from the data is similar to the processes used in BMD voting systems.

C. Schneier

221. Schneier, entitled "Applied Cryptography" (Second Ed.) is a widely-regarded textbook published in 1996 by John Wiley & Sons, Inc. Ex. 1009. It is a thorough exposition of cryptography known at the time, and specifically deals with the use of cryptography in voting systems. In particular, Section 6.1 of Schneier is entitled "Secure Elections" and explains the use of digital signatures (which require hash functions) in voting. Ex. 1009 at 125-126.

222. Schneier further explains that "[t]o save time, digital signature protocols are often implemented with one-way hash functions. … Speed increases drastically and, since the chances of two different documents having the same 160-bit hash are only one in 2^{160}, anyone can safely equate a signature of the hash with a signature of the document." *Id*. at 38. *See also id*. at 30 ("A single bit change in the pre-image changes, on the average, half of the bits in the hash value. Given a

hash value, it is computationally unfeasible to find a pre-image that hashes to that value.").

223. Section 2.4 of Schneier explains the use of one-way hash functions to "fingerprint" files and that the hash-value can be used at any time to confirm the accuracy and authenticity of a document, such as a check. Ex. 1009 at 30-31. Section 2.5 of Schneier describes the creation and use of digital signatures. *Id*. at 31.

D. Heilper

224. Heilper (U.S. Pat. No. 7,406,201), entitled "Correcting Segmentation Errors in OCR," was filed on December 4, 2003 and issued on July 29, 2008. Ex. 1005. Heilper was assigned to International Business Machines Corporation ("IBM"). *Id*.

225. Heilper is generally directed to "[a] method for encoding characters includes identifying one or more sequences of the character codes that are likely to be generated due a segmentation error in application of a pattern recognition process, and associating a respective extension character code with each of the sequences." *Id*. at Abstract.

226. In the Background of the Invention section, Heilper explains the basic process behind OCR technology:

> OCR is a computerized method for converting printed or handwritten text from a scanned document into corresponding strings of character

> codes, such as ASCII codes. The OCR process typically includes several stages: First the text on the scanned document is segmented into individual characters. A pattern recognition algorithm is then applied to each character in order to find the likeliest match among the possible character codes.

Id. at 1:13-20.

227. Heilper further explains that OCR processes were known to be error prone and that dictionaries were commonly used to correct such errors:

> Because these steps are error-prone, they are typically followed by an error-correction step. For example, the computer may look up each OCR-generated word in a dictionary. The computer may automatically correct words that are not found in the dictionary by substituting the nearest match from the dictionary.

Id. at 1:20-25.

228. Heilper further explains how string matching algorithms, such as the Levenshtein distance, have been used in the OCR error correction process:

> Dictionary-based OCR error correction typically uses an approximate string-matching algorithm to find the nearest match. Many of these algorithms are based on the notion of edit distance, as described, for example, by Damerau in "A Technique for Computer Detection and Correction of Spelling Errors," Communications of the Association for Computing Machinery 7 (March, 1964), pages 171-17 6, which is incorporated herein by reference. The distance between two strings is determined by the number of edit operations that are needed to transform one string into another. This distance is commonly referred to as the "Levenshtein distance," based on the work described by Levenshtein in "Binary Codes Capable of Correcting Deletions, Insertions and Reversals," Soviet Physics Doklady 8 (1966), pages 707-710, which is incorporated herein by reference.

Id. at 1:26-41.

XII. GROUND 2: CLAIMS 1-20, 23-27, 29, 31, 34, 35, 39, AND 40 ARE INVALID AS OBVIOUS OVER BROCKHOUSE IN VIEW OF NADAF AND SCHNEIER

A. Motivation to Combine Brockhouse, Nadaf, and Schneier

229. A POSITA would have been motivated to combine Brockhouse, Nadaf, and Schneier with a reasonable expectation of success. Brockhouse and Nadaf each disclose electronic voting machines that utilize PVRs and generate CVRs. Further, Brockhouse and Nadaf both disclose using OCR processes on voter-readable text printed on the PVR, as well as barcodes (encoded data) printed on the PVR. Schneier provides general teachings on the use of cryptography in electronic voting and discloses specific protocols for using hash functions and digital signatures in "computerized voting" systems to ensure "individual privacy" and "prevent cheating." Ex. 1009 at 125. It follows that these references are at least analogous art to the '319 Patent, in the same field of endeavor, and reasonably pertinent to the problems the inventors faced.

230. Brockhouse further teaches that the OCR data set generated after scanning the PVR can be used to generate the CVR that is used to tabulate the election. Ex. 1004 at [0134]. A POSITA would know that OCR processes are error- prone, so would look to other references such as Nadaf and Schneier to find ways to verify the accuracy of the OCR processes and the integrity of the PVR itself. See also, e.g., Ex. 1025 (Sebes) at [0312] ("OCR does sometimes create

errors, for example "Johm Quincy Adams."); Ex. 1005 at 1:13–41. And, as the Board explained in its Final Written Decision in the '966 PGR, "hashes provide a solution to the altered-ballot problem …[and] adding hashes would provide an additional measure of security." Ex. 1015 at 65.

231. Nadaf teaches that the accuracy of an OCR data set can be confirmed before generating a CVR by comparing the OCR data set to the content of the bar code also printed on the PVR. Ex. 1015 ('966 FWD) at 45 ("It is undisputed that Nadaf's equipment 19 compares the 'text vote information' to 'the vote information encoded into the bar code.'") This step in the Nadaf process is referred to as a "comparative audit" that is conducted in the "vote auditing, counting and tabulating area" using Equipment 19. Ex. 1007 at 17:13-18:3. Nadaf further teaches the use of hash functions and digital signatures, including via the Elliptical Curve Digital Signature Algorithm ("ECDSA"), to confirm the accuracy of the OCR data set and the authenticity of the PVR. *Id.* at 14:15-18 (explaining the PVR has barcodes printed on it that will "provide a digital signature, in this case related to the text of the vote printed on the [PVR]."). *See also* Ex. 1015 ('966 FWD) at 44-45. A POSITA reading Nadaf would have consulted a textbook such as Schneier to learn how to use the ECDSA to create digital signatures. Schneier provides the answer. *See also* Ex. 1054, 38; Ex. 1009 (Schneier) at 480-481 (explaining in 1996 that "Elliptical curves have been studied for many years").

232. Brockhouse also discloses that its systems include a "security sensor that detects counterfeit ballots and ballots or activation cards that have been tampered with." Ex. 1004 at [0085]. Brockhouse, however, does not disclose the details of such a "security sensor." A POSITA would therefore be motivated to look to other references, such as Nadaf and Schneier, for additional disclosures of processes and systems for protecting against counterfeit or tampered ballots.

233. Schneier teaches that "[c]omputerized voting will never be used for general elections unless there is a protocol that maintains individual privacy and prevents cheating." Ex. 1009 at 125-126. Among the considerations Schneier identifies for the adoption of such "computerized voting" are:

> ….
>
> 5. No one can change anyone else's vote without being discovered.
>
> 6. Every voter can make sure that his vote has been taken into account in the final tabulation.

Id. Schneier discloses several possible ways to accomplish these objectives, including the use of digital signatures. *Id*. Schneier further teaches that, "[t]o save time, digital signature protocols are often implemented with one-way hash functions. … Speed increases drastically and, since the chances of two different documents having the same 160-bit hash are only one in 2^{160}, anyone can safely equate a signature of the hash with a signature of the document." *Id*. at 38; *see also id*. at 30 ("A single bit change in the pre-image changes, on the average, half

of the bits in the hash value. Given a hash value, it is computationally unfeasible to find a pre-image that hashes to that value."). Thus, by incorporating a hash value or digital signature as taught by Schneier and Nadaf, the Brockhouse system can quickly and efficiently verify the accuracy and integrity of the PVR used to generate the CVR for tabulation. The combination involves well-known prior art elements and would have predictable results in document and data authentication.

B. Independent Claims 1, 15, 29, and 34 Are Unpatentable as Obvious

1. "A method for electronic voting using printed vote records"

234. The preamble of claims 1, 15, and 34 recite "a method for electronic voting using printed vote records." The preamble of claim 29 recites, "An electronic voting system for using printed vote records.

235. Brockhouse discloses a system and method for electronic voting using printed vote records. Ex. 1004 at, e.g., Abstract ("A voting system including a universal voting station and a tabulation device. The voting station is operable to receive an activation card on which it prints a voter's voting selection.");*see also id.* at Fig. 1; Fig. 6.

236. Nadaf also discloses systems and methods for electronic voting using printed vote records:

> The vote in text form produced for the ballot will be generated by an electronic vote recording device (Direct Recording Electronic – DRE) that can even be the actual urn in use today, which will be connected,

> via a USB port, to the VERIFICATION BALLOT PRINTING AND COLLECTION EQUIPMENT.
>
> The system will make it possible for the user to vote electronically which, after it is completed, **will generate the printed vote, providing the voter with assurance of their choice and preventing equipment failure from being able to change the vote cast digitally**.

Ex. 1007 at 10:13-11:1 (capitals in original, bolding added for emphasis).

2. Limitations 1(a)(b), 15(a)-(b), 29(a)-(b), 34(a)-(b)

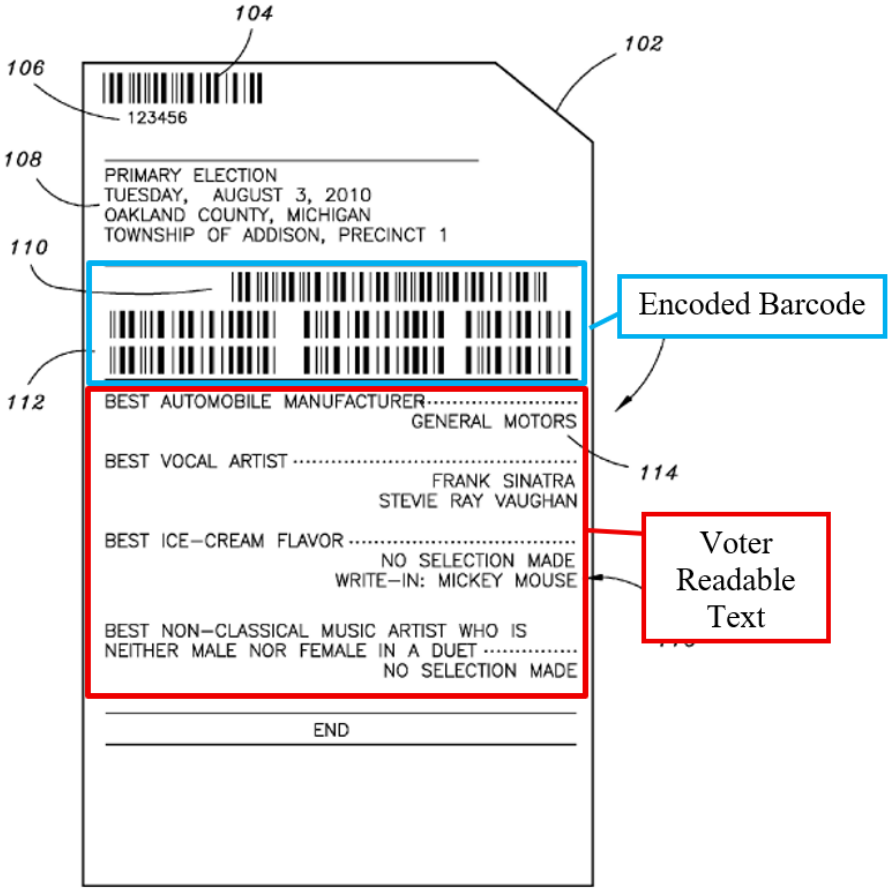
generating a printed vote record of at least one vote selection of a voter
providing, on the printed vote record, voter readable text indicating the voter's at least one vote selection (claims 1, 15, 34)

a printer configured to generate a printed vote record of at least one vote selection of a voter,
the printed vote record including voter readable text indicating the voter's at least one vote selection; (claim 29)

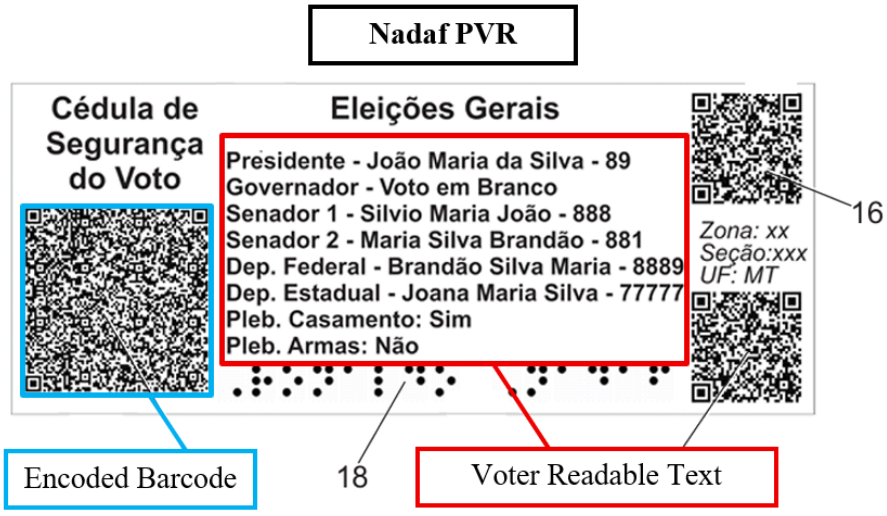
237. Printed vote records containing voter readable text indicating the voter's vote selections were known in the electronic voting machine industry long before the filing of the '319 patent. *See, e.g.*, Ex. 1019 at 169-70 ("The paper ballot is …the paper on which the voter's voices are recorded. It must be 'cast' in order to be tallied … The paper ballot can easily be read by the voter so that the voter may verify that his or her choices have been properly marked. It also contains security markings and a barcode. The barcode encodes the user's choices, as expressed in the human readable portion of the ballot."); Ex. 1025 (Sebes) at [0086], [0286]-[0288]; Ex. 1047 (Provitola) at 6:20-32 ("print out the election

ballot according to which the voter voted with the votes of the voter printed thereon, so that the votes of the voter are readable on said election ballot by the voter and readable by a tabulating machine").

238. The Board found in the '966 PGR that Brockhouse and Nadaf each discloses printing a PVR containing voter readable text indicating the voter's vote selections, as shown in the following Figures:



Brockhouse PVR



Ex. 1015 ('966 PGR FWD) at 14-15, 37-38; Ex. 1004, Fig. 6 (annotated); Ex. 1007, Fig. 4 (annotated). *See also* Ex. 1004 at [0016], [0053], [0106]; Ex. 1007 at 14:7-14.

3. Limitations 1(c), 15(c), 29(c), 34(c)

electronically capturing information from the printed vote record (claim 1)

electronically capturing first information from the printed vote record (claims 15, 34)

a scanner configured to (1) electronically capture first information from the printed vote record, the first information including the voter readable text, (claim 29)

239. Claim 1 requires that "information" from the PVR be electronically captured. Claims 15 and 34 refer to this as "first information." Claim 29 requires a "scanner" that is "configured to (1) electronically capture first information." The "electronically capturing" information from the PVR can be performed by "scanning" the PVR.

240. Both printing a PVR bearing voter-readable text corresponding to the voter's vote selections, and then scanning the PVR to capture the voter readable text—i.e. first information—were long known in the art. *See, e.g.*, Ex. 1019 at 8 ("the Ballot Reconciliation System reads the OCR text of the ballot as well, not just the barcode"); Ex. 1025 at [0321]-[0325] ("The ballot tabulation apparatus 2400 may tabulate a paper ballot 2436 scanned via the scan bed …. OCR 2410 (as configured by positive identification configuration settings 2428) and/or hand writing analyzer 2412 may be applied to identify selections associated with mark zones when the ballot layout definition 2418 does not correlate the mark zones to selections. Once the ballot marks are identified they may be tabulated by the tabulator 2430, as previously described").

241. The Board held in the '966 PGR that Brockhouse discloses scanning the PVR including the voter readable text. Ex. 1015 at 15. *See also* Ex. 1004 at [0106] ("Scanner 74 produces an image of the activation card 20 and the master barcode 110, vote selection barcodes 112, and vote selections 114 printed thereon.); [0130] ("tabulation device 14 receives an activation card 20 in ballot insertion tray 188 instead of receiving a paper ballot. Ballot scanner assembly 194 scans activation card 20 to capture its image as it does with a paper ballot, and transmits the captured image to the processor of CPU board 196."); [0134] ("In each of the embodiments described above, universal voting station 12 and/or

tabulation device 14 may use optical character recognition (OCR) to decode the voter selections 114 on the printed activation cards").

242. Nadaf, as the Board also held, contains an analogous disclosure. Ex. 1015 at 41. Nadaf teaches the ballot can be inserted into an "optical reader" (a scanner) that scans the printed ballot and "compar[es] the text vote information to the vote information encoded into the bar code." Ex. 1007 at 19:7-9. The scanner in the Nadaf system scans the voter readable text on the PVR.

4. Limitations 1(d), 15(d), 29(e), 34(d)

using optical character recognition (OCR) on at least a portion of the electronically captured information to generate a first data set, the first data set based at least in part on the voter readable text indicating the voter's at least one vote selection (claim 1)

using optical character recognition (OCR) on the first information to generate a first data set, the first data set based at least in part on the voter readable text indicating the voter's at least one vote selection (claims 15, 34)

a processor configured to (1) use optical character recognition (OCR) on the first information to generate a first data set based at least in part on the voter readable text indicating the voter's at least one vote selection (claim 29)

243. As discussed above beginning at ¶ 68, OCR processes have been known in the art for decades. *See, e.g.*, Ex. 1013 (US 5,764,799). Using OCR to read the voter-readable text on a PVR was also known in the art long before the earliest possible priority date of the '319 Patent. Keller, for example, taught in 2005 that the PVR was scanned and OCR processes were used to recognize and

record the voter's voting selections. Ex. 1019 at 169-70. Sebes also disclosed voting systems and processes that included BMDs and using OCR processes on a PVR generated by the BMD to record the voter's voting selections. Ex. 1025 at [0086], [0284], [0287]-[0289], [0310], [0312], [0325].

244. The Board found in the '966 PGR that Brockhouse discloses that OCR is used on the voter readable text on the PVR to create a data set which identifies the voter's vote selections and is subsequently used to generate the CVR. Ex. 1015, 11; Ex. 1004 at, e.g., [0134] ("In each of the embodiments described above, universal voting station 12 and/or tabulation device 14 may use optical character recognition (OCR) to decode the voter selections 114 on the printed activation cards as an alternative to decoding the vote selection barcodes 112 to determine the corresponding voting selections.").

245. The "optical reader" of Nadaf is "an optical OCR and QR code reader." Ex. 1007 at 18:9. The Nadaf system processes the result of the PVR scan and determines if the "text vote information" and the decoded barcode information match. *Id*. at 19:7-9. If so, the printed vote is counted electronically. *Id.* at 19:10-13 ("After a comparative audit, the printed vote is then recorded electronically and sent to a module (26) where, along with the other ballots (14) from the polling station being tabulated, they will be stored."); *see also id*. at 19:7-9 ("The ballots (14) are then fed through the optical reader (25), which will read the bar codes

(16), (17) or (18), extracting and verifying the digital signatures, and **comparing the text vote information to the vote information encoded into the bar code**.") (emphasis added). The Board found in the '996 PGR that Nadaf teaches using OCR on the scanned image to create a data set that identifies the voter's vote selections. Ex. 1015 ('966 PGR FWD) at 43-45.

5. Limitations 1(f), 15(e), 29(d), 34(e)

the second data set obtained from the printed vote record (claim 1)

electronically capturing second information from the printed vote record, to generate a second data set, the second information comprising encoded data (claims 15, 34)

[a processor configured to] (2) electronically capture second information from the printed vote record, the second information comprising encoded data **(claim 29)**

246. Claim 1 does not specify that the second data set must comprise "encoded data," but simply requires a "second data set obtained from the printed vote record." As explained in ¶¶ 78-86, above, a POSITA would have known that a bar code encodes data into a visual, machine-readable format that can be read by an optical scanner. A POSITA also would have known that printing barcodes encoding a voter's voting selection(s) on a PVR was known in the art at least as early as 2005. Ex. 1019 at 164.

247. Nadaf discloses including a barcode on the PVR in which the voter's vote selections are encoded. Ex. 1007 at 14:10-13 ("The verification ballot (14)

for the vote, shown in Figure 4, will show the choices of the voter for each office being contested in that election and/or ballot measure, stated in sufficiently legible text. The ballot (14) will also show the complete vote by the voter encoded in a two-dimensional bar code. . ..") As the Board found in the '966 PGR, Nadaf's barcode is decoded—thus creating a second data set—that is compared to the first (OCR) data set. Ex. 1015 at 44-45; Ex. 1007 at 19:7-9.

248. Brockhouse discloses that the voter's vote selections are presented on the PVR in two formats: (1) voter readable text that can be scanned and recognized using OCR processes; and (2) encoded in a barcode. Ex. 1004 at, *e.g.*, [0134]. While Brockhouse teaches that OCR may be used "to decode the vote selections on the [PVR] as an alternative to decoding the vote selection barcodes," as explained in ¶¶ 229-233, above, a POSITA would have been motivated to capture both sets of data (OCR and barcode) and compare them to ensure accuracy of the OCR process given that a POSITA would have known that OCR processes are error-prone. A POSITA also would have been motivated to capture both data sets electronically and compare them to ensure that the PVR had not been altered—*i.e.* to confirm the integrity of the PVR. *Id*. Comparison of non-electronic data sets would have been infeasible.

6. Limitations 1(e), 15(f), 29(h) (portion), 34(f) comparing the first data set to a second data set (claims 1, 15, 34)

an accuracy of data to be cast is confirmed based at least in part on a comparison of the first data set and the second data set (claim 29)

249. Brockhouse and Nadaf, as discussed above, perform OCR processes on voter-readable text on the PVR. A POSITA would know that OCR processes are error-prone. *See, e.g.*, Ex. 1005 (Heilper) at 1:15-125; Ex. 1025 (Sebes) at [0312]. The Board also recognized this fact in the '966 PGR FWD. Ex. 1015 at 60. Knowing that OCR processes are error-prone, and given the importance of ensuring that a cast vote record is accurate in an official election, a POSITA in 2018 would have been motivated to confirm the accuracy of the first (OCR) data set in Brockhouse before generating a CVR that would ultimately be stored as a "record of all of the voter's final vote selections" and used to tabulate the election A POSITA also would have been motivated to ensure that the PVR was authentic and had not been tampered with before generating the CVR.

250. To this end, the system of Brockhouse includes "a security sensor that detects counterfeit ballots and ballots or activation cards that have been tampered with." Ex. 1004 at [0085]. As explained above in ¶¶ 229-233, a POSITA would have looked to references such as Nadaf and Schneier for such processes.

251. Prior to creating the CVR that is used for counting and auditing, the voter of the Nadaf system is provided with the PVR to allow the voter can confirm the accuracy of the ballot by comparing the voter-readable text to the decoded data

from the barcode using second tablet (13). Ex. 1007 at 14:7-15:5. After confirming that the PVR accurately reflects the voter's vote selections, the voter inserts the PVR into the input for confirmation of votes. *Id*.

252. After the voter inserts the PVR for confirmation, the digital signatures on the PVR are checked to ensure the PVR is authentic and the PVR is then stored in a "collection urn" (ballot box) and the CVR (digital record of the vote) is cast. *Id*. at 15:6-15. Thus, the CVR used to tabulate the vote in Nadaf is not generated until the voter is allowed to confirm that the voting selections in the bar code match the voter's actual selections.

253. The "collection urn" containing the PVRs is subsequently taken to the Equipment for Auditing and Counting Votes Printed on Verification Ballots (equipment 19). *Id*. at 17:16-18:3. "The [PVRs] (14) are then fed through the optical reader (25), which will read the bar codes (16), (17) or (18), extracting and verifying the digital signatures, and **comparing the text vote information to the vote information encoded into the bar code**." *Id*. at 19:7-9 (emphasis added). As the Board held in the '966 PGR, the information in Nadaf's barcode is decoded—thus creating a second data set—and compared to the first (OCR) data set. Ex. 1015, 44-45. This "comparative audit" confirms the accuracy of the data sets.

7. Limitations 1(g), 15(g), 29(f), 29(h) (portion), 34(g)-(h)

generating a cast vote record, which is to be a stored record of all of the voter's final vote selections and to be the voter's casted vote used for vote tabulation, the cast vote record indicating the voter's at least one vote selection, wherein, prior to generating any cast vote record which is to be a stored record of all of the voter's final vote selections and to be the voter's casted vote used for vote tabulation, an accuracy of data to be cast is confirmed based at least in part on a comparison of the first data set and the second data set. (claim 1)

generating a cast vote record indicating the voter's at least one vote selection, the cast vote record being a stored record of all of the voter's final vote selections, wherein, prior to generating any cast vote record which is to be a stored record of all of the voter's final vote selections, an accuracy of data to be cast is confirmed based at least in part on a comparison of the first data set and the second data set. (claim 15)

(2) generate a cast vote record which is to be a stored record of all of the voter's final vote selection indicating the voter's at least one vote selection based on the first data set and which is to be the voter's casted vote used for vote tabulation (claim 29(f))

wherein, the processor is further configured such that prior to generating the cast vote record which is to be a stored record of all of the voter's final vote selections and to be used for vote tabulation, an accuracy of data to be cast is confirmed based at least in part on a comparison of the first data set and the second data set. (claim 29h)

confirming an accuracy of the at least one vote selection of the voter based at least in part on a comparison of the first data set and the second data set; after confirming an accuracy of the at least one vote selection, generating a cast vote record which is to be a stored record of all of the voter's final vote selections and which is to be the voter's casted vote used for vote tabulation, the cast vote record indicating the voter's at least one vote selection as determined by the first data set; the cast vote record being generated after the comparing the first data set and the second data set (claim 34)

254. This limitation, in its various forms, requires that the CVR be generated after the accuracy of the data set used to generate the CVR has been confirmed by the comparison of the "first data set" and the "second data set." That comparison was addressed in the preceding limitation section and is disclosed in Nadaf. Claim 34 specifies that the CVR must "indicat[e] the voter's at least one vote selection as determined by the first data set." Claim 29 similarly requires that the CVR be "based on the first data set." Claims 1 and 15 do not specify the data set from which the CVR must be generated. Claims 1, 29, and 34 require that the CVR be "the voter's casted vote used for vote tabulation."

255. As established above, Brockhouse discloses a system in which a CVR used for tabulation is generated from the OCRed (first) data set. Nadaf discloses a voting system that generates a CVR after a "comparative audit" is performed between the OCR dataset and data from the decoded barcode. As the Board held in the '966 PGR, "the result of Nadaf's comparative audit—the CVR—is 'generated from the' OCR-scan results, as claimed." Ex. 1015 at 48 (rejecting PO's argument "that Nadaf's equipment 19 does not generate the CVR based on the OCR-created data set."). This comparison of data sets and generation of the CVR in Nadaf is performed by equipment 19 as part of the vote counting and audit process. Ex. 1007 at 19:1-15. The CVR used for tabulating the election is

generated by equipment (1) of Nadaf, which is a direct-recording electronic voting machine (voting machine). *Id*. at 10:13-16; 15:8-15.

256. The temporal limitation of limitations 1(g), 15(g), 34(g), 29(f), 29(h) of the '319 Patent requires that the CVR be generated **after** the comparison of the data sets and, in claims 1, 29, and 34, that the CVR must be the CVR used for tabulating the election.

257. The Examiner did not consider the combination of: (1) Brockhouse, which, as the Board previously confirmed, used the OCR data set to generate the CVR used for tabulation (Ex. 1015 at 16-17), and (2) Nadaf, which confirmed the accuracy of the OCR data set used to generate a CVR by comparing it to the encoded data of the bar code before generating that CVR, as the Board held. *Id*. at 44-47 ("…Nadaf's comparative audit generates 'a cast vote record,' as recited in claims 6, 23, and 29."). *See also id*. at 74 ("Patent Owner argues that the Nadaf does not disclose 'generating a cast vote record from the OCR data set.' We disagree with that argument …"). Nor did the Examiner consider Schneier, which teaches that a hash value comparison can be performed at any time to confirm that accuracy and authenticity of a printed document. Had the Examiner considered these three references together, the Challenged Claims would not have issued.

258. As a POSITA would have known that OCR processes are error-prone, and given the importance of ensuring that a CVR is accurate in an official election,

a POSITA would have been motivated to implement safeguards in Brockhouse's systems and processes to ensure the OCR data set used to generate a CVR was accurate and authentic before tabulating an election using that CVR. Nadaf discloses that one solution is to compare the OCR data to the encoded data in the barcode. Ex. 1007 at 19:7-9 ("comparative audit"). Such a solution would have been particularly apt and inexpensive to incorporate into the Brockhouse system, which already had the ability to: (1) print the voter's selections on the PVR in voter readable text; (2) encode and print the voter's vote in a barcode form on the PVR; (3) perform OCR on the scanned voter readable text; and (4) scan and decode the bar code. *See* Ex. 1004, Fig. 6. Adding Nadaf's comparison functionality to Brockhouse would have required nothing more than the combination of familiar elements according to known methods to yield predictable results.

259. Schneier confirms that additional voting safeguards can be put in place by using digital signatures and hash functions to ensure the accuracy and integrity of the PVR. The use of hash functions to confirm the accuracy of the OCR dataset used to generate the CVR is clearly within the scope of the comparison requirements of the Independent Claims. For example, claim 18, which depends from claim 15, requires "confirming an accuracy of an optical character recognition (OCR) by comparing a first hash produced from the first data set to a second hash, wherein the second hash is at least part of the encoded data."

Claim 35, which depends from claim 34, similarly requires that "comparing the first data set to the second data set [in claim 34] comprises comparing a first hash produced from the first data set to a second hash extracted from the encoded data on the printed vote record."

260. Nadaf teaches using an "Elliptic Curve Digital Signature Algorithm" ("ECDSA"). Ex. 1007 at 5:10-15. Nadaf also teaches that two bar codes (16) and (17) will be printed on the PVR and each will "provide a digital signature, in this case related to the text of the vote printed on the [PVR]." *Id*. at 14:15-18 (emphasis added). As noted above at ¶ 95, a step of the ECDSA is computing a hash function. Equipment 19 in Nadaf subsequently "extract[s] and verif[ies] the digital signatures" in the bar codes. Ex. 1007 at 19:7-9. To verify the digital signature "related to the text of the vote" printed on the PVR necessarily requires that the text of the vote—i.e. the OCR data set—be subjected to the hashing algorithm in ECDSA. *See* Ex. 1007 at 14:15-18.

261. Schneier explains that the "point" of a hash function is "to fingerprint the pre-image" or "fingerprinting files." Ex. 1009 at 30-31. Scheier explains that using a hash function to confirm the accuracy and integrity of a printed document can be performed at any time, using financial transactions as an example. Schneier explains that in such transactions, "you don't want a withdrawal of $100 to turn into a withdrawal of $1000 somewhere in the network." *Id*. at 31. In the context

of Brockhouse and Nadaf, this "pre-image" is the PVR and, more specifically, the voter's vote selections as represented in the OCR dataset. A POSITA would be motivated to use the hash function to confirm the accuracy of the data set used to generate the CVR to be used as the "voter's casted vote" and to verify the authenticity of the PVR itself given, again, the known and obvious importance of getting the vote selections accurately recorded and submitted for tabulation in any election.

262. In the '966 PGR FWD, the Board held that a POSITA would have been motivated to use hash functions to "further improve security because it would provide an additional assessment of the ballot's integrity." Ex. 1015 at 67-70. As Schneier explained in 1996, "[h]ash functions have been used in computer science for a long time." Ex. 1009 at 30.

263. The PVR in both Brockhouse and Nadaf include two versions of the voter's vote selections—(1) voter readable text that is then OCR'd and (2) data encoded in the barcode. It would have been obvious to a POSITA using either system to confirm the accuracy of the OCR process used to generate the CVR as is taught by Nadaf given that OCR processes were known to be error-prone. Schneier confirms that a long-known method to do so, as also taught by Nadaf, is use of a hash function.

7. Limitation 34(i)

tabulating an election utilizing the cast vote record before vote auditing.

264. The final step of claim 34 merely requires that an election be tabulated using the cast vote record before any audit is conducted. This is the standard practice in elections, and thus plainly would have been obvious to a POSITA at the time of the invention. Indeed, before the vote is tabulated there is nothing to audit, and there would be no point in producing CVRs if the election were to be tabulated using PVRs.

265. Thus, the independent claims would have been obvious to a POSITA at the time of the invention over Brockhouse combined with Nadaf and Schneier. The claims do not appear patentably distinct from those already found unpatentable by the Board in the '966 PGR. Merely injecting a temporal limitation as to when the CVR is created is nothing more than the application of known techniques to a known device to yield a predictable result. The independent claims are therefore not patentable.

C. Dependent Claims 2-14, 16-20, 23-27, 31, 35, 39 and 40 Are Unpatentable as Obvious

266. The dependent Claims do not add anything to the independent Claims that would not have been obvious to a POSITA at the time of the invention.

1. Claims 2-3, 5-6, 16 – "Encoded Data"

267. Claims 2-3 and 5-6 depend ultimately from claim 1 and impose encoding requirements. Claim 1 does not require that the PVR include encoded data or that the second data set be generated from such encoded data. Such limitations are found in the dependent claims. Claim 2 requires that the PVR include "encoded data based at least in part on the voter's at least one vote selection" and that the "second data set is generated at least in part from the encoded data." Claim 3 requires that the encoded data of claim 2 be electronically captured. Claim 5 depends from claim 4 (which depends from claim 1) and, as in claims 2 and 3, requires that the PVR include "encoded data based at least in part on the voter's at least one vote selection" and that the "encoded data" is scanned as part of the "electronically capturing" step of claim 1. Claim 6 depends from claim 5 and requires that the "encoded data" is contained in a "visual representation" on the PVR. Claim 16 depends from independent claim 15 and, like claim 6, requires that the "encoded data" be contained in a "visual representation" on the PVR.

268. A POSITA would have known that a barcode is a "visual representation" of encoded data. It is "visual" because it can be seen and scanned and is "encoded" because it is not human-readable.

269. As discussed above at ¶¶ 85 and 200-205, both Brockhouse and Nadaf include "encoded data," which includes the voter's vote selections, in the form of a

barcode on the PVR. Further, the '319 Patent acknowledges that prior art systems included a barcode on the PVR that was "encoded with the voter's vote selections." *Id*. at 1:52-59.

270. Re Nadaf, see Ex. 1007, Fig. 4 and, *e.g.*, 14:7-14 ("The ballot (14) will also show the **complete vote by the voter encoded in a two-dimensional bar code**, which will also contain the digital signatures of the Elections Judge and the other institution auditing the process (15)") (emphasis added). Re Brockhouse, *see* Ex. 1004, Fig. 6 and, *e.g.*, at [0053], [0106] ("Printer 72 prints on activation card 20 the master barcode 110, **vote selection barcodes 112**, **and vote selections 114 corresponding to the vote selections made by the voter**, as shown in FIG. 6") (emphasis added). Also, Brockhouse and Nadaf each teach using a scanner to electronically capture the voter readable text.

271. Nadaf further teaches scanning the PVR and comparing the OCR dataset with the encoded data in the barcode. Nadaf explains that the ballot can be inserted into an "optical reader" (a scanner) that scans the printed ballot and "compar[es] the text vote information to the vote information encoded into the bar code." Ex. 1007 at 19:7-9. Nadaf thus discloses electronically capturing the encoded data.

272. Therefore, claims 2-3, 5-6 and 16 would have been obvious to a POSITA at the time of the invention over Brockhouse, Nadaf, and Schneier.

2. Claim 4

273. Claim 4 depends from claim 1 and adds, "wherein the electronically capturing information from the printed vote record comprises electronically scanning the voter readable text." Such electronic scanning of the PVR is disclosed in both Brockhouse and Nadaf, as discussed above in ¶¶ 200-204 (Brockhouse) and 271 (Nadaf).

274. Therefore, claim 4 would have been obvious to a POSITA at the time of the invention over Brockhouse, Nadaf and Schneier.

3. Claims 7-9, 12-14 – "Encoded Data"

275. Claim 7 requires that the information captured from the PVR include voter readable text indicating a voter's vote selection and unspecified "other information." Claim 8 requires that the "other information" of claim 7 be contained in a "bar code." Claim 9 requires that the "second data set" be based at least in part on the "other information" of Claim 7.

276. Claim 12 depends from claim 11 and, like claim 7, requires that the information captured from the PVR also include "other information." Claim 13 requires that the "other information" of Claim 12 be presented in a barcode, and Claim 14 requires that the "second data set" be based at least in part on the "other information" of Claim 12.

277. The phrase "other information" does not appear in the specification of the '319 Patent. The '319 Patent does refer to "additional information" such as a "sequence number data affiliated with a candidate, … line number data affiliated with a contest, and/or the contest name itself." Ex. 1001 at 5:30-34. The Board held in the '966 PGR that Brockhouse and Nadaf each disclose the capture of "additional information" on the PVR. Ex. 1015 at 32-34, 78-80.

278. Therefore, claims 7-9 and 12-14 would have been obvious to a POSITA at the time of the invention over Brockhouse, Nadaf and Schneier.

4. Claims 11, 23, 39, 40 – "Tabulation" and "Audit"

279. Claim 11 depends from claim 1 and adds, "wherein the cast vote record provides the voter's sole casted vote used for vote tabulation." The same limitation is found in claims 23 and 40. All elections involve a tabulation step, or there would be point in holding the election. Use of the CVR as the sole record for tabulating an election is disclosed in both Brockhouse.

280. Brockhouse teaches that the "data set" created by utilizing OCR on the scanned PVR is used to generate a cast vote record. More specifically, Brockhouse discloses a device that "permanently stores the cast vote record for each paper ballot or activation card 20, as well as the image of each paper ballot or activation card 20." Ex. 1004 at [0117]. Brockhouse also discloses that "the electronically stored voting selections are tabulated by universal voting station 12,

and the cast vote records are transferred to a central site in any suitable manner known in the art." *Id*. at [0133]. As was well-known, tabulation was performed at the "central site."

281. Claim 39 requires that the PVR be used for auditing the election. Using PVRs for audits has long been known in the art. Audits are required, for example, by Section 301(a)(2) of HAVA (42 U.S.C. 15461): "The voting system shall produce a permanent paper record with a manual audit capacity for such system." Nadaf and Brockhouse both disclose such use of PVRs. *See*, *e.g*., Ex. 1004at [0056] ("The activation card 20 including the master barcode 110, vote selection barcodes 112, and vote selections 114 serves as a voter verifiable, auditable record of a voter's voting selections."); *id*.at [0088] ("Also, the storage device or removable USB flash drives may be used to store the images of the scanned ballots and activation cards 20, which may be accessed at a later time for audit purposes. The storage device or removable USB flash drives may further be used to store a back-up copy of an electronic audit log, which may be removed after the election for transport to election headquarters.); Ex. 1007 at 18:9-14 ("On the interior, the equipment (19) has an optical OCR and QR code reader and a CPU 10 (25) and packaging devices (26), connected, on the other side, to an output (27) for the packaged ballots that will receive RFID identification to be applied by the labeler (28). The equipment (19) will be supplied with the information conveyed to

the independent storage urn (11), or by the printed verification ballots (14) with a seal, in an auditing process, with various tasks carried out in the same mechanically automated routine.")

282. Therefore, claims 11, 23, 39, and 40 would have been obvious to a POSITA at the time of the invention over Brockhouse, Nadaf, and Schneier.

5. Claims 17, 18, 24, 25, 31, 35 – "Hashes"

283. Each of these claims requires the use of a "hash" to confirm the accuracy of the OCR process used in independent claims 15, 29 and 34. Claims 17 and 24 require only that the OCR accuracy be confirmed by using a first hash produced from the first data set. Claims 17 and 24 do not specify how the hash is used to confirm accuracy.

Claims 18 and 25 specify that the "first hash" is compared to a "second hash" of "at least part of the encoded data." Claim 31 requires that the processor of claim 29 be further configured to "generate an OCR hash from the first data set" and to compare that "OCR hash" to an "encoded hash extracted from the encoded data." Claim 35 similarly requires comparing the first hash and the second hash as part of the step of "comparing the first data set to the second data set" in independent claim 34.

284. As discussed above at ¶ 233, Schneier teaches that one-way hash functions can be used to verify the accuracy and integrity of a printed document.

Ex. 1009 at 30-31, 38. Nadaf similarly teaches the use of ECDSA, which also uses a hash function. Ex. 1007 at 5:10-15. Nadaf further teaches that two bar codes (16) and (17) will be printed on the PVR and each will "provide **a digital signature**, in this case **related to the text of the vote printed on the [PVR].**" Ex. 1007 at 14:15-18 (emphasis added). Equipment 19 in Nadaf subsequently "extract[s] and verif[ies] the digital signatures" in the bar codes. Ex. 1007 at 19:7-9. To verify the digital signature "related to the text of the vote" printed on the PVR necessarily requires that the text of the vote—*i.e.* the OCR data set—be subjected to the hashing algorithm in ECDSA.

285. Therefore, claims 17, 18, 24, 25, 31, and 35 would have been obvious to a POSITA at the time of the invention over Brockhouse, Nadaf, and Schneier.

6. Claims 19 and 26 – Accuracy of the OCR Process

286. Claims 19 and 26 require that the comparison of the first data set and a second data set be used to confirm the accuracy of the OCR process. This is done by confirming that the at least one vote selection in the first data set (OCR) matches the at least one vote selection in the second data set (encoded data or barcode). This limitation would have been obvious to a POSITA at the time of the invention.

287. As established above in ¶¶ 71-72, 227, 230, 248-249 and 258, a POSITA would have known that OCR processes are error prone. A POSITA using

the voting systems and processes disclosed by Brockhouse, in which the CVR is generated from the OCR dataset resulting from the scan of the voter readable text, would have been motivated to implement known error correction processes and safeguards to ensure the accuracy of that dataset. One such known method is taught by Nadaf, which discloses comparing the OCR dataset and the encoded data to confirm that accuracy of the vote record. Ex. 1007 at 19:1-15. Brockhouse includes both the voter readable text and the barcode on its PVR, and scanning both and comparing the resulting datasets would have been nothing more than applying known techniques to known devices to yield a predictable result.

288. Therefore, claims 19 and 26 would have been obvious to a POSITA at the time of the invention over Brockhouse, Nadaf, and Schneier.

7. Claims 20 and 27 – CVR Based on the First Data Set

289. Claims 20 and 27 each requires that the "cast vote record is based on the first data set" of Claim 15. This limitation is similar to the limitations of independent claims 29 and 34, which require that the CVR is based on the "first data set." For the reasons explained above regarding claims 29 and 34, this limitation would have been obvious to a POSITA at the time of the invention based on the combination of Brockhouse, Nadaf, and Schneier.

290. In conclusion, claims 1-20, 22-27, 29, 31, 34, 35, and 39-40 would have been obvious to a POSITA at the time of the invention over Brockhouse, Nadaf, and Schneier.

XII. GROUND 3: CLAIMS 21, 22, 28, 30, 32, 33, AND 36-38 ARE INVALID UNDER 35 U.S.C. § 112

291. I defined these claims previously as the "Recursive Claims."

292. The Recursive Claims lack written description because there is no description at all in the intrinsic record, going all the way back through the chain of applications to the earliest provisional, of any "recursive" process for doing anything. In fact, the words "recursive" and "recursively" do not appear anywhere in the specifications of any patents in the family listed at Ex. 1001 at 1:5-19, which I will refers to as the "'319 Family". The term "recursively" only appears in the claims of patents 11,004,292, 11,830,294, and 12,125,319, and in the claims of abandoned application 17/225,357.

293. Because a POSITA would have no reasonably certain understanding of the term "recursively modifying" in the context of the '319 Patent and there is no description of any recursive process in the specification, a POSITA would not be able to make and use the inventions of the Recursive Claims. Therefore, the Recursive Claims lack written description and are not enabled.

294. Much hinges on the meaning of the term "recursively." The '319 Family specifications provide no lexicography because the word "recursively" is

never used. I therefore rely on its plain and ordinary meaning to a POSITA, as explained above in the "Claim Construction" section at ¶¶ 135-145.

295. Nothing in the '319 Family discloses, or even hints at, any procedure calling itself, despite the use of "recursively modifying" in the claims. This is true both for "recursively modifying an OCR process" and "recursively modifying a first data set. No recursion is disclosed, and a POSITA would not have understood the inventors of the '319 Patent to have been in possession of any recursive invention.

296. A POSITA would not understand the scope of "recursively modifying" in the Recursive Claims because the phrase "recursively modifying" is meaningless in the context of the '319 Patent. There is no disclosure whatsoever of modifying an OCR process at all, let alone recursively. Further, there is no mention in the specification of "modifying" a data set. Neither the words "modify" or "modifying" not appear in the specification. The closest it comes to modification is the description of block 445 in Fig. 4 at 7:52-58:

> If there are valid alternatives to try at step 455, the workflow proceeds to step 440 it is determined if the number of contests with an alternate is under a threshold. If the answer is no at step 440, 55 workflow to step 420 where the PVR is rejected. If the answer is yes at step 440, workflow proceeds to step 445 where alternates are swapped in.

However, swapping in alternates is not a recursive modification.

297. A POSITA would find no written description of the specifics of recursively modifying either an "OCR process" or a "dataset." Even though a

POSITA would know what "recursively" means, the POSITA would have no idea how to implement a recursive algorithm for modifying an OCR process or a data set and would thus find no guidance in the specification of how make and use the inventions of the Recursive Claims. For these reasons, the Recursive Claims are invalid under 35 U.S.C. § 112 for lack of written description, and lack of enablement.

XIII GROUND 4: IN THE ALTERNATIVE, CLAIMS 30, 32, 33, 36, 37, 38 ARE INVALID AS OBVIOUS OVER BROCKHOUSE IN VIEW OF NADAF, SCHNEIER AND HEILPER

298. Claims 30, 32, 33, 36, 37, and 38 are among the Recursive Claims and are invalid for lack of written description and enablement based on a proper construction of "recursively modifying," as shown in Ground 3.

299. In the event the Board does not construe "recursively modifying" as urged in ¶¶ 135-147, but construes it to mean "iteratively modifying," a construction I believe to be incorrect, then Recursive Claims 21, 22, and 28 would still be invalid for lack of written description and enablement because there is no disclosure whatever of modifying an OCR process, either recursively or iteratively, in the '319 Patent, and a POSITA would have no idea how to implement such a modification.

300. Claims 30, 32, 33, 36, 37, and 38, however, do not require recursively modifying an OCR process, but simply require recursively modifying the first data set.

301. If "recursively modifying" is construed to mean "iteratively modifying," then such iterative modification is described and enabled. Basically, the '319 Patent teaches successively correct entries in the first data set by minimizing the Levenshtein distance between the entry and elements of a dictionary. Ex. 1001 at 2:11-42; 7:46-63.

302. However, "iteratively modifying" an OCR'd data set was conventional, and was taught, for example, in Heilper. As explained in ¶ 227, above, Heilper discloses comparing successive OCR'd words to a dictionary and discloses use of the same Levenshtein algorithm used in the '319 Patent. Ex. 1005 at 1:11-41; 7:46-63. Comparing successive OCR'd words to a dictionary for correction is "iteratively modifying" the first data set as described in the '319 Patent.

303. A POSITA, aware of the fact that OCR is error-prone, would have beneficially looked to Heilper for correction of OCR errors. Given the importance of ensuring that a cast vote record is accurate in an official election, a POSITA in 2018 (the earliest possible priority date for the '319 Patent) would have been motivated to incorporate the known error correction safeguards disclosed in

Heilper, such as the use of a dictionary, with the common OCR procedures utilized in Brockhouse. One of ordinary skill in the art would have further known that the cast vote record should be based on an error-corrected OCR data set, A POSITA would have expected success at the combination because Heilper's error-correction techniques apply to any sort of OCR'd data and it would have been straightforward to implement them in combination with Brockhouse and Nadaf.

304. I note that the Board in the '966 PGR held in its Final Written Decision that a POSITA would have been motivated to combine Heilper with each of Brockhouse and Nadaf and would have had a reasonable expectation of success in doing so. Ex. 1015 at 17-28, 34, 58-60, 73-76.

305. Therefore, claims 30, 32, 33, 36, 37, and 38 are invalid as obvious over Brockhouse, Nadaf, Schneier, and Heilper.

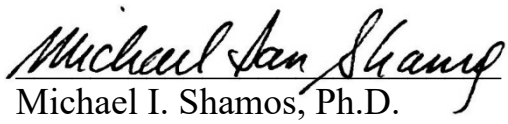
XIX. CONCLUDING STATEMENTS

306. I hereby declare that all statements made herein of my knowledge are true, and that all statements made on information and belief are believed to be true, and 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.

307. I reserve the right to supplement my opinions in the future to respond to any arguments that Petitioner raises and to take into account new information as it becomes available to me.

308. 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 the 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 remotely within the United States during the time allotted for cross examination.

Executed July 16, 2025 at Pittsburgh, Pennsylvania.



Michael I. Shamos, Ph.D.

APPENDIX 1 – MATERIALS CONSIDERED

Exhibit No.	Exhibit Description
1001	U.S. Patent No. 12,125,319
1002	File History for U.S. Patent No. 12,125,319
1004	U.S. Patent Application Publication 2014/0231513 ("Brockhouse")
1005	U.S. Patent No. 7,406,201 ("Heilper")
1006	Brazilian Patent Application No. BR102013018558A2
1007	Certified Translation of BR102013018558A2 ("Nadaf")
1008	U.S. Patent No. 9,401,059 ("Backert")
1009	Schneier, B., "Applied Cryptography" (Second Ed.), John Wiley & Sons, Inc. (1996) ("Schneier")
1010	U.S. Patent 7,080,779 ("Cummings")
1011	U.S. Patent No. 3,609,685 ("Deutsch")
1012	U.S. Patent 6,250,548 ("McClure")
1013	U.S. Patent No. 5,764,799 ("Hong")
1014	U.S. Patent No. 9,361,531 ("Stella")
1015	'966 PGR Final Written Decision (PGR 2020-00031, Paper 29, Sept. 1, 2001)
1016	File History For U.S. Application No. 17/483,627 (Excerpted)
1017	2015 Voluntary Voting System Guidelines. Version 1.1 ("VVSG")
1018	RESERVED
1019	Keller et al., *A PC-Based Open-Source Voting Machin with an Accessible Voter-Verifiable Paper Ballot*, Proceedings of the 2005 USENIX Annual Technical Conference ("Keller")
1020	U.S. Patent No. 5,377,099 ("Miyagawa")
1021	Kim et al, *Improved Support for Machine-Assisted Ballot-Level Audits*, 1 USENIX Journal of Election Technology and Systems (JETS) 88 (2013) ("Kim")
1022	U.S. Patent Application Publication 2006/0041468 ("Reardon")
1023	U.S. Patent Application Publication 2009/0166417 ("Dammann")
1024	U.S. Patent Application Publication 2009/0289115 ("Chung")
1025	U.S. Patent Application Publication 2019/0213820 ("Sebes")
1026	U.S. Patent No. 7,306,148 ("Morganstein")

1027	RESERVED
1028	U.S. Patent No. 2,612,994 ("Woodland")
1029	U.S. Patent No. 5,726,435 ("Hara")
1030	Ashford, *QR Codes and Academic Libraries: Reaching Mobile Users* (2010) ("Ashford")
1031	Barrera et al., *Optical encryption and QR codes: Secure and noise-free information retrieval*, 21(5) Optics Express 5373 (2013) ("Barrera")
1032	U.S. Patent Application Publication 2010/0114674 ("Daza Fernandez")
1033	U.S. Patent No. 9,165,417 ("Vallez")
1034	U.S. Patent Application Publication No. 2014/0012635 ("Joyce")
1035	U.S. Patent No. 10,002,481 ("Seibel")
1036	U.S. Patent No. 10,147,259 ("Dvorak")
1037	WO 01/020562
1038	Krawczyk et al., *IETF Request for Comments 2104: HMAC: Keyed-Hashing for Message Authentication* (1997) https://tools.ietf.org/pdf/rfc2104.pdf ("Krawczyk")
1039	Essex & Hengartner, *Hover: Trustworthy Elections with Hash-Only Verification*, IEEE Security and Privacy, September/October 2012 ("Essex")
1040	U.S. Patent Application Publication No. 2018/0102013 ("Spanos")
1041	U.S. Patent No. 7,729,991 ("Rodriguez")
1042	WO 04/038632 ("Boldin")
1043	U.S. Patent Application Publication No. 2011/0202464 ("Carbullido")
1044	U.S. Patent No. 6,873,966 ("Babbitt")
1045	Shamos, *Electronic Voting Glossary* (2011) http://euro.ecom.cmu.edu/people/faculty/mshamos/Glossary.pdf
1046	FIPS PUB 186-4 – Digital Signature Standard (DSS) (July 2013)
1047	U.S. Reissue Patent No. RE40,449 ("Provitola")
1048	Pires Declaration
1049	*Microsoft Computer Dictionary* (2002), definition of "recursion"
1050	Barron's *Dictionary of Computer and Internet Terms* (10th. Ed., 2009), definition of "recursion"

1051	Rigdon's *Dictionary of Computer and Internet Terms* (1st edition 2016) definition of "recursion"
1052	U.S. Patent Application Publication US2015/0279139A1 ("Kincaid")

Appendix B – '319 Patent Independent Claims

1(preamble) A method for electronic voting using printed vote records, comprising:	15(preamble) A method for electronic voting using printed vote records, comprising:	29 (preamble) An electronic voting system for using printed vote records, comprising:	34 (preamble) A method for electronic voting using printed vote records, comprising:
1(a) generating a printed vote record of at least one vote selection of a voter; 1(b) providing, on the printed vote record, voter readable text indicating the voter's at least one vote selection;	15(a) generating a printed vote record of at least one vote selection of a voter; 15(b) providing, on the printed vote record, voter readable text indicating the voter's at least one vote selection;	29(a) a printer configured to generate a printed vote record of at least one vote selection of a voter, 29(b) the printed vote record including voter readable text indicating the voter's at least one vote selection;	34(a) generating a printed vote record of at least one vote selection of a voter; 34(b) providing, on the printed vote record, voter readable text indicating the voter's at least one vote selection;
1(c) electronically capturing information from the printed vote record;	15(c) electronically capturing first information from the printed vote record;	29(c) a scanner configured to (1) electronically capture first information from the printed vote record, the first information including the voter readable text, and	34(c) electronically capturing first information from the printed vote record;
1(d) using optical character recognition (OCR) on at least a portion of the electronically captured information to generate a first data set, the first data set based at least in part on the voter readable text indicating the voter's at least one vote selection;	15(d) using optical character recognition (OCR) on the first information to generate a first data set, the first data set based at least in part on the voter readable text indicating the voter's at least one vote selection;	29(e) a processor configured to (1) use optical character recognition (OCR) on the first information to generate a first data set based at least in part on the voter readable text indicating the voter's at least one vote selection,	34(d) using optical character recognition (OCR) on the first information to generate a first data set, the first data set based at least in part on the voter readable text indicating the voter's at least one vote selection;

1(f) the second data set obtained from the printed vote record;	15(e) electronically capturing second information from the printed vote record, to generate a second data set, the second information comprising encoded data;	29(d) (2) electronically capture second information from the printed vote record, the second information comprising encoded data; 29(g) (3) generate a second data set from the second information, and	34(e) electronically capturing second information from the printed vote record, to generate a second data set, the second information comprising encoded data;
1(e) comparing the first data set to a second data set,	15(f) comparing the first data set to a second data set; and	*See* 29(h) Bold Emphasized Language	34(f) comparing the first data set to a second data set;

1(g) generating a cast vote record, which is to be a stored record of all of the voter's final vote selections and to be the voter's casted vote used for vote tabulation, the cast vote record indicating the voter's at least one vote selection, wherein, prior to generating any cast vote record which is to be a stored record of all of the voter's final vote selections and to be the voter's casted vote used for vote tabulation, an accuracy of data to be cast is confirmed based at least in part on a comparison of the first data set and the second data set.	15(g) generating a cast vote record indicating the voter's at least one vote selection, the cast vote record being a stored record of all of the voter's final vote selections, wherein, prior to generating any cast vote record which is to be a stored record of all of the voter's final vote selections, an accuracy of data to be cast is confirmed based at least in part on a comparison of the first data set and the second data set.	29(f) (2) generate a cast vote record which is to be a stored record of all of the voter's final vote selection indicating the voter's at least one vote selection based on the first data set and which is to be the voter's casted vote used for vote tabulation, and 29(h) wherein, the processor is further configured such that prior to generating the cast vote record which is to be a stored record of all of the voter's final vote selections and to be used for vote tabulation, an accuracy of data to be cast is confirmed based at least in part on a **comparison of the first data set and the second data set.**	34(g) confirming an accuracy of the at least one vote selection of the voter based at least in part on a comparison of the first data set and the second data set; 34(h) after confirming an accuracy of the at least one vote selection, generating a cast vote record which is to be a stored record of all of the voter's final vote selections and which is to be the voter's casted vote used for vote tabulation, the cast vote record indicating the voter's at least one vote selection as determined by the first data set; the cast vote record being generated after the comparing the first data set and the second data set; and
			34(i) tabulating an election utilizing the cast vote record before vote auditing.

APPENDIX C

Resume of Michael Ian Shamos

Current to July 16, 2025

Education

A.B. (1968) Princeton University (Physics). Thesis: "Gravitational Radiation Reaction." Advisor: John A. Wheeler.

M.A. (1970) Vassar College (Physics). Thesis: "An Absorber Theory of Acoustical Radiation." Advisor: Morton A. Tavel.

M.S. (1972) American University (Technology of Management).

M.S. (1973) Yale University (Computer Science).

M.Phil. (1974) Yale University (Computer Science).

Ph.D. (1978) Yale University (Computer Science). Thesis: "Computational Geometry". Thesis committee: David Dobkin, Martin H. Schultz, Stanley C. Eisenstat.

J.D. (1981) Duquesne University, *cum laude*.

Foreign Languages

French, Russian (good reading and technical translation skills, fair conversational ability).

Academic Experience

Distinguished Career Professor, Language Technologies Institute and Software and Social Systems Department, School of Computer Science, Carnegie Mellon University (2001-)
Principal Systems Scientist (1998-2001)
Principal Lecturer (2002-2003). Teaching Professor (2003-)
Faculty, Tepper School of Business, Carnegie Mellon University (1999-2004).
Co-Director, Carnegie Mellon Institute for eCommerce (1998-2004)
Vice-Chair, University Research Council (2000-2002)
Director, eBusiness Technology degree program, Carnegie Mellon (2003-2018)
Director, M.S. in Artificial Intelligence and Innovation, Carnegie Mellon (2018-)
Affiliated Faculty, CMU Center for Informed Democracy and Social-cybersecurity (2021-)
Core faculty, Privacy Engineering degree program (2013-)
Director, Universal Library, Carnegie Mellon University (1998-)
Visiting Professor, Faculty of Engineering, The University of Hong Kong (2001-2021)
Adjunct Faculty, Carnegie Mellon University, Department of Computer Science (1981-1998)

Assistant Professor, Carnegie Mellon University, Departments of Computer Science and Mathematics (1975-81), Dept. of Statistics (1978-81).

Courses taught (Carnegie Mellon):
Algorithm Design and Analysis 15-451 (Comp. Sci.)
Intellectual Capital and its Protection 45-886 (MBA)
Ecommerce Technology 20-751 (MSEC program)
Electronic Payment Systems 20-753 (MSEC program), 96-774 (MSIT program)
Ecommerce Law and Regulation 46-840 (MSEC program)
Electronic Voting 17-803
Ubiquitous Computing, 96-761 (MSIT Program)
Electronic Payment Systems (MSIT Program)
Law of Computer Technology, 17-762/17-662/17-562 (2007-)
Artificial Intelligence and Future Markets, 11-561 (2018-)

Honors and Awards

Fellow, Society of the Sigma Xi (1974-83).

IBM Fellowship, Yale University (1974–75).

SIAM National Lecturer (1977–78).

Distinguished Lecturer (computer science), University of Rochester (1978); McGill University (1979).

Duquesne University Law Review (1980–81).

Black & White Scotch Achiever's Award (first annual, 1991, for contributions to bagpipe musicography).

Industry Service Award of the Billiard and Bowling Institute of America, 1996 (for contributions to billiard history).

Billiard Worldcup Association official referee (2001-)

Editorships

Editor-in-Chief, Journal of Privacy Technology (2003- 2006).

Member of Editorial Board, *Electronic Commerce Research Journal* (2000-).

Member of Editorial Board, *Pittsburgh Journal of Technology Law and Policy* (1999-2003).

Dr. Shamos has reviewed scientific papers for *Communications of the ACM*, *Mathematical Reviews*, *IEEE Computer*, *IEEE Transactions on Computers*, *Information Processing Letters*, *Journal of the ACM* and the *Journal of Computational Physics*.

Contributing Editor, *Billiards Digest* magazine (1990-).

Patents

Co-inventor with K. Srinivasan, U.S. Patent 7,330,839, "Method and System for Dynamic Pricing," issued February 12, 2008.

Co-inventor with K. Srinivasan, U.S. Patent 7,421,278, "Method and Apparatus for Time-Aware and Location-Aware Marketing," issued September 2, 2008.

Co-inventor with K. Srinivasan, U.S. Patent 7,747,465, "Determining the Effectiveness of Internet Advertising," issued June 29, 2010.

Co-inventor with K. Srinivasan, U.S. Patent 8,195,197, "Method and Apparatus for Time-Aware and Location-Aware Marketing," issued June 5, 2012.

Co-inventor with K. Srinivasan, U.S. Patent 8,280,773, "Method and Apparatus for Internet Customer Retention," issued October 2, 2012.

Co-inventor with K. Srinivasan, U.S. Patent 9,456,299, "Method and Apparatus for Time-Aware and Location-Aware Marketing," issued September 27, 2016.

Legal Experience

Special Counsel, Reed Smith LLP (2000-2003), electronic commerce law.

Shareholder, The Webb Law Firm (1996-2000), intellectual property law. Associate (1990-95).

Private practice of law (1987-90), intellectual property

Associate, law firm of Buchanan, Ingersoll, P. C. (1985-87)(now Buchanan Ingersoll & Rooney, PC), Emerging Companies Department.

General Counsel, Carnegie Group, Inc. (1983-85), artificial intelligence company.

Private practice of law (1981-83), computer law.

Bar Admissions

Supreme Court of Pennsylvania (1981–).

United States District Court for the Western District of Pennsylvania (1981–).

United States Patent and Trademark Office (1981–).

United States Tax Court (1982–).

United States Court of Appeals for the Armed Forces (1982–).

United States Court of Appeals for the Third Circuit (1982–).

United States Supreme Court (1985–).

United States Court of Appeals for the Federal Circuit (1985–).

Expert Witness

Dr. Shamos has served as an expert witness in multiple computer software and electronic voting cases. He has participated in the cases listed below. "D" indicates deposition testimony; "R" indicates report, declaration or affidavit; "T" indicates trial testimony.

Total: 402 cases, including 319 patent, 21 electronic voting, 23 trade secret, 13 copyright, 1 criminal.
Affidavits, reports or declarations submitted in 288 cases.
Deposed in 164 cases.
Testified at trial or hearing in 52 cases (22 jury trials).
Participated in 7 ITC investigations, 125 IPRs, 22 CBMs, 10 PGRs, and 10 reexams.

1. *C.W. Communications, Inc. v. International Research Service, Inc.*, Civil Action No. 84-890, (W.D. Pa. 1984), aff'd. Case No. 88-3331 (3d Cir., Oct. 31, 1988). Served as an expert for plaintiff publisher as to the fame of its "Computerworld" trademark. Result: permanent injunction entered against defendant. Judge McCune's Memorandum and Order states. "We accept the conclusion drawn by Dr. Shamos." Firm: Webb, Burden Robinson & Webb (now the Webb Law Firm). (D,T)

2. *E.F. Hutton, Inc. v. Gipson* (W.D. Pa. 1985). Served as an expert for defendant-counterclaimant physician as to fraud in the inducement by a computer hardware supplier. Plaintiff had provided capital financing for the purchase. Result: defendant was awarded compensatory damages + $250,000 punitive damages. (D,T)

3. *In re Comprehensive Business Systems*, 119 B.R. 573 (S.D. Ohio 1990). Served as an expert for a secured creditor in a bankruptcy case in which the creditor sought to obtain software still in development for which it had advanced over $2 million in funding. Dr. Shamos opined as to the value of the incomplete software. Result: the creditor was able to purchase the software from the Trustee for $67,500. The Court referred in its opinion to "the testimony of the eminent and impressive Dr. Shamos." (D,R,T)

4. *Levinson Steel Co. v. American Software, Inc. et al.*, Civil Action No. 96-282, W.D. Pa. (1996). Served as an expert for plaintiff in a case involving bad faith estimates of computer processing capacity resulting in delivery of an inadequate system. Result: settlement in favor of plaintiff in an undisclosed amount. Contact: Reed Smith LLP, 225 Fifth Ave., Pittsburgh, PA 15222. (D,R)

5. *ASE Limited v. INCO Alloys International, Inc.*, Civil Action No. 98-1266, (W.D. Pa. 1998). Served as an expert for defendant concerning breach of computer services contract by declaratory judgment plaintiff. Result: determination that defendant was free to seek services from a different vendor. Firm: Reed Smith LLP, 225 Sixth Ave., Pittsburgh, PA 15222. Attorney: Anthony Basinski, Esq. (D,T)

6. *Twentieth Century Fox Film Corp. v. iCraveTV*, 53 U.S.P.Q. 2d 1831 (W.D. Pa. 2000). Served as an expert for Plaintiffs concerning Internet technology used to stream video from U.S. TV stations through web sites in Canada. Result: TRO and preliminary injunction issued against defendants prohibiting continued infringement in the U.S. Firm: Reed Smith LLP. Attorney: Gregory Jordan, Esq. (T)

7. Invited testimony before the British House of Lords, Subcommittee B of the European Union Committee, April 20, 2000. Subject: European regulation of eCommerce. View testimony.

8. *Universal Studios, Inc. v. Reimerdes*, 111 F. Supp. 2d 294 (S.D.N.Y. 2000), aff'd. 273 F.3d 429 (2d Cir. 2001). Served as an expert for plaintiff movie studios concerning accused software for decrypting DVDs in the first case interpreting the Digital Millennium Copyright Act. Result: permanent injunction issued in favor of plaintiffs on August 17, 2000. Contact: William Hart, Esq., Proskauer Rose LLP. View testimony. View opinion. View appellate opinion. (D,T)

9. *MercExchange, L.L.C. v. eBay, Inc. et al.*, Case No. 2:01-CV-736 (E.D. Va. 2001). Served as an expert for defendant eBay in an infringement case concerning U.S. Patent 6,202,051 for Internet auctions. Following Dr. Shamos' reports, Defendants obtained a summary judgment of noninfringement of the subject patent. On the other patents, the case went to the U.S. Supreme Court, which ruled that injunctions are not automatic in patent cases. Contact: Tim Teter, Esq., Cooley LLP. (D,R)

10. *PowerQuest Corp. v. Quarterdeck Corp. et al.*, Case No. 2:97-CV-0783 (D. Utah 1997). Served as an expert for plaintiff PowerQuest in an infringement case concerning U. S. Patents 5,675,769 and 5,706,472 for a method of resizing hard disk partitions. Dr. Shamos testified at the Markman hearing. Case settled when one of the defendants acquired plaintiff. Attorney: Gregg I. Anderson, Esq., formerly at Merchant & Gould, now an Administrative Patent Judge at the Patent Trial and Appeal Board. (R,T)

11. *Sightsound.Com Inc. v. N2K Inc. et al.*, C.A. 98-118 (W.D. Pa. 1998). Served as an expert for defendants, including a subsidiary of Bertelsmann AG, concerning validity of U.S. Patents 5,191,573 and 5,966,440 for distribution of digital audio via telecommunications lines. Case

settled. Firm: Parcher, Hayes & Snyder, (no longer in existence). Contact: Steven M. Hayes, Esq., Simmons Hanley Conroy, LLC, 112 Madison Ave., New York, NY 10016. (D,R)

12. *Freemarkets, Inc. v. B2eMarkets, Inc.*, C.A. 02-162-SLR (D. Del. 2002). Served as an expert witness for plaintiff concerning infringement of U.S. patents 6,216,114 and 6,223,167, concerning methods of conducting electronic auctions. Case settled two weeks after expert attended a demonstration of the accused product. Contact: D. Michael Underhill, Esq., Boies, Schiller & Flexner, LLP, Washington, DC.

13. *Lifecast.com, Inc. v. ClubCorp, Inc.*, AAA Case No. 71Y1170076301 (Dallas, TX). Served as an expert witness for respondent in a case alleging copyright infringement of Internet websites. Testified at arbitration. Result: Complainant's claims denied; award for respondent on counterclaims and for attorney's fees. Contact: Bill Whitehill, Esq., Gardere Wynne Sewell LLP, 1601 Elm St., Dallas, TX 75201. (T)

14. *IP Innovation LLC v. Thomson Learning, Inc. et al.*, Case H-02-2031 (S.D. Tex. 2002). Served as an expert for defendant The Princeton Review, Inc. concerning alleged infringement of U.S. Patent 4,877,404 relating to online delivery of educational courses. Summary judgment of non-infringement obtained for defendant after favorable Markman proceeding. Contact: Peter Vogel, Esq., Gardere Wynne Sewell LLP, 1601 Elm St., Dallas, TX 75201. (R)

15. *Starpay.com LLC et al. v. Visa International Service Association et al.*, Case 3-03-CV-976-L (N.D. Tex. 2003). Served as an expert for defendant Visa concerning alleged infringement of U.S. Patent 5,903,878 relating to online authentication of credit card customers. Dr. Shamos provided the court with a Markman tutorial in 2004 and a non-infringement and invalidity declaration in 2008. Case settled in February 2008. Contact: Stanley Young, Esq., Covington & Burling LLP, 333 Twin Dolphin Drive, Suite 700, Redwood Shores, CA 94065. (D,R,T)

16. *Safeclick LLC v. Visa International Service Association et al.*, Case C-03-5865 (N.D. Cal. 2003). Served as an expert for defendant Visa concerning alleged infringement of U.S. Patent 5,793,028 relating to online authentication of credit card customers. Summary judgment of noninfringement granted for Visa based on expert reports, affirmed after appeal to the Federal Circuit. Contact: Stanley Young, Esq., Covington & Burling LLP, 333 Twin Dolphin Drive, Suite 700, Redwood Shores, CA 94065. (D,R)

17. *Wells Fargo Bank Minnesota, NA et al. v. UBS Warburg Real Estate Securities, Inc.*, Case 02-2849 (192d Judicial District, Dallas Cty., Tex, 2002) and *LaSalle Bank, NA et al. v. UBS Warburg Real Estate Securities, Inc.*, Case 02-2899-G (134th Judicial District, Dallas Cty., Tex, 2002). Served as an expert for defendant UBS Warburg in an electronic discovery matter involving a case of first impression regarding Texas Discovery Rule 196.4 allocating costs of discovery of electronic records. Firm: Gardere Wynne Sewell LLP, 1601 Elm St., Dallas, TX 75201. Contact: Dawn Estes, Esq., Taber, Estes Okon Thorne & Carr PLLC, 3811 Turtle Creek Blvd., Suite 2000, Dallas, TX 75219. (D, R)

18. *American Association of People with Disabilities et al. v. Shelley et al.*, Case No. CV04-1526 FMC (PJWx) (C. D. Calif., 2004). Served as an expert for plaintiff AAPD, which has brought a claim against the California Secretary of State that requiring DRE voting machines to be equipped with audit trails violates the rights of disabled persons. Plaintiffs' application for TRO and preliminary injunction denied. Firm: Howrey LLP, (no longer in existence). Attorney John E. McDermott is now a Magistrate Judge in the Central District of California. (R)

19. *Paul Ware v. Target Corp.*, CA 4:03-CV-0243-HLM (N.D. Ga., 2003). Served as an expert for defendant Target Corp., a large retailer, in a case involving U.S. patent 4,707,592, claiming a method of conducting credit card sales. Case settled during Markman preparations. Contact: Thomas P. Burke, Esq., Ropes & Gray LLP, 1211 Ave. of the Americas, New York, NY 10036.

20. *Viad Corp., v. C. Alan Cordial et al.*, No. 03-1408 (W.D. Pa., filed 2003). Served as an expert for defendants in an action alleging misappropriation of trade secrets relating to software for automating certain aspects of the exhibit booth and trade show industries. Status: case settled immediately before trial, after plaintiff's unsuccessful Daubert challenge of Dr. Shamos. Contact: Barbara Scheib, Esq., Cohen & Grigsby, P.C., 11 Stanwix Street, Pittsburgh, PA 15222. (D,R,T)

21. *Schade et al. v. Maryland State Bd. of Elections et al.*, Case No. C0497297 (Cir. Ct. Anne Arundel Cty. Md., 2004). Served as an expert for defendants in a case challenging the decision of the Board of Elections not to decertify Diebold AccuVote system. Result: Plaintiff's motion for preliminary injunction denied, upheld on appeal. Judge Manck's opinion cites Dr. Shamos' testimony as follows: "the court finds Dr. Shamos, Defendants' expert, to be the true voice of reason and the most credible expert in this matter." The denial of preliminary injunction was upheld by the Maryland Court of Appeals, which commented extensively on Dr. Shamos' testimony in its opinion. Contact: Michael Berman, Esq., (formerly Maryland Deputy Attorney General), Rifkin, Weiner, Livingston, Levitan & Silver, LLC. (R,T)

22. *Wexler et al. v. Lepore et al.*, Case No. 04-80216 (CIV-COHN) (S.D. Fla. 2004) . Served as an expert for defendants, various Florida election supervisors against claim by U.S. Congressman Robert Wexler that use of DRE voting machines without paper audit trails violates the equal protection clause of the U.S. Constitution. Dr. Shamos testified on Oct. 19, 2004. The trial judge rendered judgment in favor of defendants on Oct. 25. Contact: Jason Vail, Esq., then Assistant Attorney General, Department of Legal Affairs, The Capitol, Tallahassee, FL, now at Allen Norton & Blue, PA. Opinion. (T)

23. *Siemens Information and Communication Networks, Inc. v. Inter-Commercial Business Systems, Inc.*, Civil Action 3-03CV2171-L (N.D. Tex. 2004). Served as an expert for defendant against claim of copyright infringement based on reverse-engineered firmware resident in telephone switching systems. Status: case settled shortly after the submission of Dr. Shamos's rebuttal report on non-infringement. Contact: Bill Whitehill, Esq., Gardere Wynne Sewell LLP, 1601 Elm St., Dallas, TX 75201. (R)

24. *Soverain Software LLC v. Amazon.com, Inc.*, C.A. No. 6:04-CV-14 (E.D. Tex. 2004). Served as an expert for plaintiff regarding asserted patents 5,708,780, 5,715,314 and 5,909,492,

relating to the shopping cart paradigm of electronic commerce. Status: settled in Sept. 2005 with Amazon paying $40 million to Soverain and taking a license under the patents in suit. Contact: Ognian Shentov, Esq., Jones Day, 222 E. 41st St., New York, NY 10017. (D,R)

25. *CollegeNET, Inc. v. The Princeton Review, Inc.*, Case '051205KI (D. Ore. 2005). Served as an expert for defendant The Princeton Review, Inc. concerning alleged infringement of U.S. Patent 6,460,042 relating to online delivery of educational courses. Case settled in December 2007. Contact: Peter Vogel, Esq., Gardere Wynne Sewell LLP, 1601 Elm St., Dallas, TX 75201. (R)

26. *CombineNet, Inc. v. VerticalNet. Inc.*, GD 05-018911 (Ct. Common Pleas, Allegheny Cty., PA). Served as an expert for plaintiff in an action for trade secret misappropriation relating to a system for conducting electronic auctions. Plaintiff won in arbitration. Contact: Mark Knedeisen, Esq., K&L Gates LLP, 210 Sixth Avenue, Pittsburgh, PA 15222-2613. (T)

27. *RealSource, Inc. v. Best Buy Co., Inc. et al.*, No. A04-CA-771-LY (W.D. Tex.). Served as an expert for defendant Lowe's Companies, Inc., against a claim of infringement of U.S. patent 5,732,136 relating to validation of point-of-sale debit card transactions. Provided a tutorial to the Court during Markman proceedings concerning debit card technology. Defendants won summary judgment of non-infringement, affirmed by the Federal Circuit. Defendants Lowe's settled and was not involved in the appeal. Contact: Michael S. Connor, Esq., Alston & Bird LLP, Bank of America Plaza, 101 South Tryon St, Suite 4000, Charlotte, NC 28280-4000. (R,T)

28. *DE Technologies, Inc. v. Dell, Inc. et al.*, No. 7:04-CV-00628 (W.D. Va.). Served as an expert for plaintiff DE Technologies, Inc., asserting a claim of infringement of U.S. patents 6,460,020 and 6,845,364, relating to a system for implementing international sales transactions. Case settled after and adverse summary judgment. However, the Court used Dr. Shamos' testimony in its opinion. Contact: David Marder, Esq., Robins Kaplan Miller & Ciresi LLP, 800 Boylston Street, 25th Floor, Boston, MA 02199. (D,R,T)

29. *Eaton Power Quality Corp. v. J.T. Packard & Associates*, No. 05 C 3545 (N.D. Ill. 2005). Served as expert for plaintiff in a claim of software copyright infringement involving a system for configuring industrial uninterruptible power supplies. Case settled in early 2007. Firm: Dewey & LeBoeuf. Contact: Keith P. Schoeneberger, Esq., Pasulka & Associates PC. (D,R)

30. *Taylor et al. v. Onorato et al.*, CA 06-481 (W.D. Pa 2006). Served as an expert for Commonwealth of Pennsylvania defendants in an action seeking to enjoin the use of electronic voting machines in Allegheny County, PA. Dr. Shamos testified at length in a preliminary injunction hearing held April 25-27, 2006 before Judge Lancaster. The injunction was denied on April 28. Suit was subsequently dropped by plaintiffs. Contact: Mark Aronchick, Esq., Hangley Aronchick Segal Pudlin & Schiller, One Logan Square, 18th & Cherry Streets, 27th Floor, Philadelphia, PA 19103. (T)

31. *FedEx Ground Package System, Inc. v. Applications International Corp.*, CA No. 03-1512 (W.D. Pa.). Served as an expert for defendant counterclaiming for copyright infringement and

trade secret misappropriation relating to software for maintaining occupational health and safety records. Dr. Shamos's testimony was excluded because he was unable to perform a side-by-side comparison of the original and accused works. Case has settled. Contact: Ronald Hicks, Esq., Meyer, Unkovic & Scott LLP, 1300 Oliver Bldg., Pittsburgh, PA 15222. (D,R)

32. *NetMoneyIN, Inc. v. Verisign, Inc. et al.*, Cv-01-441-TUC-RCC (D. Ariz.). Served as an expert for defendants Bank of America Merchant Services, Inc. and Wells Fargo Bank, N.A., who are accused of infringing claim 23 of U.S. patent 5,822,737, relating to an electronic payment system. Wells Fargo and Bank of America have settled. Contact: K&L Gates LLP, State Street Financial Center, One Lincoln Street, Boston, Massachusetts 02111-2950. (D,R)

33. *Contois Music Technology, LLC v. Apple Computer, Inc.*, 2:05-CV-163 (D. Vermont, filed Feb. 13, 2006). Served as an expert for plaintiff in an action alleging that the Apple iTunes software infringed U.S. patent 5,864,868, relating to a method for selecting music from an electronic catalog. Case settled after a favorable Markman order. Contact: John Rabena, Esq., Sughrue Mion PLLC, 2100 Pennsylvania Avenue, NW, Suite 800, Washington, DC 20037-3213.

34. *Banfield et al. v. Cortés*, 442 MD 2006 (PA Cmwlth. Ct.). Served as an expert for defendant Secretary of the Commonwealth of Pennsylvania in an action to compel the decertification of all electronic voting machines in Pennsylvania. In February 2008 Defendant successfully repelled an emergency motion for preliminary injunction. In August 2012, the Court denied Petitioners' motion for summary judgment, citing Dr. Shamos's expert report extensively. In October 2013, the Commonwealth Court granted summary judgment for the Secretary. The Pennsylvania Supreme Court affirmed on February 18, 2015. Contact: Steven E. Bizar, Esq., Buchanan Ingersoll & Rooney PC, Two Liberty Place, 50 S. 16th St., Philadelphia, PA 19102-2555. (D,R)

35. *Remote Inventory Systems, Inc. v. WESCO Distribution, Inc.*, AAA Case No. 55 171 00493 05 (Pittsburgh, PA). Served as an expert for respondent in a case alleging misappropriation of trade secrets in a computerized inventory system. Contact: Kirsten Rydstrom, Esq., Reed Smith LLP, 225 Fifth Ave., Pittsburgh, PA 15222. (D,R)

36. *SyncSort, Inc. v. Innovative Routines International, Inc.*, Civil Action No. 04-3623 (WHW) (D. New Jersey). Served as an expert witness for defendant in an action alleging misappropriation of trade secrets embodied in plaintiff's Unix sorting software. Dr. Shamos testified at a bench trial in January 2011. Case settled after an appeal to the Third Circuit was filed. Contact: David R. Fine, Esq., K&L Gates LLP, 17 N. Second Street, 18th Floor, Harrisburg, PA 17101-1507. (D,R,T)

37. *Digital Impact, Inc. v. Bigfoot Interactive, Inc.*, Civil Action C05 00636 (CW) (N.D. Cal.). Served as an expert witness for defendant in an action alleging infringement of U.S. Patent 6,449,634, relating to determining which file formats can be processed by an email client. Result: defendant obtained summary judgment of non-infringement, upheld by the Federal Circuit. Contact: Arthur Dresner, Esq., Duane Morris LLP, 1540 Broadway, New York, NY 10036. (D,R)

38. *Prism Technologies LLC v. Verisign, Inc. et al.*, CA 05-214-JJF (D. Del.). Served as an expert for plaintiff in an action alleging infringement of U.S. Patent 6,516,416, relating to use of a hardware key for authentication over networks. Defendants prevailed on summary judgment of non-infringement, which was upheld on appeal. Firm: Robins Kaplan Miller & Ciresi LLP. Contact: Dirk D. Thomas. Esq., McKool Smith, 1999 K Street, N.W., Suite 600, Washington, DC 20006. (R)

39. *AdvanceMe, Inc. v. RapidPay LLC et al.*, Civil Action 6:05-cv-424 LED (E.D. Tex., Tyler Division). Served as an expert witness for plaintiff in an action alleging infringement of U.S. Patent 6,941,281, relating to an automated payment system for dividing credit card proceeds between a merchant and another party. Testified at a bench trial in July 2007 before Judge Davis, who held the patent infringed but invalid for obviousness. Firm: Paul, Hastings LLP, Five Palo Alto Sq., Palo Alto, CA 94306. Contact: Ronald S. Lemieux, Esq., Singularity LLP, 275 Shoreline Drive, Redwood Shores, CA 94065. (D,R,T)

40. *IBM Corp. v. Amazon.com, Inc.*, CA 9:06-CV-242-RHC (E.D. Tex., Lufkin Div.) and *IBM Corp. v. Amazon.com, Inc.*, CA 6:06-CV-452-LED (E.D. Tex., Marshall Div.). Served as an expert for IBM in related actions alleging infringement of U.S. Patents 5,319,542, 5,442,771, 5,446,891, 5,796,967 and 7,072,849, all concerning methods of conducting electronic transactions, and a counterclaim for infringement of U.S. Patent 5,826,258, concerning a method for querying semistructured data. Case settled early in discovery when the parties cross-licensed each other's patents. Contact: Mark J. Ziegelbein, Esq., Dentons US LLP, 2000 McKinney Ave., Suite 1900, Dallas, TX 75201-1858.

41. *The MathWorks, Inc. v. COMSOL AB et al.*, CA 6:06-CV-334 (E.D. Tex., Tyler Division). Served as an expert for plaintiff The MathWorks, providers of the mathematical software system MATLAB, in an action alleging copyright infringement and infringement of U.S. Patents 7,051,338 and 7,181,745 concerning methods for invoking object methods from external environments. After trial, the case settled with defendant admitting infringement, paying $12,000,000 in damages and waiving appeal rights. Contact: Krista Schwartz, Esq., Jones Day, 77 W. Wacker Dr., Chicago, IL 60601-1692.

42. *Avante Int'l. Technology Corp. v. Diebold Election Systems et al.*, Case 4:06-CV-0978 TCM (E.D. Mo., Eastern Division). Served as an expert for defendants Sequoia Voting Systems and Premier Election Systems in an action alleging infringement of U.S. Patents 6,892,944, 7,036,730 and 7,077,313 concerning electronic voting technology. Dr. Shamos testified at a 5-day trial in February 2009. Result: The jury found Plaintiff's asserted claims invalid as anticipated and obvious. Contact: Peter T. Ewald, Esq., Oliff & Berridge, PLC, 277 South Washington Street, Suite 500, Alexandria, VA 22314. (D,R,T)

43. *Netcraft Corp. v. eBay, Inc. and PayPal, Inc.*, Case 3:07-cv:00254-bbc (W.D. Wisc. 2007). Served as an expert for defendants in an action alleging infringement of U.S. Patents 6,351,739 and 6,976,008 concerning methods of billing for ecommerce transactions over the Internet. Defendants were granted summary judgment of non-infringement on Dec, 10, 2007, upheld on appeal. Firm: Irell & Manella LLP, 180 Avenue of the Stars, Los Angeles, CA

90067. Contact: Kenneth Weatherwax, Esq., Goldberg, Lowenstein & Weatherwax LLP, 1925 Century Park East, Suite 2120, Los Angeles, CA 90067.

44. *ACLU of Ohio et al. v. Brunner et al.*, Case 1:09 CV 0145 (N.D. Ohio 2008). Served as an expert witness in an action alleging that the use of central count optical scan voting should not be permitted in Cuyahoga County, as had been ordered by the county board of elections. A preliminary injunction was denied in February 2008. The case became moot and was dismissed in May 2008 when the Ohio Legislature granted by statute the relief requested by plaintiff, prohibiting the use of central count opscan in Cuyahoga County. Contact: Meredith Bell-Platts, Esq., ACLU Voting Rights Project, 2600 Marquis One Tower, Atlanta, GA 30303. (R)

45. *Ariba, Inc. v. Emptoris, Inc.*, Civil Action 9:07-CV-90-RHC (E.D. Tex. 2007). Served as an expert for Ariba in an action alleging infringement of U.S. Patents 6,216,114 and 6,499,018, relating to the conduct of electronic auctions. Dr. Shamos testified in a jury trial on infringement and validity. Result: verdict finding all asserted claims valid and willfully infringed. Contact: Robert Fram, Esq., Covington & Burling LLP, One Front St., San Francisco, CA 94111. (D,R,T)

46. *EpicRealm Licensing, LP v. Autoflex Leasing Inc. et al.*, CA 5:07-CV-125 (E.D. Tex. 2005). Served as an expert for defendant Herbalife International of America, Inc. in an action alleging infringement of U.S. patents 5,894,554 and 6,415,335, relating to a system for managing generation of dynamic Internet web pages. All original defendants settled. See also the Oracle case below. Contact: Ognian Shentov, Esq., Jones Day, 222 E. 41st St., New York, NY 10017. Also served as an expert for defendant FriendFinder in a separate trial in this action. After a jury trial before Judge Folsom, the patents were found valid and infringed, but the jury awarded only $1.1M, the smallest amount testified to by defendant's damages expert. Contact: Michael J. Sacksteder, Esq., Fenwick & West LLP, 555 California St., San Francisco, CA 94104. (D,R,T)

47. *Oracle Corporation v. EpicRealm Licensing, LP*, CA 2-06-414 (D. Del. 2006), later *Oracle Corporation v. Parallel Networks, LLC.* Served as an expert for Oracle in a declaratory judgment alleging invalidity of U.S. patents 5,894,554 and 6,415,335, relating to a system for managing generation of dynamic Internet web pages. The patents are the same as those in the EpicRealm case, above. Oracle obtained summary judgment of non-infringement, reversed on appeal to the Federal Circuit. Case settled in May 2011 on the eve of trial. Firm: Kilpatrick Townsend & Stockton, LLP, 379 Lytton Ave., Palo Alto. CA 94301. Contact: Theodore T. Herhold, Singularity LLP, 275 Shoreline Drive, Redwood Shores, CA 94065. (D,R)

48. *Saulic v. Symantec Corporation et al.*, Case No. SA CV 07-610 AHS (C.D. Cal., Santa Ana Division, 2007). Served as an expert for defendant Symantec in a removal action alleging violation of California Civil Code §1747.8, relating to the collection of personal identification information in connection with credit card transactions. Case settled. Original firm: Heller Ehrman. Contact: Chad R. Fuller, Esq., Troutman Sanders LLP, 11682 El Camino Real, Suite 400, San Diego, CA 92121. (R)

49. *Gusciora et al. v. McGreevey et al.* (now *Gusciora v. Christie*), Docket No. MER-L-2691-04 (N.J. Super., Mercer County). Served as an expert for defendants, including the Governor and Attorney General of New Jersey, in a case alleging that the state's AVC Advantage voting machines are unconstitutionally insecure. A bench trial was held from January-May, 2009 before Judge Linda Feinberg. The Court's opinion adopts Dr. Shamos' testimony and comments on it extensively. Affirmed on appeal in October 2013. Contact: Leslie Gore, Esq., Asst. Atty. Gen'l., 25 Market Street, P.O. Box 112, Trenton, NJ 08625. (D,R,T)

50. *R.R. Donnelley & Sons Company v. Quark, Inc. et al.*, C.A. No. 06-00032-JJF (D. Del.). Served as an expert for plaintiff R.R. Donnelley in a case alleging infringement of U.S. Patents 6,205,452, 6,327,599, 6,844,940 and 6,952,801, relating to book assembly, imposition of graphics and control of electronic presses. Case has settled. Contact: Stuart W. Yothers, Esq., Ropes & Gray LLP, 1251 Avenue of the Americas, New York, NY 10020.

51. *MOAEC, Inc. v. Pandora Media, Inc. et al.*, Case No. 07-cv-654-bbc (W.D. Wisc.). Served as an expert for plaintiff in a case alleging infringement of U.S. Patents 5,969,283, 6,232,539, 6,953,886 and 7,205,471, relating to systems for organizing and retrieving digital music. Two defendants obtained summary judgment of noninfringement; the remaining defendant settled. Contact: Joshua Krumholz, Esq., Holland & Knight, LLP, 10 St. James Avenue, 11th Floor, Boston, MA 02116. (D,R)

52. *Web.com, Inc. v. The Go Daddy Group, Inc.*, Case No. CV07-01552-PHX-MHM (D. Ariz.). Served as an expert for defendant in a case alleging infringement of U.S. Patents 6,654,804, 6,789,103, 6,842,769 and 6,868,444, relating to methods for managing configuration of web servers and provision of Internet services. Case has settled. Firm: Wilson Sonsini Goodrich & Rosati, 650 Page Mill Road, Palo Alto, CA 94304. Contact: Richard G. Frenkel, Esq., Latham & Watkins LLP, 140 Scott Drive, Menlo Park, CA 94025.

53. *Hummel et al. v. Dynacraft BSC, Inc. et al.*, Case No. CV 052214 (Cal. Super. Marin Cty.). Served as an expert for defendants in an action alleging breach of contract for web hosting services. Dr. Shamos provided four hours of trial testimony. Result: verdict for the defense. Contact: Joe B. Harrison, Esq., Gardere Wynne Sewell LLP, 1601 Elm St., Suite 3000, Dallas, TX 75201. (T)

54. *Tegg Corp. v. Beckstrom Electric Co. et al.*, Civil Action No. 2:08-CV-00435-NBF (W.D. Pa.). Served as an expert for defendants in a case alleging infringement of copyright in computer software for administering field maintenance of electrical equipment. Case has settled. Original firm: Reed Smith LLP. Contact: Richard D. Kelley, Esq., Bean Kinney & Korman, 2300 Wilson Blvd., Suite 700, Arlington, VA 22220.

55. *Cordance Corporation v. Amazon.com, Inc.*, Civil Action No. 06-491-MPT (D. Del.). Served as an expert for plaintiff in a case alleging infringement of U.S. Patents 5,862,325, 6,088,717 and 6,757,710, relating to an infrastructure for conducting online transactions. In August 2009 a jury found the '717 patent valid but not infringed and the '710 patent infringed but invalid. The finding of invalidity of the '710 patent was vacated by the Court on judgment as a matter of law. The Federal Circuit reversed and reinstated the jury's finding. Contact: Robert

M. Abrahamsen, Esq., Wolf, Greenfield & Sacks, P.C., 600 Atlantic Avenue, Boston, MA 02210. (D,R, T)

56. *Anthurium Solutions, Inc. v. MedQuist, Inc. et al.*, Case No. 2:07-vcv-484 (DF/CE) (E.D. Tex.). Served as an expert for plaintiff in a case alleging infringement of U.S. Patent 7,031,998, relating to a distributed workflow system. Case settled ten days after responsive expert reports were served. Contact: Joshua Krumholz, Esq., Holland & Knight, LLP, 10 St. James Avenue, 11th Floor, Boston, MA 02116. (R)

57. *Performance Pricing, Inc. v. Google, Inc. et al.*, Case No. 2:07-cv-432(LED) (E.D. Tex.). Served as an expert for defendant Yahoo! in a case alleging infringement of U.S. Patent 6,978,253, relating to determining prices for items sold online. Case has settled as to defendant Yahoo!. Contact: Michael A. Jacobs. Esq., Morrison & Foerster LLP, 425 Market Street, San Francisco, CA 94105. Also served as an expert for remaining defendants Google and AOL. In March 2010 the Court granted defendants' motion for summary judgment of noninfringement, affirmed by the Federal Circuit. Contact: David A. Perlson. Esq., Quinn Emanuel Urquhart & Sullivan, LLP, 50 California Street, San Francisco, CA 94111. (D,R)

58. *Nationwide Power Solutions, Inc. et al., v. Eaton Electrical Inc.*, Case No. CV-8:07-0883-JVS (C.D. Cal.). Served as an expert for defendant/counterclaimant Eaton in a case alleging antitrust violations by Eaton arising out of proprietary servicing software in its uninterruptible power supplies. Case has settled. Contact: James L. Day, Esq., Latham & Watkins LLP, 505 Montgomery Street, Suite 2000 San Francisco, CA 94111.

59. *CBS Interactive, Inc. v. Etilize, Inc.*, Case No. C -6-05378 (MHP) (N.D. Cal.). Served as an expert for plaintiff in a case alleging infringement of U.S. Patents 6,714,933 and 7,082,426, relating to web crawling technology to aggregate product information. Defendant consented to an injunction against further infringement and the case settled. Firm: Winston & Strawn, LLP, 101 California Street, San Francisco, CA 94111. Contact: Glenn E. Westreich, Esq., Hayes and Boone, LLP, 2033 Gateway Place, San Jose, CA 95110.

60. *Geographic Services, Inc. v. Anthony Collelo*, Case 2008-9961 (Fairfax Cty., Va.). Served as an expert for plaintiff in a case alleging misappropriation of trade secrets involving determining and proofing geographic names as applied to maps and satellite imagery. Case was dismissed by Judge Ney on technical legal grounds at the close of Plaintiff's case. The Virginia Supreme Court reversed and remanded the case for further proceedings. Case has settled. Contact: Mark W. Wasserman, Esq., Reed Smith LLP, 3110 Fairview Park Drive, Suite 1400, Falls Church, VA 22042. (D,R,T)

61. *ODS Technologies, LP v. Magna Entertainment Corp., et al.*, CV 07-03265 DDP (D. Del.). Served as an expert for defendants in a case alleging infringement of U.S. Patents 5,830,068, 6,004,211, 6,089,981, 6,554,709 and 7,229,354, relating to off-track wagering systems and methods for restricting wagering based on location. Dr. Shamos submitted a declaration in support of summary judgment. Case settled before expert reports were

due. Contact: Virginia DeMarchi, Esq., Fenwick & West, LLP, 801 California Street, Mountain View, CA 94041. (R)

62. *Gannett Satellite Information Network, Inc. v. Office Media Network, Inc.*, C.A. No. 08-96-GMS (D.Del.). Served as an expert for defendant in a case alleging infringement of U.S. Patents 6,288,688, 6,622,826, 6,981,576 and 7,270,219, relating to display of advertising information on screens in elevators. Case settled shortly after Dr. Shamos's deposition. Contact: Steven R. Trybus, Esq., Jenner & Block LLP, 353 N. Clark St., Chicago, IL 60654. (D,R)

63. *Avante Int'l. Technology Corp. v. Premier Election Solutions et al.*, Case 4:06-CV-091367-ERW (E.D. Mo., Eastern Division). Served as an expert for defendants Sequoia Voting Systems and Premier Election Systems in an action alleging infringement of U.S. Patents 7,422,150, and 7,431,209 concerning electronic voting technology. Case settled in December 2009. Contact: Peter T. Ewald, Esq., Oliff & Berridge, PLC, 277 South Washington Street, Suite 500, Alexandria, VA 22314. (R)

64. *Accenture Global Services GmbH et al. v. Guidewire Software, Inc.*, Civ. No. 07-826-SLR (D. Del.). Served as an expert for Accenture in a case alleging misappropriation of trade secrets and infringement of U.S. Patents 7,013,284 and 7,017,111, relating to automated insurance claim handling. The District Court found the asserted system claims invalid under 35 U.S.C. § 101, affirmed by the Federal Circuit at 2011-1486. Case settled in Oct. 2011. Original firm: Morrison & Foerster, LLP. Contact: L. Scott Oliver, Esq., K&L Gates LLP, 630 Hansen Way, Palo Alto, CA 94304. (D,R)

65. *Alexsam, Inc. v. Evolution Benefits, Inc. et al.*, Case No. 2:07cv288-TJW (E.D. Tex.). Served as an expert for plaintiff in a case alleging infringement of U.S. Patent 6,000,608, relating to multifunction epayment cards. Case settled four weeks after Dr. Shamos's deposition. Original firm: Wolf, Greenfield & Sacks, P.C. Contact: James Foster, Esq., Hayes Messina Gilman Hayes LLC, 200 State St., 6th Floor, Boson, MA 02109. (D,R)

66. *Motivation Innovations, LLC v. DSW Inc. et al.*, C.A. No. 08-334-SLR (D. Del.). Served as an expert for defendant DSW, Inc. in a case alleging infringement of U.S. Patent 5,612,527, relating to a system for redeeming discount offers at point of sale. Case has settled. Contact: Drew Blatt, Ph.D., Esq., Wood, Heron & Evans LLP, 2700 Carew Tower 441 Vine Street Cincinnati, Ohio 45202.

67. *Discovery Communications, Inc. v. Amazon.com, Inc.*, C.A. No. 09-178-ER (D. Del.). Served as an expert for plaintiff Discovery Communications in a case alleging infringement of plaintiff's U.S. Patents 5,986,690, 6,557,173, 7,298,851, 7,299,501, 7,336,788 and 7,401,286, relating to electronic book viewers and electronic book selection and delivery systems, and defendant-counterclaimant's U.S. Patents 6,029,141 and 7,337,133, relating to Internet-based customer referral systems. Case has settled. Contact: Brent P. Lorimer, Esq., Workman | Nydegger, 1000 Eagle Gate Tower, 60 East South Temple Salt Lake City, UT 84111.

68. *Amazon.com v. Discovery Communications, Inc.*, No. 2:09-cv-0681-RSL (W.D. Wash.). Served as an expert for defendant Discovery Communications in a case alleging

infringement of U.S. Patents 6,006,225 and 6,169,986, relating to refinement of online search queries, and U.S. Patents 6,266,649 and 6,317,722., relating to generation of online recommendations. Case has settled. Contact: Brent P. Lorimer, Esq., Workman | Nydegger, 1000 Eagle Gate Tower, 60 East South Temple Salt Lake City, UT 84111.

69. *IMX, Inc. v. E-Loan, Inc. and Banco Popular North America, Inc.*, No. 09-cv-20965 (S.D. Fla.). Served as an expert for defendants in a case alleging infringement of U.S. Patent 5,995,947, relating to an interactive loan processing and mortgage trading system. Case was stayed pending reexamination. On appeal after reexamination, all but four of the asserted claims were cancelled. In CBM2015-00012, all asserted claims were found unpatentable under §101. Case has settled. Contact: Samuel A. Lewis, Esq., Feldman Gale, PA, One Biscayne Tower, 30th Floor, 2 South Biscayne Blvd., Miami, FL 33131. (D,R)

70. *Soverain Software LLC v. CDW Corp. et al.*, C.A. No. 6:07-CV-511 (E.D. Tex.). Served as an expert for plaintiff in a case alleging infringement of U.S. Patents 5,715,314, 5,909,492, and 7,272,639, relating to methods of conducting electronic commerce. All defendants settled except Newegg, Inc. Dr. Shamos testified on validity at a jury trial in April 2010. Result: all claims valid; the '314 and '492 claims infringed, with a running royalty assessed against Newegg. After trial, the Court found the '639 patent infringed as a matter of law. In January 2013 the Federal Circuit found the asserted claims obvious as a matter of law, The Supreme Court declined review. Contact: Ognian Shentov, Esq., Jones Day, 222 E. 41st St., New York, NY 10017. (D,R,T)

71. *Netcraft Corp. v. AT&T Mobility LLC et al.*, C.A. No. 07-651-GMS (D. Del.). Served as an expert for defendants in a case alleging infringement of U.S. Patents 5,794,221, 6,351,738 and 6,411,940, relating to electronic commerce billing methods. Case settled two months after Dr. Shamos's deposition. Contact: H. Jonathan Redway, Esq., Dickinson Wright PLLC, 1875 Eye St., Washington, DC 20006. (D,R)

72. *ValueClick, Inc. v. Tacoda, Inc., AOL, LLC and Platform-A, Inc.*, Case No. 2:08-cv-04619 DSF (JCx) (C.D. Cal.). Served as an expert for defendants in a case alleging infringement of U.S. Patents 5,848,396 and 5,991,735, relating to software and methods for creating psychographic profiles of network users. Case settled in May 2010. Original firm: Orrick, Herrington & Sutliffe, LLP. Contact: Paul R. Gupta, Esq., DLA Piper, 1251 Avenue of the Americas, New York, NY 10020.

73. *SP Technologies, Inc. v. Garmin Limited et al.*, Civil Action No. 08-CV-3248 (N.D. Ill.). Served as an expert for defendant TomTom, Inc. in a case alleging infringement of U.S. Patent 6,784,873, relating to graphical keyboards on touchscreens. Defendants prevailed on summary judgment of invalidity. Contact: Brian Pandya, Esq., Wiley Rein LLP, 1776 K Street NW, Washington DC 20006. (D,R)

74. *ePlus, Inc. v. Lawson Software, Inc.*, Civil Action No. 3:09-cv-620 (E.D. Va.). Served as an expert for defendant in a case alleging infringement of U.S. Patents 6,023,683, 6,055,516 and 6,505,172, relating to electronic procurement systems. Dr. Shamos testified at a jury trial in Richmond in January 2011. Result: No infringement as to most accused configurations;

infringement as to others. Past damages were precluded by the Court. On appeal. the Federal Circuit found the system claims invalid as indefinite. Contact: Daniel McDonald, Esq., Merchant & Gould PC, 3200 IDS Center, 80 South Eighth Street, Minneapolis, MN, 55402. (D,R,T)

75. *Bed Bath & Beyond, Inc. v. Sears Brands*, LLC, Civil Action 08 CV 5839-SDW-MCA (D. N.J.). Served as an expert for plaintiff in a declaratory judgment action regarding alleged infringement of U.S. Patent 5,970,474, relating to retail gift registry systems. Case has settled. Contact: William Mentlik, Esq., Lerner David Littenberg, Krumholz & Mentlik LLP, 600 South Avenue West, Westfield, NJ 07090. (D,R)

76. *Transauction, LLC v. eBay, Inc.*, Case No. 3:09-cv-3705-SJ (N.D. Cal.). Served as an expert for defendant in a case alleging infringement of U.S. Patent 7,343,339, relating to guarantees in online auctions. Case settled after expert reports were submitted. Firm: Irell & Manella LLP, 1800 Avenue of the Stars, Suite 900, Los Angeles, CA 90067. Contact: Peter E. Gratzinger, Esq., Munger, Tolles & Olson LLP, 355 South Grand Avenue, Los Angeles, CA 90071. (R)

77. *SDG Corporation v. Patrizzi & Co. Auctioneers SA et al.*, ICDR Case No. 50 117 T 00313 09 (Int'l. Centre for Dispute Resolution). Served as an expert for claimant in an arbitration alleging breach of contract to produce software for operating online auctions. Dr. Shamos testified at arbitration in October 2010. Award for SDG on all claims and denial of all of Patrizzi's counterclaims. Contact: Bruce Fox, Esq., Obermayer Rebmann Maxwell & Hippel LLP, One Mellon Center, Suite 5240, Pittsburgh, PA 15219. (D,R,T)

78. *Walker Digital, LLC v. Capital One Services, LLC et al.*, Civil Action 1:10cv212 (JFA) (E.D. Va.). Served as an expert for defendants in a case alleging infringement of U.S. Patents 5,970,478 and 6,374,230, relating to customizing and pricing credit card accounts. Defendants prevailed on summary judgment of non-infringement supported by a declaration from Dr. Shamos. Affirmed by the Federal Circuit on July 28, 2011. Contact: Charles S. Barquist, Esq., Morrison & Foerster LLP, 555 West Fifth Street, Suite 3500, Los Angeles, CA 90013. (R)

79. *Voter Verified, Inc. v. Premier Election Solutions, Inc. et al.*, Case No. 6:09-cv-1968-19KRS (M.D. Fla.). Served as an expert for defendants, manufacturers of voting equipment, in a case alleging infringement of U.S. Patents 6,769,613 and RE40,449, relating to paper trail verification of ballots. The Court denied a Daubert motion to exclude testimony by Dr. Shamos. Summary judgment of non-infringement granted July 28, 2011, affirmed by the Federal Circuit on November 5, 2012. All claims of the '449 patent were found non-statutory by the Federal Circuit in 2018. Contact: Robert M. Evans, Jr., Esq., Stinson LLP, 7700 Forsyth Blvd. Suite 1100, St. Louis, MO 63105. (R)

80. *Elder et al. v. National Conference of Bar Examiners*, No. C 11-00199 SI (N.D. Cal.). Served as an expert for disabled plaintiffs in a case seeking an injunction to permit them to take the bar examination in electronic format. Preliminary injunction granted Feb. 16, 2011. Plaintiff took the bar exam, passed and was awarded $224,000 in attorney's fees. Contact: Daniel F.

Goldstein, Esq., Brown, Goldstein & Levy, LLP, 120 E. Baltimore St., Suite 1700, Baltimore, MD 21202. (R)

81. *Ameranth, Inc. v. Menusoft Systems Corp., et al.*, Civil Action 2-07-CV-271 TJW/CE (E.D. Tex.). Served as an expert for plaintiff in a case alleging infringement of U.S. Patents 6,384,850, 6,871,325 and 6,982,733, relating to synchronous updating of restaurant menus on wireless devices. After trial, the jury found the patents not infringed. Case settled while an appeal to the Federal Circuit was pending. Contact: John W. Osborne, Esq., Osborne Law LLC, 33 Habitat Lane, Cortlandt Manor, NY 10567. (D,R,T)

82. *BuyFigure.com, Inc. v. Autotrader.com et al.*, Case No. 06391 (Ct. of Common Pleas of Philadelphia County, PA, 2010). Served as an expert for defendants in a case alleging misappropriation of trade secrets concerning a method of selling automobiles over the Internet. Summary judgment was granted in Defendants' favor in August 2012. Contact: Howard D. Scher, Esq., Buchanan Ingersoll & Rooney, P.C., Two Liberty Place, 50 S. 16th Street, Philadelphia, PA 19102. (R)

83. *Soverain Software LLC v. J.C. Penney Corp., Inc. et al.*, C.A. No. 6:09-CV-274 (E.D. Tex.). Served as an expert for plaintiff on validity issues in a case alleging infringement of U.S. Patents 5,715,314, 5,909,492, and 7,272,639, relating to methods of conducting electronic commerce. The '639 patent was dropped before trial and all defendants settled except Avon Products and Victoria's Secret. After trial, the jury found all claims valid and infringed, and awarded damages of $9.2 million against Victoria's Secret and $8.7 million against Avon. Contact: Robert B. Wilson, Esq., Quinn Emanuel Urquhart & Sullivan, LLP, 51 Madison Avenue, 22nd Floor, New York, NY 10010. (D,R,T)

84. *AOL, LLC, et al. v. Yahoo! Inc. et al.*, No. 09 Civ. 3774 (WHP) (S.D.N.Y). Served as an expert for declaratory judgment plaintiff AOL in a case alleging infringement of U.S. Patents 6,078,866, 6,269,361, 6,546,386, 6,907,566, 7,043,483, 7,107,264, 7,373,599, and 7,702,541, relating to online advertising placement and targeted e-commerce. Case settled in Feb. 2011. Original firm: Orrick, Herrington & Sutliffe LLP. Contact: William B. Tabler II, Esq., Flextronics, 6201 America Center Drive, San Jose, CA 95002.

85. *Accenture Global Services GmbH et al. v. Guidewire Software, Inc.*, Civ. No. 09-848-SLR (D. Del.). Served as an expert for Accenture in a case alleging infringement of U.S. Patent 7,617,240, relating to automated insurance claim handling. Case settled in Oct. 2011. Original firm: Morrison & Foerster, LLP. Contact: L. Scott Oliver, Esq., K&L Gates LLP, 630 Hansen Way, Palo Alto, CA 94304. (D,R)

86. *Amdocs (Israel) Limited v. Openet Telecom, Inc. et al.*, Case 1:10-cv-00910-LMB-TRJ (D. Del.). Served as an expert for Defendant Openet in a case alleging infringement of U.S. Patents 6,836,797 and 7,631,065, relating to aggregated billing for network services. Summary judgment of non-infringement granted in favor of Defendants in Sept. 2012. The Court's opinion cites Dr. Shamos' testimony. Judgment reversed on appeal in 2014, but on remand, all claims were invalidated as claiming non-statutory subject matter. After a second appeal, the

§101 ruling was reversed. Case settled during trial in 2018. Contact: Kevin Anderson, Esq., Duane Morris LLP, 505 9th Street, N.W., Suite 1000, Washington, DC 20004-2166 (D,R)

87. *Cross-Atlantic Capital Partners, Inc. v. Facebook, Inc. et al.*, Case 07-CV-2768 JP (E.D. Pa.). Served as an expert for plaintiff in a case alleging infringement of U.S. Patent 6,519,629, relating to establishment of online communities. Asserted claims were cancelled upon reexamination. Case has been dismissed. Original firm: McShea/Tecce PC. Contact: Frederick Tecce, Esq., Panitch Schwarze Belisario & Nadel LLP, One Commerce Square, 2005 Market Street, Suite 2200, Philadelphia, PA 19103. (R)

88. *Chavez et al. v. Bennett et al.*, CV 2006-007000 (Ariz. Super., Maricopa Cty.). Served as an expert for defendant Secretary of State of Arizona and county defendants in a case alleging that the electronic voting systems used in Arizona violated the rights of voters. Case was voluntarily dismissed by plaintiffs in May 2011. Contact: Laurence G. Tinsley, Jr., Esq, Senior General Counsel, Maricopa County Office of General Litigation Services, 301 W. Jefferson St., Phoenix, AZ 85003.

89. *Bonnette v. District of Columbia Court of Appeals and National Conference of Bar Examiners*, No. 11-cv-01053-CKK (D. D.C.). Served as an expert for a disabled plaintiff in a case seeking a preliminary injunction permitting her to take the bar examination in electronic format. Injunction granted. Case subsequently settled with Plaintiff receiving $141,000 in attorneys' fees and costs. Contact: Daniel F. Goldstein, Esq., Brown, Goldstein & Levy, LLP, 120 E. Baltimore St., Suite 1700, Baltimore, MD 21202.

90. *Jones v. National Conference of Bar Examiners et al.*, No. 5:11-cv-00174-cr (D. Vermont). Served as an expert for a disabled plaintiff in a case seeking an injunction permitting to take the bar examination using assistive technology. The preliminary injunction was granted. Plaintiff was awarded $275,000 in attorneys' fees and costs. Contact: Daniel F. Goldstein, Esq., Brown, Goldstein & Levy, LLP, 120 E. Baltimore St., Suite 1700, Baltimore, MD 21202. (R)

91. *AlmondNet, Inc. v. Microsoft Corporation*, Case 10-CV-298 (W.D. Wisc.). Served as an expert for plaintiff and counterclaim defendant AlmondNet in a case alleging infringement of U.S. Patents 6,973,436, 7,072,853, 7,454,364 and 7,822,637 by Microsoft, relating to bidding for Internet ad placement, and infringement of U.S. Patent 6,632,248 by AlmondNet, relating to customization of network documents via a unique user identifier. Microsoft obtained summary judgment of non-infringement. Contact: Meredith Zinanni, Esq., Kirkland & Ellis LLP, 300 N. LaSalle, Chicago, IL 60604.

92. *Kelora Systems, LLC. v. Target Corporation et al.*, Case 10-CV-683 (W.D. Wisc.). Served as an expert for defendant Mason Companies, Inc. in a case alleging infringement of U.S. Patent 6,275,821, relating to guided parametric searching in online catalogs. Case settled as to this defendant in July 2011. The Court granted summary judgment of invalidity and non-infringement as to the other defendants, affirmed by the Federal Circuit. Contact: Shane A. Brunner, Esq., Merchant & Gould, 10 East Doty St., Suite 600, Madison, WI 53703.

93. *TNS Media Research, LLC et al. v. TRA Global, Inc.*, Case 1:2011-CV-4039 (SAS) (S.D. N.Y.). Served as an expert for declaratory judgment plaintiffs in case alleging infringement of U.S. Patent 7,729,940, relating to anonymous matching of program viewing data from television set-top boxes with purchase data from other sources. Patentee's motion for preliminary injunction was denied on Sept. 23, 2011. Plaintiffs' motion for summary judgment of non-infringement was granted on October 3, 2013. Reversed and remanded by the Federal Circuit. Contact: Michael Albert, Esq., Wolf, Greenfield & Sacks, P.C., 600 Atlantic Avenue, Boston, MA 02210. (R)

94. *Accenture Global Services GmbH et al. v. Guidewire Software, Inc.*, Case 3:11-03563-JSW (N.D. Cal.); *Guidewire Software, Inc. v. Accenture PLC et al.*, Case 4:11-cv-04686-LB (N.D. Cal.). Served as an expert for Accenture in related cases alleging infringement by Guidewire of U.S. Patents 6,574,636, 7,409,355 and 7,979,382, relating to systems for insurance claim handling and alleging infringement by Accenture of U.S. Patents 5,630,069, 5,734,837, 6,058,413 and 6,073,109, relating to workflow management systems. Cases settled in Oct. 2011. Contact: Colleen Garlington, Esq., Kirkland & Ellis LLP, 300 N. LaSalle St., Chicago, IL 60604.

95. *XPRT Ventures, LLC v. eBay, Inc. et al.*, C.A. 1:2010-cv-595 (SLR) (D. Del.). Served as an expert for Defendants eBay and PayPal in a case alleging infringement of U.S. Patents 7,483,856, 7,512,563, 7,567,937, 7,599,881, 7,610,244, 7,627,528, relating to methods of paying for items purchased through electronic auctions. Case has settled. Contact: Adrian Percer, Esq., Weil, Gotshal & Manges, LLP, 201 Redwood Shores Parkway, Redwood Shores, CA 94065. (D,R)

96. *Rich Media Club, LLC et al. v. Nikolai Mentchoukov et al.*, Civil No. 2:11-cv-01202-SA (D. Utah). Served as an expert for Plaintiffs in a case alleging breach of an employment contract, unfair competition concerning systems for placing advertisements on web pages and infringement of U.S. Patent 7,313,590, relating to communication between client and server computers without requiring a browser. Contact: Jared Richards, Esq., Bennett Tueller Johnson & Deere, LLC, 3165 East Millrock Drive, Suite 500, Salt Lake City, Utah 84121. (R)

97. *Franklin Inventions LLC v. Election Systems & Software, Inc.*, Case No: 2:09-cv-377 (E.D. Tex.). Served as an expert for Defendants in a case alleging infringement of U.S. Patents 6,968,999, 7,243,846 and 7,575,164, relating to voter-verifiable voting systems. Case settled after a declaration concerning invalidity was submitted by Dr. Shamos. Contact: Robert M. Evans, Jr., Esq., Lewis Rice LLC, 600 Washington Avenue, Suite 2500, St. Louis, MO 63101. (R)

98. *Illinois Computer Research, LLC v. HarperCollins Publishers, LLC, et al.*, Case No.: 10-cv-9124 (S.D.N.Y). Served as an expert for Defendants in a case alleging infringement of U.S. Patent 7,111,252, relating to limiting access to electronic books. Case settled after Markman. Contact: Brian S. Rosenbloom. Esq., Rothwell, Figg, Ernst & Manbeck, P.C., 607 14th Street, N.W., Suite 800, Washington, DC 20005. (R)

99. *Realtime Data, LLC d/b/a IXO v. Morgan Stanley et al.*, Case No.: 11 Civ. 6696 (RJH), *Realtime Data, LLC d/b/a IXO v. CME Group Inc. et al.*, Case No.: 11 Civ. 6701 (RJH), *Realtime Data, LLC d/b/a IXO v. Thompson Reuters, et al.*, Case No.: 1:2011-cv-06704 (RJH) (S.D.N.Y). Served as an expert for Plaintiff in three consolidated cases alleging infringement of U.S. Patents 7,417,568, 7,714,747, and 7,777,651, relating to compression and decompression of financial data streams. Summary judgment granted for defendants, upheld by the Federal Circuit. Contact: Dirk D. Thomas. Esq., McKool Smith, 1999 K Street, N.W., Suite 600, Washington, DC 20006. (D,R,T)

100. *Mulhern Belting, Inc. v. Tele-Data Solutions, Inc.*, Civil Action L-2258-10 (Sup. Ct. Bergen Cty. NJ). Served as an expert for defendant Vertical Communications, Inc. in a case alleging breach of contract and fraud in connection with the installation of an integrated voice-over-IP (VoIP) telecommunications system. Case has settled. Contact: John J. Abromitis, Esq., Courter, Kobert & Cohen P.C., 1001 Route 517, Hackettstown, NJ 07840. (R)

101. *Decision Support, LLC v. Election Systems & Software, Inc.*, Case No: 3:10cv90 (W.D. N.C.). Served as an expert for Defendants in a case alleging infringement of U.S. Patent 7,497,377, relating to electronic voter registration and pollbook systems. Case has settled. Contact: Robert M. Evans, Jr., Esq., Lewis Rice LLC, 600 Washington Avenue, Suite 2500, St. Louis, MO 63101. (R)

102. *Rovi Corporation et al. v. Amazon.com, Inc. et al.*, Case No. 11-cv-00003-RGA (D. Del.). Served as an expert for Plaintiffs in a case alleging infringement of U.S. Patents 5,988,078, 6,275,268, 6,769,128, 7,493,643 and 7,603,690, relating to customized on-screen television guides. The parties stipulated to entry of judgment of noninfringement. Contact: Ragesh L. Tangri, Esq., Durie Tangri LLP, 217 Leidesdorff Street, San Francisco, CA 94111.

103. *Certain Products Containing Interactive Program Guide and Parental Control Technology*, USITC Inv. No. 337-TA-820. Served as an expert for Complainants Rovi Corporation et al. and against Vizio, Inc. et al. in an International Trade Commission proceeding involving alleged infringement of U.S. Patents 6,701,523, 7,047,547, 7,493,643 and RE41,993, relating to v-chips and electronic TV program guides. Case has settled. Contact: Hong S. Lin, Esq., Paul Hastings LLP, 1117 S. California Avenue, Palo Alto, CA 94304. (R)

104. *Rovi Corporation et al. v. Roku, Inc.*, Case No. 12-cv-2185 EJD (N.D. Cal.). Served as an expert for Plaintiffs in a case alleging infringement of U.S. Patent 6,898,762, relating to a client/server electronic television program guide. Voluntarily dismissed by plaintiff without prejudice. Contact: Hong S. Lin, Esq., Paul Hastings LLP, 1117 S. California Avenue, Palo Alto, CA 94304.

105. *Rovi Corporation et al. v. LG Electronics, Inc. et al.*, Case No. 12-cv-00545-SLR (D. Del.). Served as an expert for Plaintiffs in a case alleging infringement of U.S. Patents 6,898,762, 7,065,709, 7,225,455, 7,493,643 and 8,112,776, relating to electronic television program guides. Case has settled. Contact: Hong S. Lin, Esq., Paul Hastings LLP, 1117 S. California Avenue, Palo Alto, CA 94304.

106. *Rovi Corporation et al. v. Vizio, Inc.*, Case No. 12-cv-00546-SLR (D. Del.). Served as an expert for Plaintiffs in a case alleging infringement of U.S. Patents 6,898,762, 7,065,709, 7,103,906 and 8,112,776, relating to electronic television program guides. Case has settled. Contact: Hong S. Lin, Esq., Paul Hastings LLP, 1117 S. California Avenue, Palo Alto, CA 94304.

107. *Rovi Corporation et al. v. Mitsubishi Electric Corp. et al.*, Case No. 12-cv-00547-SLR (D. Del.). Served as an expert for Plaintiffs in a case alleging infringement of U.S. Patents 6,701,523, 7,225,455 and 7,493,643, relating to electronic television program guides. Case has settled. Contact: Hong S. Lin, Esq., Paul Hastings LLP, 1117 S. California Avenue, Palo Alto, CA 94304.

108. *Netflix, Inc. v. Rovi Corporation et al.*, Case No. 11-cv-06591-PJH (N.D. Cal.). Served as an expert for Defendants in a declaratory judgment case seeking a declaration of non-infringement of U.S. Patents 6,305,016, 6,898,762, 7,100,185, 7,103,906 and 7,945,929, relating to electronic television program guides. Summary judgment was granted declaring all asserted claims invalid under 35 U.S.C. §101, affirmed by the Federal Circuit. Contact: Hong S. Lin, Esq., Paul Hastings LLP, 1117 S. California Avenue, Palo Alto, CA 94304. (R)

109. *Certain Products Containing Interactive Program Guide and Parental Control Technology*, USITC Inv. No. 337-TA-845. Served as an expert for Complainants Rovi Corporation et al. and against Netflix, Inc. et al. in an International Trade Commission proceeding involving alleged infringement of U.S. Patents 6,701,523, 6,898,762, 7,065,709, 7,103,906, 7,225,455, 7,493,643 and 8,112,776, relating to v-chips and electronic TV program guides. On Initial Determination, all claims Dr. Shamos testified about were found valid. The import requirement was found not satisfied and no infringement was found. Contact: Hong S. Lin, Esq., Paul Hastings LLP, 1117 S. California Avenue, Palo Alto, CA 94304. (D,R,T)

110. *Yardi Systems, Inc. v. Realpage, Inc. et al.*, Case No. 2:11-cv-0090-ODW-JEM (C.D. Cal.). Served as an expert for Defendants in an action alleging misappropriation of trade secrets, unfair competition, violation of the Computer Fraud and Abuse Act, the Comprehensive Computer Data Access and Fraud Act (Cal. Penal Code §502) and the Digital Millennium Copyright Act, arising out of provision of cloud-based property management systems. Case has settled. Contact: Susan van Keulen, Esq., O'Melveny & Myers LLP, 2765 Sand Hill Road, Menlo Park, CA 94025.

111. *Long Range Systems, LLC v. HME Wireless, Inc.*, Civil Action 3:12-cv-03659-P (N.D. Tex.). Served as an expert for plaintiff in a case alleging infringement of U.S. Patent 6,712,278, relating to a wireless system for locating a customer's table in a restaurant. Case was dismissed by plaintiff. Contact: David Cabello, Esq., Wong, Cabello, Lutsch, Rutherford & Brucculeri, LLP, 20333 SH 249, Suite 600, Houston, Texas 77070. (R)

112. *EdiSync Systems, LLC v. Centra Software, Inc. et al.*, Civil Action 03-cv-01587-WYD-MEH (D. Colo.). Served as an expert for Defendant Saba Software Inc. in a case alleging infringement of U.S. Patent 5,799,320, relating to multi-author document editing systems. Case has

settled. Contact: Robert M. Abrahamsen, Esq., Wolf, Greenfield & Sacks, P.C., 600 Atlantic Avenue, Boston, MA 02210. (D,R)

113. *TecSec, Inc. v. IBM et al.*, Case No. 1:10-cv-115-LMB/TCB (E.D. Va.). Served as an expert for Defendant SAS Institute, Inc. in a case alleging infringement of U.S. Patents 5,369,702, 5,680,452, 5,717,755 and 5,898,781, relating to the Distributed Cryptographic Object Method, allowing embedding of encrypted objects within other objects. The Court entered judgment of non-infringement after Markman. Affirmed by the Federal Circuit at 2011-1303. Contact: Thomas R. Goots, Esq., Jones Day, North Point, 901 Lakeside Avenue, Cleveland, Ohio 44114-1190.

114. *Integrated Technological Systems, Inc. v. Green Dot Corporation*, Civ. Action No. 2:11-cv-01626-GMN-(GWF) (D. Nev.). Served as an expert for Defendant in a case alleging infringement of U.S. Patent 7,912,786, relating to an electronic payment system for transferring money between debit card accounts. Case has settled. Contact: Benjamin J. Sodey, Esq., Bryan Cave LLP, One Metropolitan Square (211 North Broadway), Suite 3600, St. Louis, MO 63102-2750.

115. *Hausen et al. v. PS Illinois Trust*, Case No. 11-cv-06888 (N.D. Ill.). Served as an expert for Plaintiff in a case concerning the reasonableness of credit card and email notification practices employed by a public storage facility prior to selling customers' stored goods. Case has settled. Contact: Jeffrey S. Becker, Esq., Swanson, Martin & Bell, LLP, 330 N. Wabash, Suite 3300, Chicago, IL 60611. (D,R)

116. *Linksmart Wireless Technology, LLC v. T-Mobile, USA, Inc. et al.*, Case 2:08-cv-264-DF-CE (E.D. Texas). Served as an expert for Defendant Choice Hotels International, Inc. in a case alleging infringement of U.S. Patent 6,779,118, relating to rule-based redirection of Internet service requests based on a user ID. Case has settled. Contact: Gregory R. Lyons, Esq., Wiley Rein LLP, 1776 K Street NW, Washington DC 20006.

117. *SAP America, Inc. v. Purple Leaf, LLC et al.*, Case No. 4:11-cv-04601-PJH (N.D. Cal.). Served as an expert for declaratory judgment plaintiff SAP in a case alleging infringement of U.S. Patents 7,603,311 and 8,027,913, relating to methods for conducting payment transactions over the Internet. Case has settled. Original firm: Simpson Thatcher & Bartlett LLP. Contact: Brian McCloskey, Esq., Greenberg Traurig, LLP, MetLife Building, 200 Park Ave., New York, NY 10166.

118. *Ameranth, Inc. v. PAR Technology Corp., et al.*, Civil Action 2-10-CV-294 JRG-RSP (E.D. Tex.). Served as an expert for plaintiff in a case alleging infringement of U.S. Patents 6,384,850 and 6,871,325, relating to synchronous updating of hospitality applications and data on wireless devices. Case settled after expert reports were served. Contact: John W. Osborne, Esq., Osborne Law LLC, 33 Habitat Lane, Cortlandt Manor, NY 10567. (R)

119. *Digital-Vending Services International, LLC, v. The University of Phoenix, Inc. et al.*, Civil Action 2:09-cv-555-AWA-TEM (E.D. Va.). Served as an expert for plaintiff in a case alleging infringement of U.S. Patents 6,170,014, 6,282,573 and 6,606,664, relating to content delivery

methods particularly applicable to online courseware. Summary judgment of non-infringement granted October 4, 2013. Contact: Andrew G. DiNovo, Esq., DiNovo Price Ellwanger & Hardy LLP, 7000 N. MoPac Expressway, Suite 350, Austin, TX 78731. (D,R)

120. *Analytical Mechanics Associates, Inc. v. Rhythm Engineering, LLC et al.*, Case No. 4:12-cv-00008 (E.D. Va.). Served as an expert for defendants in a case alleging breach of a contract relating to development of an image processing system to detect vehicles at intersections and control traffic signals. Case was resolved by binding arbitration. Contact: John K. Power, Esq., Husch Blackwell LLP, 4801 Main Street, Suite 1000, Kansas City, MO 64112. (D,R,T)

121. *Protegrity Corporation v. Voltage Security, Inc.*, Case No. 3:10-CV-755 (RNC) (D. Conn.). Served as an expert for defendant in a case alleging infringement of U.S. Patents 6,321,201, 6,963,980 and 7,325,129, relating to methods of encrypting databases. Case settled during trial. Contact: Edward G. Poplawski, Esq., Wilson Sonsini Goodrich & Rosati Professional Corporation, 650 Page Mill Road, Palo Alto, CA 94304-1050. (D,R,T)

122. *Progressive Casualty Insurance Company v. Allstate Insurance Company et al.*, Case No. 1:11-cv-00082-BYP (N.D.Ohio). Served as an expert for defendant Allstate in a case alleging infringement of U.S. Patent 6,064,970, relating to determining the cost of automobile insurance by monitoring the location and activity of a vehicle, and U.S. Patent 7,124,088, relating to online modification and quoting of insurance policies. Case has settled as to Allstate. Contact: James Medek, Esq., Kirkland & Ellis LLP, 300 North LaSalle Chicago, IL 60654.

123. *Symantec Corporation v. Acronis, Inc. et al.*, Case No. 3:11-cv-05310 EMC (N.D. Cal.). Served as an expert for plaintiff and infringement counterclaim defendant Symantec in a case alleging infringement of U.S. Patents 6,615,365, 7,047,380, 7,246,211 and 7,266,655, relating to online disk backup, imaging and recovery systems, U.S. Patent 7,093,086, relating to backup of virtual machines, U.S. Patent 7,322,010, relating to graphic views of computer configurations and U.S. Patent 7,565,517, relating to retargeting hardware configuration images to new hardware. Case has settled. Contact: Jennifer Kash, Esq., Quinn Emanuel Urquhart & Sullivan LLP, 50 California Street, 22nd Floor, San Francisco, California 94111. (D,R)

124. *Secure Axcess, LLC v. Bank of America Corp. et al.*, Civil Action No. 6:10-cv-670-LED (E.D. Tex.). Served as an expert for defendants Zions First National Bank and Amegy Bank N.A. in a case alleging infringement of U.S. Patent 7,631,191, relating to authenticating web pages. Case has settled as to those defendants. Contact: Brian Pandya, Esq., Wiley Rein LLP, 1776 K Street NW, Washington DC 20006.

125. *The MoneySuite Company v. Insurance Answer Center, LLC et al.*, Case No. SACV 11-1847-AG (C.D. Cal.). Served as an expert for defendants, including The Allstate Corporation, in a case alleging infringement of U.S. Patent 6,684,189, relating to online quoting of insurance policy rates. Case has settled. Contact: Garret A. Leach, Esq., Kirkland & Ellis LLP, 300 N. LaSalle, Chicago. IL 60654. (D,R)

126. *e-LYNXX Corporation v. Innerworkings, Inc. et al.*, CA 1:10-cv-02535-CCC (M.D. Pa.). Served as an expert for defendants, including R.R. Donnelley & Sons Company, in a case

alleging infringement of U.S. Patents 7,451,106 and 7,788,143, relating to electronic procurement of customized goods and services. The Court granted summary judgment of non-infringement in July 2013. Contact: James R. Nuttall, Esq., Steptoe & Johnson, LLP, 115 South LaSalle Street, Suite 3100, Chicago, IL 60603. (R)

127. *Vasudevan Software, Inc. v. Microstrategy, Inc.*, Case No. 3:11-cv-06637-RS-PSG (N.D. Cal.). Served as an expert for defendant in a case alleging infringement of U.S. Patents 6,877,006, 7,167,864, 7,720,861 and 8,082,268, relating to methods of online analytical processing (OLAP). The patents were found invalid on summary judgment. On appeal, the Federal Circuit upheld the Court's claim constructions and judgment of non-infringement. Declaratory judgment counterclaims voluntarily dismissed. Contact: Kevin A. Smith, Esq., Quinn Emanuel Urquhart & Sullivan, LLP, 50 California Street, San Francisco, CA 94111. (R)

128. *Digonex Technologies, Inc. v. Qcue, Inc.*, Case No. 1:12-cv-00801-SS (W.D. Texas). Served as an expert for plaintiff in a case alleging infringement of U.S Patents 8,095,424 and 8,112,303, relating to computerized methods for dynamic pricing. In a Markman order, the Court found the claims indefinite. Contact: David D. Schumann, Fenwick & West LLP, 555 California Street, 12th Floor, San Francisco, CA 94104. (D,R,T)

129. *Peter Mayer Publishers, Inc. v. Daria Shilovskaya et al.*, Case No. 12-CV-8867-PG (S.D. N.Y.). Served as an expert for declaratory judgment defendants in a case of first impression to determine whether a reliance party under 17 U.S.C. §104A(d)(3)(B) may issue an ebook version of a work to which copyright has been restored. The Court ruled that ebooks are not transformative and hence not derivative works. Contact: Timothy O'Donnell, Esq., 40 Exchange Place, 19th Fl., New York, NY 10005. (R)

130. *SIPCO, LLC v. Control4 Corporation et al.*, CA 1:11-cv-00612-JEC (N.D. Georgia). Served as an expert for defendants Schneider Electric Buildings Americas, Inc. and Schneider Electric USA, Inc. in a case alleging infringement of U.S. Patents 7,103,511, 7,468,661 and 7,697,492, relating to systems for monitoring remote sensors and controlling remote devices. Case has settled. Contact: Benjamin Bradford, Esq., Jenner & Block LLP, 353 N. Clark St., Chicago, IL 60654-3456.

131. *Unified Messaging Solutions LLC v. Google, Inc. et al.*, Case 1:12-cv-06286 (N.D. Ill.). Served as an expert for defendant eBay, Inc. in a case alleging infringement of U.S. Patents 6,857,074, 7,836,141, 7,895,306, 7,895,313, and 7,934,148, relating to message storage and delivery systems. Case has settled as to defendant eBay, Inc. Contact: Yar R. Chaikovsky, Esq., McDermott Will & Emery LLP, 275 Middlefield Road, Suite 100, Menlo Park, CA 94025.

132. *Credit Card Fraud Control Corporation v. PayPal, Inc.*, Case No. 9:12-CV-81143 (S.D. Fla.). Served as an expert for defendant PayPal in a case alleging infringement of U.S. Patent 8,229,844, relating to reduction of fraud in online transactions. Plaintiff dismissed the case with prejudice based on prior art located by PayPal. Contact: Adrian Percer, Esq., Weil, Gotshal & Manges, LLP, 201 Redwood Shores Parkway, Redwood Shores, CA 94065.

133. *Comscore, Inc. v. Integral Ad Science, Inc.*, Civil Action 2:12-cv-00351-HCM-DEM (E.D. Va.). Served as an expert for defendant Integral in a case alleging infringement of U.S. Patents 6,108,637, 6,115,680, 6,327,619, 6,418,470, 7,386,473, 7,613,635, 7,716,326 and 7,756,974, relating to determining whether a portion of a displayed page is visible to a user. Case has settled as to defendant Integral. Contact: Robert M. Abrahamsen, Esq., Wolf, Greenfield & Sacks, P.C., 600 Atlantic Avenue, Boston, MA 02210.

134. *Ariba, Inc. v. Coupa Software, Inc.*, Case No. 3:12-cv-01484 JST (N.D. Cal.). Served as an expert for plaintiff Ariba in a case alleging infringement of U.S. Patent 7,117,165, relating to electronic methods for approving requisitions and generating purchase orders. Case has settled. Contact: Amy Van Zant, Esq., Covington & Burling LLP, 333 Twin Dolphin Drive, Redwood Shores, CA 94605-1418. (D,R)

135. *Lowe v. National Board for Respiratory Care, Inc. et al.*, Docket 1:12-cv-00345-DBH (D. Maine). Served as an expert for disabled plaintiff in a case seeking an injunction permitting to take a professional qualification examination using assistive computer technology. Case settled shortly after Dr. Shamos's declaration in support of preliminary injunction was filed. Contact: Kristin Aiello, Esq., Managing Attorney, Disability Rights Center, 24 Stone St., Augusta, ME 04338. (R)

136. *Checkfree Corporation et al. v. Metavante Corporation et al.*, Case No. 3:12-cv-15-J-34JBT (M.D. Fla.) Served as an expert for defendant Metavante in a case alleging infringement of U.S. Patents 7,383,223, 7,792,749, 7,853,524 and 7,996,311, relating to transferring funds in electronic payment networks. Defendants have counterclaimed, alleging infringement of U.S. Patents. 7,370,014, 7,734,543 and 7,958,049, relating to electronic invoice presentment. All claims of all four patents asserted by Plaintiff have been found invalid by the Patent Office. Case was stayed pending appeal, followed by voluntary dismissal by Plaintiff. Contact: Jeffrey A. Berkowitz, Esq., Finnegan, Henderson, Farabow, Garrett & Dunner, L.L.P., Two Freedom Square, 11955 Freedom Drive, Reston, VA 20190-5675. (D,R)

137. *PPS Data, LLC v. Passport Health Communications, Inc.*, Case No. 2:12-cv-00438-DN (C.D. Utah). Served as an expert for defendant Passport in a case alleging infringement of U.S. Patents 6,341,265 and 7,194,416, relating to preparing and correcting health insurance claim forms. Case settled shortly after Dr. Shamos's claim construction report was served. Contact: Edward J. Pardon, Esq., Merchant & Gould, 10 East Doty Street, Suite 600, Madison, WI 53703. (R)

138. *Lodsys, LLC v. Combay, Inc. et al.*, Civil Action 2:11-cv-272 (E.D. Texas). Served as an expert for defendant Symantec Corporation in a case alleging infringement of U.S. Patents 7,222,078 and 7,620,565, relating to gathering feedback from products through a user interface. Case settled two weeks after Dr. Shamos's deposition. Contact: David D. Schumann, Fenwick & West LLP, 555 California Street, 12th Floor, San Francisco, CA 94104. (D,R)

139. *Long Range Systems, LLC v. HME Wireless, Inc.*, Civil Action 3:12-cv-04162M (N.D. Tex.). Served as an expert for plaintiff in a case alleging infringement of U.S. Patents 6,542,751 and 7,062,281, relating to methods of paging customers at a restaurant. Case was dismissed by

plaintiff after a tentative Markman ruling. Contact: David Cabello, Esq., Wong, Cabello, Lutsch, Rutherford & Brucculeri, LLP, 20333 SH 249, Suite 600, Houston, Texas 77070. (R)

140. *Symantec Corporation v. Veeam Software Corporation*, Case No. 3:12-cv-0700-SI (N.D. Cal.). Served as an expert for plaintiff Symantec in a case alleging infringement of U.S. Patents 6,931,558, relating to methods for restoring network devices after failure, 7,024,527, relating to methods of backing up disk while applications are active, 7,093,086, relating to methods for backing up virtual machines, 7,254,682, relating to snapshot disk backup, 7,480,822, relating to restoring running states of computing systems, 7,831,861, relating to restoring application data and 8,117,168, relating to virtual disk backups. Case is stayed pending PTAB review. All asserted claims have been found unpatentable. On appeal to the Federal Circuit, the PTAB's claim construction and obviousness determinations were upheld, case remanded to allow amendment of claims. Case subsequently settled. Contact: Jennifer Kash, Esq., Quinn Emanuel Urquhart & Sullivan LLP, 50 California Street, 22nd Floor, San Francisco, California 94111. (R)

141. *EMG Technology, LLC v. Green Mountain Coffee Roasters and Keurig, Inc.*, Case No. 6:13-cv-144 (E.D. Texas) (Lead case: 6:13-cv-134). Served as an expert for Defendants in a case alleging infringement of U.S. Patent 7,441,196, relating to a method of navigating a Web page linked to a sister web site. Case has settled. Contact: Michael A. Albert, Esq., Wolf, Greenfield & Sacks, P.C., 600 Atlantic Avenue, Boston, MA 02210.

142. *eDirect Publishing, Inc. v. Live Career, Ltd., et al.*, Case No. 12-CV-1123-JAH-JMA (S.D. Cal.). Served as an expert for plaintiff eDirect in a case alleging infringement of U.S. Patents 6.363,376 and 6,757,674, relating to automatic submission of information to career websites. Case has settled. Contact: Ryan Baker, Esq., Baker Marquart LLP, 10990 Wilshire Blvd., Los Angeles, CA 90024. (D,R)

143. *Motivation Innovations, LLC v. Ulta Salon Cosmetics and Fragrance, Inc. et al.*, C.A. No. 11-615-SLR-MPT (D. Del.). Served as an expert for defendant Ulta in a case alleging infringement of U.S. Patent 5,612,527, relating to a system for redeeming discount offers at point of sale. The Court granted summary judgment of noninfringement. Contact: Julie Heaney, Esq., Morris, Nichols, Arsht & Tunnell, LLP, 1201 North Market Street, Wilmington, DE 19899-1347. (D,R)

144. *Computer Software Protection, LLC v. Autodesk, Inc.*, C.A. No. 12-452-SLR (D. Del.). Served as an expert for Defendant Autodesk in a case alleging infringement of U.S. Patent 6,460,140, relating to unlocking the use of software remotely using validation number, a registration key and a license key. Case has settled. Contact: Cheryl T. Burgess, Esq., Knobbe, Martens, Olson & Bear, L.L.P., 2040 Main Street, 14th Floor Irvine, CA 92614. (R)

145. *Voltage Security, Inc.* v. *Protegrity Corporation*, CBM2014-0024, Patent Trial and Appeal Board. Served as an expert for petitioner in a covered business method petition seeking review of U.S. Patent 8,402,281, relating to methods of encrypting databases. Matter has settled. Contact: Matthew Argenti, Esq., Wilson Sonsini Goodrich & Rosati Professional Corporation, 650 Page Mill Road, Palo Alto, CA 94304-1050. (R)

146. *United Video Properties, Inc. et al. v. Haier Group Corp. et al.*, C.A. No. 11-1140-KAJ (D.Del.). Served as an expert for Plaintiffs in a case alleging infringement of U.S. Patents 6,701,523 and 7,047,547, relating to television parental control technology. Case has settled. Contact: Hong S. Lin, Esq., Paul Hastings LLP, 1117 S. California Avenue, Palo Alto, CA 94304. (D,R)

147. *Droplets, Inc. v. E*TRADE Financial Corporation et al.*, Case No.: 1:12-CV-02326-CM (S.D.N.Y.). Served as an expert for defendants in an action alleging infringement of U.S. Patents 6,687,745 and 7,502,838, and 8,402,115, relating to delivering interactive links for presenting applications on a client computer. Defendants prevailed on a summary judgment of non-infringement on the '745 Patent. All claims of the '115 and '838 Patents were found invalid after IPRs, affirmed by the Federal Circuit in 2016-2504 and 2016-2602. Contact: Michael Levin, Esq., Wilson Sonsini Goodrich & Rosati Professional Corporation, 650 Page Mill Road, Palo Alto, CA 94304-1050. (D,R,T)

148. *Symantec Corporation v. Acronis, Inc. et al.*, Case No. 3:11-cv-05331 JST (N.D. Cal.). Served as an expert for plaintiff and infringement counterclaim defendant Symantec in a case alleging infringement by Symantec of U.S. Patents 7,366,859 and 7,831,789, relating to incremental disk backup, and infringement by Acronis of U.S. Patent 7,024,527, and 7,996,708, relating to disk backup and restore, U.S. Patent 7,454,592, and U.S. Patent 7,941,459, relating to single instance disk storage, and U.S. Patent 7,680,957, relating to modifiable representations of computer configurations. Case has settled. Contact: Jennifer Kash, Esq., Quinn Emanuel Urquhart & Sullivan LLP, 50 California Street, 22nd Floor, San Francisco, California 94111. (D,R)

149. *Jazz Pharmaceuticals, Inc. v. Roxane Laboratories, Inc.*, CA 2:10-cv-06108-ES-MCA (D. N.J.). Served as an expert for defendant in a case alleging infringement of U.S. Patents 7,668,730, 7,765,106, 7,765,107, 7,797,171 and 7,895,059, relating to methods of controlling the distribution of sensitive drugs. Case has settled. Contact: Alan B. Clement, Esq., Locke Lord LLP, Brookfield Place, 200 Vesey Street, 20th Floor, New York, NY 10281-2101. (R)

150. *TuitionFund, LLC v. SunTrust Banks, Inc. et al.*, CA 3:11-cv-00069 (M.D. Tenn.). Served as an expert for defendants Cardlytics, Inc., Regions Financial Corp., and Regions Bank in a case alleging infringement of U.S. Patents 7,499,872, 7,653,572 and 7,899,704, relating to methods for awarding rebates for credit and debit card purchases. Case settled. Contact: Michael S. Connor, Esq., Alston & Bird LLP, Bank of America Plaza, 101 South Tryon Street, Suite 4000, Charlotte, NC 28280-4000. (D,R)

151. *Pollin Patent Licensing, LLC et al. v. AT&T Corporation et al.*, Case No. 1:11-cv-07855 (N.D. Ill.). Served as an expert for defendants in a case alleging infringement of U.S. Patent 7,117,171, relating to verifying financial institution identification in electronic payment systems. Case has settled. Contact: James L. Howard, Esq., Kilpatrick Townsend & Stockton LLP, 1001 West Fourth Street Winston-Salem, NC, 27101.

152. *PPS Data, LLC v. Bluepoint Solutions, Inc.*, Case 2:13-cv-01351 (D. Nev.). Served as an expert for plaintiff in a case alleging infringement of U.S. Patents 7,181,430, 7,216,106,

7,440,924, 7,624,071 and 8,126,809, relating to methods for processing check images in electronic payment systems. Case has settled. Contact: Anthony H. Son, Esq., Maddox Edwards, PLLC, 1900 K Street NW, Suite 725, Washington, DC 20006. (Original firm: Wiley Rein).

153. *e-LYNXX Corporation v. Ariba, Inc.*, CA 1:12-cv-01771-CCC (M.D. Pa.). Served as an expert for defendant Ariba, in a case alleging infringement of U.S. Patents 7,451,106, 7,788,143 and 8,209,227, relating to electronic procurement of customized goods and services. Case has settled. Contact: Amy Van Zant, Esq., Covington & Burling LLP, 333 Twin Dolphin Drive, Redwood Shores, CA 94605-1418.

154. *EMG Technology, LLC v. AutoZone, Inc.*, C.A. 6:13-cv-134 (E.D. Tex.) (Lead case: 6:12-cv-543). Served as an expert for defendant AutoZone in a case alleging infringement of U.S. Patent 7,441,196, relating to transcoding web sites into mobile sites. Defendant obtained summary judgment of non-infringement. Contact: Terry L. Clark, Esq., Bass, Berry & Sims PLC, 1201 Pennsylvania Ave. N.W., Washington, D.C. 20004. (R)

155. *In re: Oil Spill by the Oil Rig "Deepwater Horizon" in the Gulf of Mexico, on April 20, 2010*, MDL No. 2179 (E.D. La.). Served as an expert for litigants BP Exploration & Production Inc. et al. on an issue relating to identification of an anonymous person through Internet searching. Contact: Mark. J. Nomellini, Esq., Kirkland & Ellis LLP, 300 N. LaSalle, Chicago, IL 60654. (R)

156. *EC Data Systems, Inc., v. J2 Global, Inc. et al.*, CV 12-07544 (C.D. Cal.). Served as an expert for declaratory judgment plaintiff EC Data Systems in a case alleging infringement of U.S. Patents 6,208,638 and 6,350,066, 6,597,688 and 7,020,132, relating to electronic distribution of faxes through email. Case has settled. Contact: Matthew Spohn, Esq. Norton Rose Fulbright LLP., Tabor Center, 1200 17th Street, Suite 1000, Denver, Colorado 80202.

157. *MoneyCat, Ltd. v. PayPal, Inc.*, CA 1:13-cv-01358-RGA (D. Del.), now 3:14-cv-02490-PSG (N.D. Cal.). Served as an expert for defendant PayPal in a case alleging infringement of U.S. Patents 7,590,602, 8,195,578 and 8,051,011, relating to issuance and transfer of electronic currency. On CBM review, the PTAB found all asserted claims of all three patents invalid, affirmed by the Federal Circuit. Case was subsequently dismissed. Contact: Adrian Percer, Esq., Weil, Gotshal & Manges, LLP, 201 Redwood Shores Parkway, Redwood Shores, CA 94065. (D,R)

158. *GSI Commerce Solutions, Inc.* v. *Clear With Computers, Inc.*, Patent Trial and Appeal Board Case CBM2013-00055. Served as an expert for petitioner, an eBay company, in a covered business method review of U.S. Patent 8,266,015, relating to methods of presenting lists of product customization options. Review was instituted but the CBM was terminated by settlement. Contact: Scott McKeown, Esq., Ropes & Gray, L.L.P., 2099 Pennsylvania Avenue, Washington, DC 20006-6807. (D,R)

159. *Fidelity National Information Services, Inc. v. Cashedge, Inc. and Checkfree Corporation*, Patent Trial and Appeal Board Cases CBM2013-00028, 30, 31 and 32. Served as

an expert for petitioner in covered business method reviews of U.S. Patents 7,383,223, 7,792,749, 7,853,524 and 7,996,311, relating to transferring funds in electronic payment networks. Reviews have been instituted. All claims of the four patents were invalidated by the PTAB in December 2014. Appeal was taken to the Federal Circuit but terminated by agreement. Contact: Jeffrey A. Berkowitz, Esq., Finnegan, Henderson, Farabow, Garrett & Dunner, L.L.P., Two Freedom Square, 11955 Freedom Drive, Reston, VA 20190-5675. (D,R)

160. *Boku, Inc. v. Xilidev, Inc.*, Patent Trial and Appeal Board Cases CBM2014-00140 and CBM2014-00148. Served as an expert for petitioner in two covered business method reviews of U.S. Patent 7,273,168, relating to authorizing payments via handheld devices. Result: claims 1-18 and 20-23 found invalid. Claim 19 cancelled. Contact: Frank Pietrantonio, Esq., Cooley LLP, One Freedom Square, 11951 Freedom Drive, Reston, VA 20190. (R)

161. *Protegrity Corporation v. Phoenix Payment Systems, Inc. d/b/a Electronic Payment Exchange*, Case No. 3:13-CV-1386-VKB (D. Conn.). Served as an expert for defendant in a case alleging infringement of U.S. Patents 6,321,201 and 8,402,281, relating to methods of encrypting databases. Case has settled. Contact: David J. Wolfsohn, Esq., Duane Morris LLP, 20 South 17th Street, Philadelphia, PA 19103. (R)

162. *Ameranth, Inc. v. Genesis Gaming Solutions, Inc. et al.*, Case No. SACV 8:11-0189-AG (C.D. Cal.). Served as an expert for Ameranth in a case alleging infringement of U.S. Patents 7,431,650, 7,878,909 and 8,393,969, relating to systems for managing casino operations, particularly in poker rooms. Case has settled. Contact: John W. Osborne, Esq., Osborne Law LLC, 33 Habitat Lane, Cortlandt Manor, NY 10567. (D,R)

163. *Telebuyer, LLC v. Amazon.com, Inc.*, Case No. 2:13-cv-01677-BJR (W.D. Wash.). Served as an expert for Telebuyer in a case alleging infringement by Amazon.com of U.S. Patents 6,323,894, 7,835,508, 7,835,509, 7,839,984, 8,059,796, 8,098,272, and 8,315,364, relating to systems for interfacing buyers and sellers via communication networks. Summary judgment was entered declaring all asserted claims invalid under 35 U.S. §101. Contact: Brian Berliner, Esq., O'Melveny & Myers LLP, 400 South Hope Street, Los Angeles, CA 90071. (D,R)

164. *GlobeRanger Corporation v. Software AG, et al.*, Civil Action No. 3:11-CV-403-B (N.D. Texas). Served as an expert for GlobeRanger in a case alleging misappropriation of trade secrets and civil conspiracy involving radio-frequency identification (RFID) software and business processes. Result: jury verdict of $15 million in favor of GlobeRanger, upheld on appeal to the Fifth Circuit. Contact: Ophelia Camiña, Esq., Susman Godfrey, L.L.P., 901 Main St., Suite 5100, Dallas, TX 75202-3775. (D,R,T)

165. *In re: ProvideRx of Grapevine, LLC and CERx Pharmacy Partners, LP v. Provider Meds, LP, et al.*, Adv. Proc. No. 13-03015-BJH (Bankr. N.D. Tex). Served as an expert for creditor CERx in a Chapter 7 bankruptcy case involving security interests in software for remote dispensing pharmacies and whether certain licenses constitute encumbrances under Texas law. Case has settled. Contact: Bill Whitehill, Esq., Gardere Wynne Sewell LLP, 1601 Elm St., Dallas, TX 75201. (R)

166. *Square, Inc. v. Protegrity Corporation*, CBM2014-00182, Patent Trial and Appeal Board (2014). Served as an expert for petitioner in a covered business method petition seeking review of U.S. Patent 8,402,281, relating to methods of encrypting databases. Result: all claims invalid under §101. Contact: Matthew Argenti, Esq., Wilson Sonsini Goodrich & Rosati Professional Corporation, 650 Page Mill Road, Palo Alto, CA 94304-1050. (D,R)

167. *VigLink, Inc. v. Linkgine, Inc.*, Patent Trial and Appeal Board (2014). Served as an expert for petitioner in covered business method petitions 2014-00184 and 2014-00185 seeking review of U.S. Patents 7,818,214 and 8,027,883, relating to modifying affiliate links on webpages. Result: all challenged claims found invalid. Affirmed by the Federal Circuit at 2016-2087, 2016-2088. Contact: Robert C. Hilton, Esq., McGuireWoods LLP, 2000 McKinney Ave., Suite 1400, Dallas, TX 75201. (R)

168. *Juhline et al. v. Ben Bridge Jewelers Inc. et al.*, Case 11-cv-2096-GPC-NLS (S.D. Cal.). Served as an expert for defendant Ben Bridge in a class action alleging violation of California Civil Code §1747.8, relating to the collection of personal identification information in connection with credit card transactions. Case has settled. Contact: Rosemarie T. Ring. Esq., Munger, Tolles & Olson LLP, 560 Mission St., 27th Fl., San Francisco, CA 94105.

169. *Catch Curve, Inc. v. Integrated Global Concepts, Inc. v. j2 Global Communications, Inc. et al.*, Case 1:06-CV-02199 (N.D. Ga.). Served as an expert for defendant and counterclaim plaintiff Integrated Global Concepts in a case alleging infringement of U.S. Patents 4,994,926, 5,291,302, 5,459,584, 6,643,034, 6,785,021, 7,365,884 and 7,525,691, relating to store-and-forward fax systems. Infringement claims were dropped. The issue at bar is whether j2 Global had an objective basis to believe that Integrated Global was infringing. Case has settled. Contact: James Heiser, Esq., Chapman and Cutler, LLP, 111 West Monroe St., Chicago, IL 60603. (D,R)

170. *Phoenix Payment Systems, Inc. v. Protegrity Corporation*, CBM2014-00121, Patent Trial and Appeal Board (2014). Served as an expert for petitioner in a covered business method petition seeking review of U.S. Patent 8,402,281, relating to methods of encrypting databases. Underlying litigation settled before CBM could be instituted. Contact: Contact: David J. Wolfsohn, Esq., Duane Morris LLP, 20 South 17th Street, Philadelphia, PA 19103. (R)

171. *Informatica Corporation v. Protegrity Corporation*, CBM2015-00010, CBM2015-00021, Patent Trial and Appeal Board (2014). Served as an expert for petitioner in two covered business method petitions seeking review of U.S. Patents 8,402,281 and 6,321,201, relating to methods of encrypting databases. Result: all claims found invalid under 35 U.S.C. §101. The Board's opinions in the '201 case and the '281 case comment favorably on Dr. Shamos's testimony. Contact: Mark S. Kaufman, Esq., Reed Smith LLP, 1301 K Street N.W., Washington, DC 20005. (D,R)

172. *Qualtrics, LLC v. OpinionLab, Inc.*, IPR2014-00314, IPR2014-00356, IPR2014-00366, IPR2014-00406, IPR2014-00420, and IPR2014-00421, Patent Trial and Appeal Board (2014). Served as an expert for patent owner OpinionLab, Inc. in *inter partes* reviews of U.S. Patents 6,421,724, 6,606,581, 8,041,805, 7,085,820, 7,370,285 and 8,024,668, relating to

methods of soliciting page-specific feedback regarding web pages. All challenged claims have been found invalid except as to the '805 patent. '724 was not instituted. Contact: Chris Kennerly, Esq., Paul Hastings LLP, 1117 S. California Ave., Palo Alto, CA 94304. (D,R)

173. *Callwave Communications, LLC v. AT&T Mobility, LLC et al.*, Case 1:12-cv-01788-RGA (D. Del.). Served as an expert for defendant Research In Motion, Corp. in a case alleging infringement of U.S. Patent 7,907,933, relating to methods of billing for purchases by placing a call to a pay-per-call service. Plaintiff stipulated to non-infringement for appeal purposes, but the Federal Circuit upheld on January 10, 2017. Contact: John V. Gorman, Esq., Morgan, Lewis & Bockius LLP, 1701 Market Street, Philadelphia, PA 19103.

174. *SoftVault Systems, Inc. v. Dassault Systèmes Solidworks Corporation*, Case 5:14-cv-03221-LHK (N.D. Cal.). Served as an expert for defendant Solidworks. in a case alleging infringement of U.S. Patents 6,249,868 and 6,594,765 relating to embedded agents for protecting computer systems against theft. Case has settled. Contact: Cheryl T. Burgess, Esq., Knobbe, Martens, Olson & Bear, L.L.P., 2040 Main Street, 14th Floor Irvine, CA 92614.

175. *PPS Data, LLC v. TransCentra, Inc.*, Case 13-359-LPS (D. Del.). Served as an expert for plaintiff in a case alleging infringement of U.S. Patents 7,181,430, 7,440,924, 7,624,071 and 8,126,809, relating to methods for processing check images in electronic payment systems. Case has settled. Contact: Anthony H. Son, Esq., Maddox Edwards, PLLC, 1900 K Street NW, Suite 725, Washington, DC 20006. (Original firm: Wiley Rein).

176. *Clear With Computers, Inc. v. Spanx, Inc.*, C.A. 6:12-cv-950-LED (E.D. Texas). Served as an expert for defendant, an eBay company, in a case alleging infringement of U.S. Patent 8,266,015, relating to methods of presenting lists of product customization options. Judgment on the pleadings was granted, invalidating the asserted claims under 35 U.S.C. §101. Case was appealed to the Federal Circuit, but the appeal with withdrawn. Case has settled. Contact: Scott McKeown, Esq., Oblon, Spivak, McClelland, Maier & Neustadt, L.L.P., 1940 Duke Street Underpass, Alexandria, VA 22314.

177. *Integrated Global Concepts, Inc. v. Advanced Messaging Technologies, Inc.*, IPR2014-01027 and IPR2014-01028 Patent Trial and Appeal Board (2014). Served as an expert for petitioner seeking *inter partes* review of U.S. Patents 6,020,980, relating to delivering faxes through electronic mail. The PTAB declined to institute review. Contact: Robert J. Schneider, Esq., Taft Stettinius & Hollister LLP, 111 East Wacker, Suite 2800, Chicago, IL 60601. (R)

178. *athenahealth, Inc. v. AdvancedMD Software, Inc.*, Civil Action 1:11-cv-11260-GAO (D. Mass.). Served as an expert for plaintiff athenahealth, Inc. in a case alleging infringement of U.S. Patents 7,617,116 and 7,720,701, relating to detecting errors in medical insurance claim submissions and automated configuration of medical practice management systems. Case has settled. Contact: Robert M. Abrahamsen, Esq., Wolf, Greenfield & Sacks, P.C., 600 Atlantic Avenue, Boston, MA 02210.

179. *CEATS, Inc. v. Orbitz Worldwide, Inc.*, Civil Action 2:13-cv-01385-MMD-PAL (D. Nev.). Served as an expert for plaintiff in a case alleging infringement of U.S. Patents

7,548,867, 7,640,178, 7,660,727, 8,219,448, 8,229,774 and 8,244,561, relating to systems and methods for managing airline seat reservations. Case has settled. Contact: Jared Bunker, Esq., Knobbe, Martens, Olson & Bear, L.L.P., 2040 Main Street, 14th Floor Irvine, CA 92614.

180. *Audatex North America, Inc. v. Mitchell International, Inc.*, Civil Action 3:13-cv-01523-BEN (BLM) (S.D. Cal.). Served as an expert for plaintiff in a case alleging infringement of U.S. Patents 7,912,740, 8,200,513 and 8,468,038, relating to systems and methods for determining the valuation of a damaged vehicle for insurance purposes. Claims found invalid after CBM review, affirmed by the Federal Circuit. Contact: David McPhie, Esq., Irell & Manella LLP, 840 Newport Center Dr., Newport Beach, CA 29660. (R)

181. *Skimlinks, Inc. et al. v. Linkgine, Inc.*, Patent Trial and Appeal Board (2015). Served as an expert for petitioners in covered business method petitions 2015-00086 and 2015-00087 seeking review of U.S. Patents 7,818,214 and 8,027,883, relating to modifying affiliate links on webpages. Result: all claims found invalid, affirmed by the Federal Circuit. Contact: Richard F. Martinelli. Esq., Orrick, Herrington & Sutcliffe LLP, 51 West 52nd St., New York, NY 10019. (R)

182. *Advanced Auctions, LLC. v. eBay, Inc.*, Case 12-cv-1612-BEN (JLB) (S.D. Cal.). Served as an expert for defendant eBay in case alleging infringement of U.S. Patent 8,266,000, relating to methods of conducting Internet auctions. Defendant obtained judgment of invalidity on the pleadings under 35 U.S.C. §101. Contact: Adrian Percer, Esq., Weil, Gotshal & Manges, LLP, 201 Redwood Shores Parkway, Redwood Shores, CA 94065.

183. *MaxMind, Inc. et al. v. Fraud Control Systems.com Corporation*, CBM2015-00094, Patent Trial and Appeal Board (2014). Served as an expert for petitioner in a covered business method petition seeking review of U.S. Patent 8,630,942, relating to methods of determining whether a payment transaction may be fraudulent based on IP addresses. Review was instituted on §101 grounds and Patent Owner requested adverse judgment. Contact: Anthony H. Son, Esq., Maddox Edwards, PLLC, 1900 K Street NW, Suite 725, Washington, DC 20006. (R)

184. *Square, Inc. v. Unwired Planet, LLC*, CBM2014-00156, Patent Trial and Appeal Board (2014). Served as an expert for petitioner in a covered business method petition seeking review of U.S. Patent 7,711,100, relating to conducting point-of-sale transactions based on the location of a wireless device. Challenged claims found invalid. Contact: Sasha G. Rao, Esq., Maynard Cooper and Gale PC, 275 Battery St., San Francisco, CA 94111 (D,R)

185. *Unified Patents, Inc. v. Finnavations LLC*, IPR2015-01209, Patent Trial and Appeal Board (2015). Served as an expert for petitioner in an inter partes review of U.S. Patent 8,132,720, relating to verifying online transaction data through a graphical user interface. Status: not instituted. Contact: Paul C. Haughey, Esq., Kilpatrick Townsend & Stockton LLP, Eighth Floor, Two Embarcadero Center San Francisco, CA 94111 (R)

186. *Hoskin Hogan et al. v. BP West Coast Products LLC et al.*, Case BC 460880 (Super. Ct. Los Angeles Cty. CA, 2011). Served as an expert for defendant Retalix Ltd., alleging negligence in the development and testing of software for processing point-of-sale transactions. Summary

judgment granted in favor of Retalix. Contact: Richard H. Zelichov, Esq., Katten Muchin Rosenman LLP, 2029 Century Park East, Suite 2600, Los Angeles, CA 90067-3012. (D,R)

187. *In re U.S. Patent Application 12/912,726* (USPTO). Served as an expert for applicant AlmondNet, Inc. in an application for a patent relating to distributing digital advertising based on a recipient profile. PTAB affirmed the Examiner's § 101 rejection. Contact: Louis J. Hoffman, Esq., Hoffman Patent Firm. (R)

188. *Wickfire, LLC v. TriMax Media, Inc. et al.*, C.A. 1:14-CV-34 (W.D. Tex). Served as an expert for defendants in a case alleging click fraud in Internet advertising. Jury verdict for Plaintiff, reversed on appeal to the Fifth Circuit. Contact: Barry M. Golden, Esq., Miller, Egan, Molter & Nelson LLP, 2911 Turtle Creek Blvd., Suite 1100 Dallas, TX 75219. (D,R,T)

189. *Square, Inc. v. Unwired Planet, LLC*, CBM2015-00148, Patent Trial and Appeal Board. Served as an expert for petitioner in a covered business method petition seeking review of U.S. Patent 7,711,100, relating to conducting point-of-sale transactions based on the location of a wireless device. Not instituted because claims were found invalid under § 101 in CBM2014-00156. Contact: Sasha G. Rao, Esq., Maynard Cooper and Gale PC, 275 Battery St., San Francisco, CA 94111. (D,R)

190. *Datatrak International Inc. v. Medidata Solutions, Inc.*, C.A. 1:11-cv-00458-PAG (N.D. Ohio). Served as an expert for defendant in a case alleging infringement of U.S. Patent 7,464,087, relating to federated database queries. Defendant obtained summary judgment of invalidity under 35 U.S.C. §101. Contact: Duane-David Hough, Esq., Mayer Brown LLP, 1675 Broadway, New York, NY 10019. (R)

191. *SNMP Research, Inc. et al. v. Avaya, Inc.*, C.A. 1:12-cv-00191-RGA-MPT (D. Del.). Served as an expert for Avaya in an action alleging breach of contract, trade secret misappropriation and copyright infringement involving software implementing the Simple Network Management Protocol (SNMP). Case has settled. Contact: Joshua Krumholz, Esq., Holland & Knight, LLP, 10 St. James Avenue, 11th Floor, Boston, MA 02116. (D,R)

192. *Certain Automated Teller Machines and Point of Sale Devices and Associated Software Therefor*, USITC Inv. No. 337-TA-958. Served as an expert for Respondents NRT Technology Corp. et al. in an International Trade Commission proceeding brought by Complainant Global Cash Access Inc. involving alleged infringement of U.S. Patent 6,081,792, relating to structuring ATM and POS transactions with respect to withdrawal limits. Result: all claims found invalid as indefinite. In affirming this determination, the Commission wrote: "should the extrinsic evidence be considered, the Commission finds NRT's expert testimony credible, see Rebuttal Expert Report of Michael Shamos Regarding Claim Construction ¶¶ 52-58, and that Everi's expert's testimony is not credible." Contact: Colby B. Springer, Esq., Polsinelli LLP (formerly at Lewis Roca Rothgerber LLP), Three Embarcadero Center, Suite 1350, San Francisco, CA 94111. (D,R)

193. *Better Mouse Company, L.L.C. v. SteelSeries ApS, Inc. et al.*, C.A. 2:14-cv-198-JRG (E.D. Texas). Served as an expert for defendant in a case alleging infringement of U.S. Patent

7,532,200, relating to computer mouse whose resolution can be set without external software. Dr. Shamos testified at trial on non-infringement. The jury found for defendant on non-infringement. Contact: Joshua M. Masur, Esq., Zuber Lawler & Del Duca LLP, 2000 Broadway, Suite 154, Redwood City, California 94063. (Original firm: Turner Boyd LLP) (R,T)

194. *Vesta Corporation v. Amdocs Management Limited et al.*, No. 3:14-cv-01142-HZ (D. Ore.). Served as an expert for defendants in a case alleging misappropriation of trade secrets relating to billing in the prepaid mobile phone payment processing market. Case has settled. Contact: Yonaton M. Rosenzweig, Esq., Katten Muchin Rosenman LLP, 2029 Century Park East, Suite 2600, Los Angeles, CA 90067-3012. (D,R)

195. *Benefit Funding Systems, LLC et al. v. U.S. Bancorp*, CA 1:12-cv-00803-LPS (D.Del.). Served as an expert for defendant U.S. Bancorp in an action alleging infringement of U.S Patent 6,625,582, relating to a method of establishing a financial account based on the present value of future retirement payments. All asserted claims were found invalid under 35 U.S.C. §101, a decision affirmed by the Federal Circuit. Contact: Contact: Anthony H. Son, Esq., Maddox Edwards, PLLC, 1900 K Street NW, Suite 725, Washington, DC 20006. (Original firm: Wiley Rein).

196. *Telesign Corporation v. Twilio, Inc.*, C.A. 3:18-cv-03279-VC (N.D. Cal.). Served as an expert for defendant Twilio in an action alleging infringement of U.S. Patent 7,945,034, relating to verification of telephone users based on characteristics of the telephone number, such as carrier and geographic location. Defendant successfully resisted issuance of a preliminary injunction. Case is stayed pending PTAB review. After PTAB review, Twilio's motion for judgment on the pleadings was granted. Contact: Thomas J. Friel, Jr., Esq., Cooley LLP, 3175 Hanover Street, Palo Alto, CA 94304. (R)

197. *Cronos Technologies, LLC v. Expedia, Inc.*, C.A. 13-1538-LPS (D. Del.), *Cronos Technologies, LLC v. Priceline.com, Inc.*, C.A. 13-1541-LPS (D. Del.) and *Cronos Technologies, LLC v. Travelocity.com L.P.*, C.A. 13-1544-LPS (D. Del.). Served as an expert for defendants in three cases, consolidated for some purposes, in actions alleging infringement of U.S. Patent 5,664,110, relating to a remote ordering system enabling a user to build lists of products to be ordered. The Court found non-infringement on summary judgment, affirmed unanimously by the Federal Circuit. Contact: Matthew C. Acosta, Esq., Jackson Walker LLP, KPMG Plaza at Hall Arts, 2323 Ross Avenue, Suite 600, Dallas, TX 75201. (D,R)

198. *Ex Parte Reexamination of U.S. Patent 7,333,430*, Control No. 90/013,532. Served as an expert for patent owner Fortinet, Inc. in a reexamination of U.S. Patent 7,333,430, drawn to distributing network packets for intermediate security processing based on the ultimate destination of the packet. Result: all challenged claims and newly presented claims patentable. Contact: Michael A. DeSanctis, Hamilton DeSanctis & Cha LLP, Financial Plaza at Union Square, 225 Union Boulevard, Ste. 150, Lakewood, CO 80228. (R)

199. *ServiceNow, Inc. v. Hewlett-Packard Company*, Case IPR2015-00717 (PTAB). Served as an expert for patent owner Hewlett-Packard Company in an inter partes review of U.S. Patent 7,027,411, drawn to efficient determination of changes in network topology. Status: settled.

Contact: Monica Grewal, Esq., Wilmer Cutler Pickering Hall and Dorr LLP, 60 State Street, Boston, MA 02109. (D,R)

200. *Intellectual Ventures I LLC v. Nextel Operations, Inc. and Sprint Spectrum L.P.*, C.A. No. 13-1634 (D.Del) and related cases 13-1635; *Intellectual Ventures I LLC v. T-Mobile USA, Inc. et al.*, C.A. No. 13-1632; 13-1633; *Intellectual Ventures I LLC v. United States Cellular Corporation*, C.A. No. 13-1636 and related case 13-1637, all D. Del. Served as an expert for defendants Sprint, T-Mobile and U.S. Cellular in related cases alleging infringement of U.S. Patent 6,115,737, drawn to use of an Internet gateway for processing customer service requests to a web server. The Court invalidated the '737 patent on §101 grounds. Contact: Jason W. Cook, Esq., McGuireWoods LLP, 2000 McKinney Ave., Suite 1400, Dallas, TX 75201. (D,R)

201. *Ex Parte Reexamination of U.S. Patent 7,968,744*, Control No. 90/013,533. Served as an expert for patent owner Fortinet, Inc. in a reexamination of U.S. Patent 7,698,744, drawn to systems and methods for allowing execution of authorized computer code and for protecting computer systems and networks from unauthorized code execution. Result: challenged claim and 14 new claims determined patentable. Contact: Michael A. DeSanctis, Hamilton DeSanctis & Cha LLP, Financial Plaza at Union Square, 225 Union Boulevard, Ste. 150, Lakewood, CO 80228. (R)

202. *Ex Parte Reexamination of U.S. Patent 7,376,125*, Control No. 90/013,531. Served as an expert for patent owner Fortinet, Inc. in a reexamination of U.S. Patent 7,376,125, drawn to a virtual routing engine for software-based packet routing. Result: newly presented claims patentable. Contact: Michael A. DeSanctis, Hamilton DeSanctis & Cha LLP, Financial Plaza at Union Square, 225 Union Boulevard, Ste. 150, Lakewood, CO 80228. (R)

203. *Twilio, Inc. v. Telesign Corporation*, IPR2016-00360. Served as an expert for requester Twilio in an *inter partes* review of U.S. Patent 7,945,034, relating to verification of telephone users based on characteristics of the telephone number, such as carrier and geographic location. Challenged claims confirmed. Contact: Thomas J. Friel, Jr., Esq., Cooley LLP, 3175 Hanover Street, Palo Alto, CA 94304. (D,R)

204. *Twilio, Inc. v. Telesign Corporation*, IPR2016-00450, Patent Trial and Appeal Board (2016). Served as an expert for petitioner in an *inter partes* review of U.S. Patent 8,462,920, relating to verification of telephone users based on characteristics of the telephone number, such as carrier and geographic location. Trial was not instituted. Contact: Contact: Carrie J. Richie, Esq., Cooley LLP, 3175 Hanover Street, Palo Alto, CA 94304. (R)

205. *Smart Systems Innovations, LLC v. Chicago Transit Authority, et al.*, C.A. 14-cv-08053 (N.D. Ill.). Served as an expert for defendants in an action alleging infringement of U.S. Patent 5,828,044, relating to a radio-frequency ID (RFID) credit card system. Defendant successfully resisted issuance of a preliminary injunction. All claims invalidated as non-statutory under 35 U.S.C. §101. Affirmed by the Federal Circuit in October 2017. Contact: Jeffrey M. Connor., Esq., formerly at Kilpatrick Townsend & Stockton LLP, now IP counsel at Honeywell. (D,R)

206. *Unwired Planet LLC v. Google, LLC*, C.A. 3:12-cv-00504-MMD-VPC (D. Nevada). Served as an expert for Google in an action alleging infringement of U.S. Patents 6,292,657, 6,654,786, 6,662,016, 6,684,087, 6,895,240, 6,944,760, 7,024,205, 7,035,647, 7,203,752 and 7,463,151, relating to provision of wireless services. All asserted claims of the '151, '205 and '751 patents have been found invalid by the Patent Trial and Appeal Board. After appeal to the Federal Circuit, the case continued with respect to certain claims of the '752 Patent but these were dismissed by stipulation. Contact: Peter E. Gratzinger, Esq., Munger, Tolles & Olson LLP, 355 South Grand Avenue, Los Angeles, CA 90071.

207. *Xilidev, Inc. v. Boku, Inc. et al.*, C.A. 3:13-cv-02793 (S.D. Cal.). Served as an expert for defendants in an action alleging infringement of U.S. Patent 7,273,168, relating to point-of-sale billing on handheld devices. Claims 1-18 and 20-23 of the '168 patent have been found invalid by the Patent Trial and Appeal Board. Plaintiff agreed to a voluntary dismissal with prejudice. Contact: Frank Pietrantonio, Esq., Cooley LLP, One Freedom Square, 11951 Freedom Drive, Reston, VA 20190.

208. *Intellectual Ventures II LLC v. Commerce Bancshares, Inc. et al.*, C.A. 2:13-CV-04160 (W.D. Mo.). Served as an expert for defendants in an action alleging infringement of U.S. Patents 5,745,574, relating to security in electronic transactions, 6,314,409 and 6,826,694, relating to controlling access to digital property, 6,715,084, relating to intrusion detection, and 7,634,666, relating to a cryptographic engine. All asserted claims have been declared invalid by the Patent Trial and Appeal Board. Decision affirmed by the Federal Circuit in December 2016. Contact: Mark Vander Tuig, Esq., Senniger Powers LLP, 100 North Broadway, 17th Floor, St. Louis, MO 63102.

209. *Hy-Vee, Inc. v. Inmar Digital Promotions Network, Inc.*, C.A. 4:15-cv-00275 (S.D. Iowa). Served as an expert for defendant in an action seeking indemnity for infringement of U.S. Patents 8,219,445, 8,370,199 and 8,538,805, relating to point-of-sale processing of promotions, such as coupons. Hy-Vee had been sued for infringing these patents in *Advanced Marketing Systems, LLC v. Hy-Vee, Inc.*, C.A. 3:15-cv-00103 (W.D. Wisc.). Both cases have settled. Contact: Richard J. Keshian, Esq., Kilpatrick Townsend & Stockton LLP, 1001 West Fourth Street Winston-Salem, NC, 27101. (R)

210. *Motivation Innovations, LLC v. PetSmart, Inc.*, C.A. 1:13-cv-00957 (D.Del.). Served as an expert for defendant in an action alleging infringement of U.S. Patent 5,612,527, relating to a system for redeeming discount offers at point of sale. On motion for judgment on the pleadings, all asserted claims were found invalid under 35 U.S.C. §101. Contact: Kevin A. Zeck, Esq., Perkins Coie, LLP, 1201 Third Avenue, Suite 4900, Seattle, WA 98101-3099.

211. *PPS Data, LLC v. VSoft Corporation et al.*, Case 1:15-cv-00084 (N.D. Ga.). Served as an expert for plaintiff in a case alleging infringement of U.S. Patents 7,181,430, 7,216,106, 7,440,924, 7,624,071 and 8,660,956, relating to methods for processing check images in electronic payment systems. Case has settled. Contact: Anthony H. Son, Esq., Maddox Edwards, PLLC, 1900 K Street NW, Suite 725, Washington, DC 20006 (original firm Andrews Kurth).

212. *Sally Beauty Holdings et al. v. Intellectual Ventures I LLC*, CBM2016-00029, Patent Trial and Appeal Board. Served as an expert for petitioner in a covered business method petition seeking review of U.S. Patent 5,969,324, relating to accounting methods utilizing a non-predictable bar code. Trial was instituted, the PTAB writing in its decision: "We credit the testimony of Dr. Michael Shamos." Case has settled. Contact: Derek Swanson, Esq., McGuireWoods LLP, Gateway Plaza, 800 East Canal Street, Richmond, VA 23219. (R)

213. *Square, Inc. v. Protegrity Corporation*, CBM2015-00014, Patent Trial and Appeal Board (2016). Served as an expert for petitioner in a covered business method petition seeking review of U.S. Patent 6,321,201, relating to methods of encrypting databases. Result: all challenged claims found invalid under 35 U.S. §§101 and 103. Contact: Matthew Argenti, Esq., Wilson Sonsini Goodrich & Rosati Professional Corporation, 650 Page Mill Road, Palo Alto, CA 94304-1050. (R)

214. *T-Mobile US, Inc. v. Intellectual Ventures II LLC*, CBM2016-00083, Patent Trial and Appeal Board. Served as an expert for petitioner in a covered business method petition seeking review of U.S. Patent 6,115,737, relating to use of an Internet gateway for processing customer service requests to a web server. The PTAB determined that the patent did not claim a covered business method. Contact: Alison R. Watkins, Esq., Gibson, Dunn & Crutcher LLP, 1881 Page Mill Road, Palo Alto, CA 94304-1211. (R)

215. *Twin Peaks Software, Inc. v. IBM Corporation*, Case 3:14-cv-03933-JST (N.D. Cal.). Served as an expert witness for defendant IBM in an action alleging infringement of U.S. Patent 7,418,439, relating to a system for storing and sharing networked files. All asserted claims found invalid during claim construction. Contact: Andrew Bramhall, Esq., Quinn Emanuel Urquhart & Sullivan, LLP, 555 Twin Dolphin Drive, 5th Floor, Redwood Shores, CA 94065-2139.

216. *Live Face on Web, LLC v. The Control Group Media Company, Inc. et al.*, Case 2:15-cv-01306 (E.D. Pa.). Served as an expert witness for defendants in an action alleging breach of contract and infringement of copyrights relating to web media players and video productions in which recorded actors promote products for websites. Case has settled. Contact: Damon W.D. Wright, Esq., Venable LLP, 575 Seventh St. N.W., Washington, DC 20004.

217. *Nomadix, Inc. v. Hospitality Core Services, LLC*, Case 2:14-cv-08256-DDP (C.D. Cal.) Served as an expert witness for defendant in a case alleging infringement of U.S. Patents 6,636,894 and 6,868,399, relating to network gateways, U.S. Patent 7,698,432, relating to bandwidth management, U.S. Patent 7,953,857, relating to dynamic data transfer over networks, U.S. Patent 8,266,266, relating to dynamic network authorization, and U.S. Patents 8,156,246, 8,266,269, 8,364,806, 8,725,888 and 8,788,690, relating to providing network content. Case has settled. Contact: Michael J. Mehrman, Merhman Law Office, P.C., 150 Spalding Creek Court, Sandy Springs, GA 30350.

218. *Certain Digital Video Receivers and Hardware and Software Components Thereof*, USITC Inv. No. 337-TA-1001. Served as an expert for Complainants Rovi Corporation et al. against Comcast Corporation et al. in an International Trade Commission proceeding involving alleged infringement of U.S. Patents 8,006,263 , 8,046,801 and 8,578,413, relating to remote

and local electronic TV program guides. On Final Determination, a violation was found with respect to the '263 and '413 patents. Affirmed by the Federal Circuit on March 20, 2020. Contact: Richard A. Kamprath, Esq., McKool Smith, 300 Crescent Court, Suite 1500, Dallas, TX 75201. (D,R,T)

219. *ZKey Investments, LLC v. Facebook, Inc.*, Case 2:16-cv-00782-RSWL-KS (C.D. Cal.). Served as an expert for defendant in a case alleging infringement of U.S. Patent 6,820,204, relating to providing granular control over access to data. Result: all claims found invalid under §101. Affirmed by the Federal Circuit on Jan. 10, 2018. Contact: Andrew C. Mace, Esq., Cooley LLP, 3175 Hanover Street, Palo Alto, CA 94304. (R)

220. *In re: The Matter of the 2016 Presidential Election,* 659 MD 2016 (Pa. Cmwlth. Ct., 2016). Served as an expert for intervenors opposing an action brought seeking a recount of votes in Pennsylvania on the grounds that the state's voting systems are unsecure and vulnerable to hacking by foreign actors. Petitioners discontinued the suit before hearing, refusing to post the required bond. Contact: Lawrence J. Tabas, Esq., Obermayer Rebmann Maxwell & Hippel LLP, One Penn Center, 19th Floor, 1617 John F. Kennedy Blvd., Philadelphia, PA 19103.

221. *Stein v. Cortés,* Case 2:16-cv-06287-PD (E.D. Pa.). Served as an expert for defendant Secretary of the Commonwealth of Pennsylvania in an action for a mandatory injunction to compel a recount and forensic examination of voting systems. Result: injunction denied. The Court's memorandum comments favorably on Dr. Shamos's qualification and testimony. Most claims have been dismissed on summary judgment. Case has settled. Contact: Timothy Gates, Esq., Chief Counsel, PA Department of State, 3306 North Office Bldg., Harrisburg, PA 17120. (R,T)

222. *Free Stream Media Corp. (d.b.a. Samba) v. Alphonso Inc.*, Case No. 3:17-cv-02107 (N.D. Cal., transferred from E.D. Tex.). Served as an expert for defendant Alphonso in an action alleging infringement of U.S. Patents 9,026,668 and 9,386,356, relating to a system for targeting data, such as advertising, to a device, such as a tablet, based on content that is identified as playing on a different device, such as a television. Alphonso won summary judgment of non-infringement. Contact: Neel Chatterjee, Esq., Goodwin Procter LLP, 601 Marshall Street, Redwood City, CA 94063. (D,R)

223. *Copart, Inc. v. Sparta Consulting, Inc.*, Case 2:14-cv-00046-KJM-CKD (E.D. Cal.). Served as an expert for defendant Sparta in an action alleging misappropriation of trade secrets relating to imaging batches of items to be offered at auction. Misappropriation counts were dropped during trial. Contact: Frederick Brown, Esq., Gibson, Dunn & Crutcher LLP, 555 Mission Street, Suite 3000, San Francisco, CA 94105. (D,R)

224. *Apple Inc. v. Masa LLC.*, IPR2016-00748, Patent Trial and Appeal Board (2016). Served as an expert for patent owner in an *inter partes* review of U.S. Patent 8,519,834, relating to a wearable device to alert a user to an incoming cellphone call. All challenged claims found invalid. Affirmed by the Federal Circuit. Contact: Robert M. Evans, Jr., Esq., Lewis Rice LLC, 600 Washington Avenue, Suite 2500, St. Louis, MO 63101. (R)

225. *Tele-Publishing, LLC v. Facebook, Inc. et al.*, Case 1:09-cv-11686-DPW (D. Mass.). Served as an expert for defendants in a case alleging infringement of U.S. Patent 6,253,216, relating to controlling access to information on personal web pages. Result: all claims found invalid under §101; judgment for defendants. Case settled during appeal to the Federal Circuit. Contact: Reuben Chen, Esq., Cooley LLP, 3175 Hanover Street, Palo Alto, CA 94304. (R)

226. *Groupon, Inc. v. International Business Machines Corporation*, Case 1:16-cv-5064 (N.D. Ill.). Served as an expert for Groupon in a case alleging infringement of U.S. Patent 7,856,360, relating to gathering information from attendees at a venue. Case has settled. Contact: Saina Shamilov, Esq., Fenwick & West LLP, 801 California Street, Mountain View, CA 94041. (R)

227. *Stingray Digital Group Inc. v. Music Choice*, Patent Trial and Appeal Board. Served as an expert for petitioner in six *inter partes* reviews of U.S. Patents 7,320,025 (IPR2017-00888) and 9,351,045 (IPR2017-01191), relating to providing supplementing a broadcast media service with an on-demand, personalized media service and U.S. Patents 8,769,602 (IPR2017-01192), 9,357,245 (IPR2017-1193, IPR 2018-0114), relating to providing a visual complement to an audio program, and 9,414,121 (IPR 2017-1450), relating to systems and methods for providing on-demand entertainment. Trial has been instituted in '025, '045, '121 and '602. Patent owner requested adverse judgment in IPR2017-1193. Two claims survived in IPR2018-00114. Contact: Heath Briggs, Esq., Greenberg Traurig, LLP, 1200 17th St., Suite 2400, Denver, CO 80202. (D,R)

228. *Music Choice v. Stingray Digital Group Inc. et al.*, C.A. No. 2:16-CV-0586-JRG-RSP (E.D. Texas). Served as an expert for defendants in a case alleging infringement U.S. Patents 7,320,025 and 9,351,045, relating to providing supplementing a broadcast media service with an on-demand, personalized media service, U.S. Patents 8,769,602 and 9,357,245, relating to providing a visual complement to an audio program, and U.S. Patent 9,414,121, relating to systems and methods for providing on-demand entertainment. Case has settled. Contact: Joshua Raskin, Esq., Greenberg Traurig, LLP, MetLife Bldg., 200 Park Avenue, New York, NY 10166. (R)

229. *LivePerson, Inc. v. 24[7] Customer, Inc.*, IPR2017-00609, Patent Trial and Appeal Board. Served as an expert for patent owner in an *inter partes* review of U.S. Patent 6,970,553, relating to converting a voice call into a chat session. Four of six challenged claims were not found unpatentable. Contact: Bill Trac, Esq., O'Melveny & Myers LLP, Two Embarcadero Center, 28th Floor, San Francisco, CA 94111. (R)

230. *Blackberry Limited v. Blu Products, Inc.*, Case 1:16-cv-23535-FAM (S.D. Fla.). Served as an expert for defendants in a case alleging infringement of 15 patents, including U.S. Patent 6,271,605, relating to a battery disconnect system, U.S. Patent 8,169,449, relating to a multilayer graphics controller, and U.S. Patent 8,411,845, relating to the display of call logs on mobile phones. Case has settled. Contact: Victor Castellucci, Esq., Cozen O'Connor, 2 South Biscayne Blvd., 30th Floor, Miami, FL 33131. (R)

231. *Twitter, Inc. v. YouToo Technologies, LLC.*, Patent Trial and Appeal Board. Served as an expert for patent owner in two *inter partes* reviews of U.S. Patent 9,083,997 (IPR2017-00829,

IRP2017-00830), relating to publishing content on social media sites. All challenged claims found unpatentable. Contact: Samuel E. Joyner, Esq., Carrington, Coleman, Sloman & Blumenthal, LLP, 901 Main Street, Suite 5500, Dallas, TX 75202. (R)

232. *IPDEV Co. v. Ameranth, Inc.*, Case No. 3:14-cv-01303-GPC-JLB (S.D. Cal.). Served as an expert for defendant in an action to determine priority of invention among interfering patents involving U.S. Patents 6,384,850 and 6,871,325, assigned to Ameranth and relating to synchronous updating of restaurant menus on wireless devices, and U.S. Patents 5,991,739 and 8,738,449, relating to Internet ordering methods. Consolidated with Case 233, below. On summary judgment, the Court awarded priority to Ameranth. Contact: John W. Osborne, Esq., Osborne Law LLC, 33 Habitat Lane, Cortlandt Manor, NY 10567. (D,R)

233. *In re: Ameranth Patent Litigation*, Case No. 3:11-cv-01810-DMS-WSG (S.D. Cal.). Served as an expert for Ameranth in an action against numerous defendants alleging infringement of U.S. Patents 8,146,077, relating to synchronous updating of restaurant menus on wireless devices. All asserted claims were found invalid under 35 U.S.C. § 101, affirmed by the Federal Circuit. Contact: John W. Osborne, Esq., Osborne Law LLC, 33 Habitat Lane, Cortlandt Manor, NY 10567. (D,R)

234. *Google Inc. v. Spring Ventures, Ltd.*, IPR2017-01652 and 01653, Patent Trial and Appeal Board. Served as an expert for petitioner in *inter partes* reviews of U.S. Patent 8,661,094, relating to WWW addressing. Trial instituted in 2017-01653, denied in 2017-01652. Result: all claims of the '094 patent were determined to be unpatentable. Affirmed on appeal to the Federal Circuit. At oral argument, Dr. Shamos's qualifications were challenged unsuccessfully. Contact: Scott McKeown, Esq., Ropes & Gray, L.L.P., 2099 Pennsylvania Avenue, Washington, DC 20006-6807. (D,R)

235. *Rovi Guides, Inc. et al. v. Comcast Corporation et al.*, Case No. 1:16-cv-09278-JPO (S.D.N.Y.). Served as an expert for plaintiffs in an action alleging infringement of U.S. Patent 8,713,595, relating to electronic TV program guides and 9,172,987, relating to the use of markup language to alter the functionality of set-top boxes. Case has settled. Contact: Richard A. Kamprath, Esq., McKool Smith, 300 Crescent Court, Suite 1500, Dallas, TX 75201. (D,R)

236. *StrikeForce Technologies, Inc. v. Entrust, Inc. et al.*, Case No. 1:17-cv-00309-LMB-TCB (E.D. Va.). Served as an expert for plaintiff in an action alleging infringement of U.S. Patents 8,484,698, and 8,713,701, relating to out-of-band authentication using mobile devices. Case has settled. Contact: Josef Schenker, Esq., Ropes & Gray LLP, 1211 Avenue of the Americas, New York, NY 10036. (R)

237. *Level One Technologies, Inc. v. Penske Truck Leasing Co, Inc. and Penske Logistics, LLC*, Case No. 4:14-cv-1305-RWS (E.D. Mo.). Served as an expert for defendant in an action alleging trade secret misappropriation and contractual breach of confidentiality relating to a computer system for invoicing and rendering electronic payments in the trucking industry. Case has settled. Contact: Douglas Y. Christian, Esq., Ballard Spahr LLP, 1735 Market Street, 51st Floor, Philadelphia, PA 19103. (D,R)

238. *Uniloc USA Inc. et al. v. Netsuite Inc.*, Case No. 2:16-cv-00862-RWS (E.D. Texas) and *Uniloc USA Inc. et al. v. Nutanix Inc.*, Case No. 2:16-cv-01193-RWS (E.D. Texas). Served as an expert for plaintiff on claim construction issues in an action alleging infringement of U.S. Patent 6,324,578, relating to management of configurable application programs on a network. Later, the asserted claims were found invalid under 35 U.S.C. § 101. Contact: James J. Foster, Esq., Prince Lobel Tye LLP, One International Place, Suite 3700, Boston, MA 02110. (R)

239. *Muransky v. The Cheesecake Factory, Inc. et al.*, Case 2:17-cv-07569-CJC-RAO (C.D. Cal). Served as an expert for defendants in a case involving alleged violations of the Fair Credit Reporting Act, 15 U.S.C. § 1681 ("FCRA") arising from display of more than five digits of a credit card number on customer receipts. Case has settled. Contact: John L. McManus, Esq., Greenberg Traurig, P.A., 401 E. Los Olas Blvd., Suite 2000, Fort Lauderdale, FL 33301. (R)

240. *Twilio, Inc. v. Telesign Corporation*, IPR2016-00451, Patent Trial and Appeal Board (2016). Served as an expert for petitioner in an *inter partes* review of U.S. Patent 8,687,038, relating to verifying an online registration via an out-of-band telephone connection. Trial was not instituted. Contact: Contact: Carrie J. Richie, Esq., Cooley LLP, 3175 Hanover Street, Palo Alto, CA 94304. (R)

241. *Twilio, Inc. v. Telesign Corporation*, IPR2016-01688, Patent Trial and Appeal Board (2016). Served as an expert for petitioner in an *inter partes* review of U.S. Patent 9,300,792, relating to verification of telephone users based on characteristics of the telephone number, such as carrier and geographic location. All challenged claims found unpatentable. Contact: Contact: Carrie J. Richie, Esq., Cooley LLP, 3175 Hanover Street, Palo Alto, CA 94304. (R)

242. *EdiSync Systems, LLC v. Adobe Systems, Inc.*, Civil Action 12-cv-02231-MSK-MEH (D. Colo.). Served as an expert for Defendant Adobe in a case alleging infringement of U.S. Patent 5,799,320, relating to multi-author document editing systems. Case has settled. Contact: David Sipiora, Esq., Kirkpatrick Townsend & Stockton LLP, Suite 600, 1400 Wewatta Street, Denver, CO 80202.

243. *Ford Motor Company v. Versata Software, Inc. et al.*, Case No. 2:15-cv-10628-MFL-EAS (E.D. Mich.). Served as an expert for defendant/counter-plaintiff Versata in a declaratory judgment action relating to alleged infringement of U.S. Patents 5,825,651, 6,405,308 and 6,675,294, relating to product configuration through a graphical user interface; U.S. Patent 7,882,057, relating to complex product configuration using submodels; U.S. Patents 7,200,582 and 7,464,064, relating to checking the consistency of a product configuration model using set equations; and U.S. Patent 8,805,825, relating to product configuration in which attributes are prioritized. Result: jury vedict for Versata for $105 million. Contact: Steve Mitby, Esq., Mitby Pacholder Johnson PLLC, 1001 McKinney St., Suite 925, Houston, TX 77002. (D,R)

244. *Improved Search LLC v. Microsoft Corporation*, C.A. No. 16-cv-650-JFB-SRF (D.Del.). Served as an expert for plaintiff in an action alleging infringement of U.S. Patents 6,604,101 and 7,516,154, relating to methods and systems for translingual searching. Plaintiff sought a judgment of non-infringement so claim constructions could be appealed to the Federal Circuit.

Result: affirmed. Contact: Robert Yorio, Esq., Carr & Ferrell LLP, 120 Constitution Drive, Menlo Park, CA 94025. (D,R)

245. *Comcast Cable Communications, LLC v. Rovi Guides, Inc.*, IPR2017-00866, IPR2017-00867, Patent Trial and Appeal Board. Served as an expert for patent owner in *inter partes* reviews of U.S. Patent 8,713,595, relating to electronic television program guides. All challenged claims found unpatentable. Contact: Josef B. Schenker, Ropes & Gray LLP, 1211 Avenue of the Americas, New York, NY 10036. (D,R)

246. *Comcast Cable Communications, LLC v. Rovi Guides, Inc.*, IPR2017-00950, IPR2017-00951, IPR2017-00952, Patent Trial and Appeal Board. Served as an expert for patent owner in *inter partes* reviews of U.S. Patent 8,006,263, relating to electronic television program guides. All challenged claims found unpatentable. Contact: Josef B. Schenker, Ropes & Gray LLP, 1211 Avenue of the Americas, New York, NY 10036. (D,R)

247. *Unified Patents, Inc. v. Anuwave LLC.*, IPR2018-00223, Patent Trial and Appeal Board. Served as an expert for petitioner in *inter partes* reviews of U.S. Patent 8,295,862, relating to enabling short message system (SMS) communication without using IP services. Terminated by settlement. Contact: Robert High, Esq., Finnegan, Henderson, Farabow, Garrett & Dunner, LLP, 271 17th St. N.W., Suite 1400, Atlanta, GA 30363-6209. (R)

248. *Comcast Cable Communications, LLC v. Rovi Guides, Inc.*, IPR2017-01048, IPR2017-01049, IPR2017-01050, Patent Trial and Appeal Board. Served as an expert for patent owner in *inter partes* reviews of U.S. Patent 8,578,413, relating to electronic television program guides. All challenged claims found unpatentable. Contact: Josef B. Schenker, Ropes & Gray LLP, 1211 Avenue of the Americas, New York, NY 10036. (D,R)

249. *Comcast Cable Communications, LLC v. Rovi Guides, Inc.*, IPR2017-01065, IPR2017-01066, IPR2017-01143, Patent Trial and Appeal Board. Served as an expert for patent owner in *inter partes* review of U.S. Patent 8,046,801, relating to electronic television program guides. All challenged claims found unpatentable. Contact: Josef B. Schenker, Ropes & Gray LLP, 1211 Avenue of the Americas, New York, NY 10036. (D,R)

250. *DevFactory FZ-LLC v. Magnitude Software, Inc.*, Arbitration WIPOA300617. Served as an expert for Claimant DevFactory in an arbitration relating to a claim of breach of a software Technology Services Agreement. Arbitration has terminated. Contact: Steve Mitby, Esq., Ahmad, Zavitsanos, Anaipakos, Alavi & Mensing P.C., 1221 McKinney, Suite 2500, Houston, TX 77010.

251. *BookIT Oy Ajanvarauspalvelu v. Bank of America Corporation et al.*, 3:17-cv-02577-K (N.D. Texas). Served as an expert for BookIT in an action alleging infringement of U.S. Patents 8,589,194 and 9,177,268, relating to mediating communications between a service provider and a user in a telecommunications network. Plaintiff sought a judgment of non-infringement so that claim constructions could be appealed to the Federal Circuit, which affirmed. Contact:

Richard A. Kamprath, Esq., McKool Smith, 300 Crescent Court, Suite 1500, Dallas, TX 75201. (D,R)

252. *Promptu Systems Corporation v. Comcast Corporation et al.*, 2:16-cv-06516-JS (E.D. Pa.). Served as an expert for plaintiff in an action alleging infringement of U.S. Patents 7,047, 196, 7,260,538 and RE44,326, relating to voice control of television set-top boxes. Plaintiff is appealing an adverse claim construction. Contact: Robert Yorio, Esq., Carr & Ferrell LLP, 120 Constitution Drive, Menlo Park, CA 94025. (D,R)

253. *Snap Inc. v. Vaporstream, Inc.*, IPR2018-00200, IPR2018-00312, IPR2018-00369, IPR2018-00397, IPR2018-00404, IPR2018-00408, IPR2018-00416, IPR2018-00439, IPR2018-00455, IPR2018-00458, Patent Trial and Appeal Board. Served as an expert for patent owner in *inter partes* reviews of U.S. Patents 8,886,739, 8,935,351, 9,306,885, 9,306,886, 9,313,155, 9,313,156, 9,313,157, 9,338,111 and 9,413,711, relating to reducing traceability of electronic messages. In IPR2018-00312, IPR2018-00369, IPR2018-00404 and IPR2018-00408 and IPR2018-00458, all challenged claims were found unpatentable. In IPR2018-00397, IPR2018-00416, IPR2018-00439 and IPR2018-00455, and IPR2018-00458, all challenged claims were found patentable. Contact: Douglas R. Wilson, Esq., Heim, Payne & Chorush, LLP, Heritage Plaza, 111 Bagby, Suite 2100, Houston, TX 77002. (R)

254. *Shopify, Inc. v. DDR Holdings, LLC*, IPR2018-01008, IPR2018-01009, IPR2018-01010, IPR2018-01011, IPR2018-01012, IPR2018-01014, Patent Trial and Appeal Board. Served as an expert for petitioner in *inter partes* reviews of U.S. Patents 8,515,825, 9,043,228, and 9,639,876, relating to online affiliate marketing. In 2018-01008 and 2018-01009, the PTAB found all challenged claims patentable. In 2018-01010, 2018-01011, 2018-01012 and 2018-01014, the PTAB found most challenged claims unpatentable, affirmed by the Federal Circuit in 2018-01011, 2018-01012 and 2018-01014. Contact: Jinnie L. Reed, Esq., Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C., One Financial Center, Boston. MA 02111. (D,R)

255. *Election Systems & Software, LLC v. Dominion Voting Systems, Inc.*, 1:17-cv-01172-CJB (D. Del.). Served as an expert for plaintiff in a case alleging infringement of U.S. Patent 8,991,701, relating to an accessible voting system. Case has settled. Contact: Robert M. Evans, Jr., Esq., Lewis Rice LLC, 600 Washington Avenue, Suite 2500, St. Louis, MO 63101.

256. *General Motors LLC et al. v. Dorman Products, Inc. et al.*, 2:15-cv-129170-VAR-EAS (E.D. Mich.). Served as an expert for plaintiff in a case alleging copyright infringement and violation of the anti-circumvention provisions of the Digital Millennium Copyright Act relating to offloading of transmission control software from automobiles. Case has settled. Contact: Aaron A. Barlow, Esq., Jenner & Block LLP, 353 North Clark Street, Chicago, IL 60654-3456.

257. *PPS Data, LLC v. Jack Henry & Associates, Inc.*, Case 2:18-cv-00007-JRG (E.D. Texas). Served as an expert for plaintiff in a case alleging infringement of U.S. Patents 7,181,430, 7,216,106, 7,440,924, 7,624,071 and 8,126,809, relating to methods for processing check images in electronic payment systems. The '430, '924, '071 and '809 patent were found invalid by the Court under 35 U.S.C. § 101. After a jury trial, all asserted claims of the '106

patent were found not infringed and invalid. Contact: Anthony H. Son, Esq., Maddox Edwards, PLLC, 1900 K Street NW, Suite 725, Washington, DC 20006. (D,R,T)

258. *NEXT Payment Solutions, Inc. v. CLEAResult Consulting, Inc.*, Case 1:17-cv-08829 (N.D. Illinois). Served as an expert for defendant in a case alleging misappropriation of trade secrets relating to a system for managing energy rebate appointments and inspections. The trade secret counts were dismissed on summary judgment. Contact: Anthony Fuga, Esq., Holland & Knight LLP, 131 S. Dearborn Street, 30th Floor, Chicago, IL 60603. (R)

259. *Certain Digital Video Receivers and Related Hardware and Software Components*, USITC Inv. No. 337-TA-1103. Served as an expert for Complainants Rovi Corporation et al. against Comcast Corporation et al. in an International Trade Commission proceeding involving alleged infringement of U.S. Patents 9,294,799, relating to resumption on a second device of video paused on a first device, and 9,578,363, relating to providing video in a format suitable for a particular device. Those patents were subsequently dropped. Dr. Shamos testified about his observation of user focus groups. The ITC issued an exclusion order, upheld by the Federal Circuit. Contact: Richard A. Kamprath, Esq., McKool Smith, 300 Crescent Court, Suite 1500, Dallas, TX 75201. (D,R,T)

260. *ARM Ltd. et al. v. Complex Memory, LLC*, IPR2019-00053, IPR2019-00058, Patent Trial and Appeal Board. Served as an expert for petitioners in *inter partes* reviews of U.S. Patent 5,890,195, relating to cache memory (SRAM) integrated with main memory (DRAM) and U.S. Patent 6,658,576, relating to an energy-conserving computer operating system. Outcome: both IPRs terminated by settlement. Contact: Kevin Anderson, Esq., Duane Morris LLP, 505 9th Street, NW, Suite 1000, Washington, DC 20004-2166. (R)

261. *Supercell Oy v. Gree, Inc.*, PGR2018-00070, PGR2018-00071, Patent Trial and Appeal Board. Served as an expert for patent owner in post-grant reviews of U.S. Patents 9,770,656 and 9,770,664, relating to user interfaces for multiplayer online games. Institution denied in both PGRs. Contact: Scott McKeown, Esq., Ropes & Gray, L.L.P., 2099 Pennsylvania Avenue, Washington, DC 20006-6807. (R)

262. *Amazon Services, LLC v. South Carolina Dept. of Revenue*, Docket No. 17-ALJ-0238-CC. (S.C. Admin. Ct.). Served as an expert for South Carolina in a tax dispute relating to online sales through Amazon's Merchant Fulfillment Network. Result: Amazon found liable to pay tax. Contact: John Hoefer, Esq., Willoughby & Hoefer, P.A., 940 Richland St., P.O. Box 8416, Columbia, SC 29202-8416. (D)

263. *Supercell Oy v. Gree, Inc.*, PGR2019-00018, Patent Trial and Appeal Board. Served as an expert for patent owner in a post-grant review of U.S. Patent 9,891,799, relating to a method for moving a plurality of objects in a computer game. All claims found unpatentable under 35 U.S.C. § 101. Affirmed by the Federal Circuit. Contact: Scott McKeown, Esq., Ropes & Gray, L.L.P., 2099 Pennsylvania Avenue, Washington, DC 20006-6807. (D,R)

264. *Beal v. Outfield Brew House, LLC.*, Case 2:18-cv-4028 (W.D. Missouri). Served as an expert for plaintiff, representative of a putative class, in a case alleging violation of the

Telephone Consumer Protection Act, 47 U.S.C. § 227, specifically on the issue whether certain dialing systems constitute an "Automatic Telephone Dialing System" under the statute. The District Court ruled for defendant on summary judgment based on statutory interpretation, now on appeal to the Eighth Circuit. Contact: Bill Kenney, Esq., Bill Kenney Law Firm, LLC., 1100 Main St. Suite 1800, Kansas City, MO 64105. (D,R)

265. *Smartmatic USA Corporation v. Election Systems & Software, LLC,* IPR2019-00531, Patent Trial and Appeal Board. Served as an expert for patent owner in an inter partes review of U.S. Patent 8,096,471, relating to a ballot marking device having an attached ballot box and IPR2019-00527 of U.S. Patent 7,753,273. All '471 claims found patentable. Four '273 claims found patentable. Contact: Robert M. Evans, Jr., Esq., Lewis Rice LLC, 600 Washington Avenue, Suite 2500, St. Louis, MO 63101. (D,R)

266. *Curling et al. v. Raffensperger et al.,* Case 1:17-CV-2989AT (N.D. Georgia). Served as an expert for defendants Secretary of State and State Election Board in a case in which plaintiffs seek an injunction of forbid use of DRE voting machines in Georgia in 2019. Preliminary injunction denied as to the November 2019 election. Contact: Vincent Russo, Esq., Robbins Ross Alloy Belinfante Littlefield LLC, 500 14th Street N.W., Atlanta, GA 30318. (D,R)

267. *Smith v. Truman Road Development, LLC d/b/a No OtherPub,* Case 4:18-cv-670-NKL (W.D. Missouri). Served as an expert for plaintiff, representative of a putative class, in a case alleging violation of the Telephone Consumer Protection Act, 47 U.S.C. § 227, specifically on the issue whether certain dialing systems constitute an "Automatic Telephone Dialing System" under the statute. The District Court ruled for defendant on summary judgment based on statutory interpretation. Contact: Bill Kenney, Esq., Bill Kenney Law Firm, LLC., 1100 Main St. Suite 1800, Kansas City, MO 64105. (R)

268. *J. T. Hand et al. v. Beach Entertainment, LLC d/b/a Shark Bar,* Case 4:18-cv-668-NKL (W.D. Missouri). Served as an expert for plaintiff, representative of a putative class, in a case alleging violation of the Telephone Consumer Protection Act, 47 U.S.C. § 227, specifically on the issue whether certain dialing systems constitute an "Automatic Telephone Dialing System" under the statute. Partial summary judgment was granted, now on appeal to the Eighth Circuit. Contact: Bill Kenney, Esq., Bill Kenney Law Firm, LLC., 1100 Main St. Suite 1800, Kansas City, MO 64105. (R)

269. *WhereverTV, Inc. v. Comcast Corporation, et al.,* Case 2:18-cv-00529-UA-CM (M.D. Florida). Served as an expert for plaintiff in a case alleging infringement of U.S. Patent 8,656,431, relating to a system for integrating television and IPTV channels into a global interactive program guide. Contact: Adam Sanderson, Esq., Reese Marketos LLP, 750 N. St. Paul St., Suite 600, Dallas, TX 75201. (R)

270. *Droplets, Inc. v. Nordstrom, Inc.*, Case 3:12-CV-04049-JST (N.D. Cal.). Served as an expert for defendant in an action alleging infringement of U.S. Patent 8,402,115, relating to delivering interactive links for presenting applications on a client computer. Case has settled.

Contact: Benjamin Kleinman, Esq., Kilpatrick Townsend & Stockton LLP, Two Embarcadero Center Suite 1900, San Francisco, CA 94111. (D,R)

271. *Droplets, Inc. v. Yahoo!, Inc.*, Case 3:12-CV-03733-JST (N.D. Cal.). Served as an expert for defendant in an action alleging infringement of U.S. Patent 8,402,115, relating to delivering interactive links for presenting applications on a client computer. At trial, Plaintiff sought $250 million, was awarded $15 million. Contact: Kevin P. Anderson. Esq., Duane Morris LLP, 505 9th Street, N.W., Suite 1000, Washington, DC 20004-2166. (D,R,T)

272. *Square, Inc. v. 4361423 Canada, Inc. d/b/a AnywhereCommerce*, IPR2019-01651, IPR2019-01652, IPR2019-01653, and IPR2019-001654, Patent Trial and Appeal Board. Served as an expert for petitioner in inter-partes reviews of U.S. Patents 9,443,239, 9,613,351, and 9,818,107, relating to an attachment to a cellphone to facilitate credit card transactions. Result: all challenged claims umpatentable in all four IPRs. Contact: David Tennant, Esq., White & Case, L.L.P., 701 Thirteenth Street, NW, Washington, DC 20005. (R)

273. *Uniloc 2017 LLC. v. Netflix, Inc. et al.*, Lead Consolidated Case SACV8:18-cv-2055-GW-DFMx (C.D. Cal.). Served as an expert for plaintiff in a case alleging infringement of U.S. Patents 8,407,609, relating to tracking the amount of time a presentation is watched online, and 9,721,273, relating to aggregating and presenting audio and video over a network. Case has settled. Contact: Sal Lim, Esq., Feinberg Day Kramer Alberti Lim Tonkovich & Belloli LLP, 1600 El Camino Real, Suite 280, Menlo Park, CA 94025. (R)

274. Comcast Cable Communications, LLC v. WhereverTV, Inc., IPR2019-01482, and IPR2019-001483, Patent Trial and Appeal Board. Served as an expert for Patent Owner in inter-partes reviews of U.S. Patent 8,656,431, relating to a system for integrating television and IPTV channels into a global interactive program guide. Institution denied in both cases. Contact: Adam Sanderson, Esq., Reese Marketos LLP, 750 N. St. Paul St., Suite 600, Dallas, TX 75201. (R)

275. Boom! Payments, Inc. v. Stripe, Inc. et al., Case 3:19-cv-0050-VC (N.D. Cal.). Served as an expert for Defendants Shopify, Inc. and Shopify (USA) Inc. in an action alleging infringement of U.S. Patents 8,429,084, and 9,235,857, relating to a system for confirming that a physical exchange of goods has occurred in an online transaction. All asserted claims found invalid under 35 U.S.C. § 101 upon Defendants' motion to dismiss. Contact: Vincent M. Ferraro, Esq., Mintz, Levin, Cohn, Ferris, Glovsky and Popeo P.C., Chrysler Center, 666 Third Avenue, New York, NY 10017.

276. Curb Mobility, LLC. v. Kaptyn, Inc. et al., Case 2:18-cv-02416-MMD-GWF (D. Nev.). Served as an expert for Defendants in an action alleging infringement of U.S. Patent 6,347,739, relating to a system for accepting credit cards in taxicabs. All asserted claims found invalid under 35 U.S.C. § 101. Contact: Robert Yorio, Esq., Carr & Ferrell LLP, 120 Constitution Drive, Menlo Park, CA 94025. (R)

277. Canon, Inc. v. TCL Electronics Holdings, Ltd., et al., Case 2:18-cv-00546-JRG (E.D. Texas). Served as an expert for Plaintiff in an action alleging infringement of U.S. Patent

7,810,130, relating to buffering video content, U.S. Patent 7,746,413, relating to interpreting instructions from a television remote control, and U.S. Patents 8,078,767, 8,346,986 and 8,713,206, relating to controlling a digital display when an external device has been disconnected. Case has settled. Contact: Kyotaro Ozawa, Esq., Paul Hastings LLC, Ark Hills Sengokuyama Mori Tower, Fortieth Floor 1-9-10 Roppongi, Minato-ku, Tokyo 106-0032 Japan. (D,R)

278. *Uniloc 2017 LLC v. Paychex, Inc.*, Case No. 1:19-cv-11272-RGS (D. Mass.), consolidated for certain purposes with *Uniloc 2017 LLC v. AthenaHealth Inc.*, Case No. 1:19-cv-11278-RGS (D. Mass.). Served as an expert for plaintiff in actions alleging infringement of U.S. Patent 6,324,578, relating to management of configurable application programs on a network. Paychex case dismissed for lack of jurisdiction. Cases have settled. Contact: James J. Foster, Esq., Prince Lobel Tye LLP, One International Place, Suite 3700, Boston, MA 02110. (D,R)

279. *H2O Resources, LLC v. Oilfield Tracking Services, LLC*, AAA Case No. 01-18-0003 6309 (Houston, Texas). Served as an expert for defendants in an arbitration alleging misappropriation of trade secrets under 18 U.S.C. § 1836 and 12 P.S. § 5301 (Pennsylvania) relating to a system for tracking movement of produced water generated from oil and gas drilling. Matter has settled. Contact: Paul Greco, Esq., Fisher Philips LLP, 150 N. Radnor Chester Road, Suite C300, Radnor, PA 19087. (D,R)

280. *J.T. Hand et al. v. ARB KC, LLC d/b/a Angels Rocks Bar,* Case 4:19-cv-108-BCW (W.D. Missouri). Served as an expert for plaintiff, representative of a putative class, in a case alleging violation of the Telephone Consumer Protection Act, 47 U.S.C. § 227, specifically on the issue whether certain dialing systems constitute an "Automatic Telephone Dialing System" under the statute. Contact: Bill Kenney, Esq., Bill Kenney Law Firm, LLC., 1100 Main St. Suite 1800, Kansas City, MO 64105. (R)

281. *Doohan et al. v. CTB Investors, LLC d/b/a PBR Big Sky Cowboy Bar et al.*, Case 4:19-cv-111-FJG (W.D. Missouri). Served as an expert for plaintiff, representative of a putative class, in a case alleging violation of the Telephone Consumer Protection Act, 47 U.S.C. § 227, specifically on the issue whether certain dialing systems constitute an "Automatic Telephone Dialing System" under the statute. Contact: Bill Kenney, Esq., Bill Kenney Law Firm, LLC., 1100 Main St. Suite 1800, Kansas City, MO 64105. (R)

282. *Taylor et al. v. KC Vin, LLC d/b/a/ Pizza Bar, et al.*, Case 4:19-cv-110-NKL (W.D. Missouri). Served as an expert for plaintiff, representative of a putative class, in a case alleging violation of the Telephone Consumer Protection Act, 47 U.S.C. § 227, specifically on the issue whether certain dialing systems constitute an "Automatic Telephone Dialing System" under the statute. Contact: Bill Kenney, Esq., Bill Kenney Law Firm, LLC., 1100 Main St. Suite 1800, Kansas City, MO 64105. (R)

283. *The Thomas L. Pearson and The Pearson Family Members Foundation, et al. v. The University of Chicago,* Case 4:18-cv-00099-GKF-FHM (N.D. Oklahoma). Served as an expert for plaintiffs in an action alleging breach of an agreement granting $100 million to the

University of Chicago. Case has settled. Contact: P. Scott Hathaway, Esq., Conner & Winters, LLP, 4000 One Williams Center, Tulsa, OK 74172-0148. (D,R)

284. *ESW Holdings, Inc. v. Roku, Inc.*, Case 6:19-cv-00044-ADA (W.D. Texas). Served as an expert for Plaintiff in an action alleging infringement of U.S. Patent 9,420,349, relating to monitoring a digital media stream and identifying media objects through fingerprinting. Jury verdict for defendent. Contact: Conor Civins, Esq., Bracewell LLP, 111 Congress Avenue, Suite 2300, Austin, TX 78701-4061 (D,R,T)

285. *Apple, Inc. v. Fintiv, Inc.*, IPR2020-00019, Patent Trial and Appeal Board. Served as an expert for Patent Owner in an inter-partes review of U.S. Patent 8,843,125, relating to a system and method for managing a mobile wallet through a Trusted Service Manager (TSM). Institution denied. Contact: Marcus Barber, Esq., Kasowitz Benson Torres LLP, 333 Twin Dolphin Drive, Suite 200, Redwood Shores, CA 94065. (D, R)

286. *Election Systems & Software, LLC v. Hart InterCivic, Inc.*, PGR2020-00031, Patent Trial and Appeal Board. Served as an expert for petitioner in a post-grant review of U.S. Patent 10,445,966, relating to conversion of printed ballots into cast vote records by optical character recognition. Result: all challenged claims unpatentable. Federal Circuit appeal was dismissed by Patent Owner. Contact: Robert M. Evans, Jr., Esq., Lewis Rice LLC, 600 Washington Avenue, Suite 2500, St. Louis, MO 63101. (D,R)

287. *Launius v. Flores, in her official capacity as Presiding Officer, Chair of Trustees, of Dallas County Community College District*, Cause DC-19-08429 (Dist. Ct., Dallas Cty., Texas). Served as an expert for contestee in an action alleging that an election held May 4, 2019 approving a $1 billion bond issue should be overturned because "the true outcome of the election cannot be ascertained." After a bench trial, the Court granted judgment in favor of contestee. Affirdmed by the Court of Appeals. The Texas Supreme Court declined review. Contact: Adam Rothey, Esq., Thompson & Horton LLP, 500 N. Akard St., Suite 3150, Dallas, TX 75201. (D,T)

288. *Slyce Acquisition, Inc. v. Syte - Visual Conception Ltd. et al.*, Case 6:19-cv-00257-ADA (W.D. Texas). Served as an expert for Plaintiff in an action alleging infringement of U.S. Patent 9,152,624, relating to navigating Web content via image analysis. Case has settled. Contact: Michael Chibib, Esq., Bracewell LLP, 111 Congress Avenue, Suite 2300, Austin, TX 78701-4061 (R)

289. *Early Warning Services, LLC v. William Grecia*, IPR2020-00763, Patent Trial and Appeal Board. Served as an expert for petitioner in an inter partes review of U.S. Patent 8,887,308, relating to generation of tokens authenticating users seeking access to digital cloud content. Review was not instituted, but the patent was found invalid on § 101 grounds in litigation. Contact: Cory Smith, Esq., Bryan Cave Leighton Paisner LLP, Two North Central Avenue, Suite 2100, Phoenix, AZ 85004-4406. (R)

290. *Supercell Oy v. Gree, Inc.*, PGR2020-00063, Patent Trial and Appeal Board. Served as an expert for patent owner in a post-grant review of U.S. Patent 10,406,432, relating to a method for providing information in a head-mounted display based on gaze sensing. Institution

denied. Contact: Scott McKeown, Esq., Ropes & Gray, L.L.P., 2099 Pennsylvania Avenue, Washington, DC 20006-6807. (R)

291. *Digital Retail Apps, Inc. v. H-E-B Grocery Company, LP*, Case 6:19-cv-00167-ADA (W.D. Texas). Served as an expert for defendant in an action alleging infringement of U.S. Patents 9,262,781, and 9,934,506, relating to use of QR codes in point-of-sale electronic payment applications. Case settled before trial. Contact: Andrew Klein, Esq., Perkins Coie LLP, 3150 Porter Drive, Palo Alto, CA 94304-1212. (D,R)

292. *HLFIP Holding, Inc. d/b/a/ Smart Communications IP Holdings v. Rutherford County, Tennessee et al.*, Case 3:19-cv-00714 (M.D. Tenn.). Served as an expert for intervenor VendEngine, Inc. in an action alleging infringement of U.S. Patent 10,291,617, relating to a computerized method of eliminating contraband in mail directed to correctional facilities. Defendant and intervenor prevailed on judgment on the pleadings that the patent was ineligible under 35 U.S.C. § 101. Contact: W. Edward Ramage, Esq., Baker Donelson, Bearman, Caldwell & Berkowitz, P.C., Monarch Plaza, Suite 1600, 3414 Peachtree Road N.E., Atlanta, GA 30326. (D,R)

294. *Broadband iTV, Inc. v. DISH Network, L.L.C.*, Case 6:19-cv-716-ADA (W.D. Texas). Served as an expert for Plaintiff in an action alleging infringement of U.S. Patents 9,648,388, 9,998,791, 10,028,026 and 10,506.269, relating to hierarchical navigation of video-on-demand television menus. Case has settled. Contact: Sal Lim, Esq., Kramer Day Alberti Lim Tonkovich & Belloli LLP, 577 Airport Boulevard, Suite 250, Burlingame, California 94010. (D,R)

295. *Arendi S.A.R.L. v. Blackberry Limited et al.*, Case 1:12-cv-01595-LPS (D. Del.). Serving as an expert for Defendant in an action alleging infringement of U.S. Patents 7,917,843 and 8,306,993, relating to a touchscreen mechanism for providing name and address handling by an associated information system. Contact: Jason W. Cook, Esq., McGuireWoods LLP, 2000 McKinney Ave., Suite 1400, Dallas, TX 75201. (D,R)

296. *Unified Patents, LLC v. Monarch Networking Solutions LLC*, IPR2020-01708, Patent Trial and Appeal Board. Served as an expert for petitioner in an inter partes review of U.S. Patent 7,756,507, relating to out-of-band authentication to obtain access to a digital network. All challenged claims found unpatentable. Contact: John M. Baird, Esq., Duane Morris LLP, 505 9th Street, N.W., Suite 1000, Washington, DC 20004-2166. (R)

297. *Aqua Connect, Inc. et al. v. TeamViewer U.S. Inc. et al.*, Case 1:18-cv-01572-MN (D. Del.). Served as an expert for Plaintiffs in an action alleging infringement of U.S. Patents RE46,386 and 8,924,502, relating to updating a user session in a Mach-derived system environment. At trial, the jury awarded Plaintiffs $5.7 million, before prejudgment interest. Contact: Ryan E. Hatch, Esq., Hatch Law, P.C., 13323 Washington Blvd., Suite 100, Los Angeles, CA 90066. (D,R,T)

298. *PayPal, Inc. v. RetailMeNot, Inc.*, Case 6:20-cv-00339-ADA (W.D. Texas). Served as an expert for PayPal in an action alleging infringement by RetailMeNot of U.S. Patents 6,917,961 and 7,693,937, relating to evolving interactive browser dialog boxes, U.S. Patent 7,659,905,

relating to pre-fetching data on a network, U.S. Patents 8,909,248 and 9,654,923, relating to provision of location-based services, and U.S. Patents 9,053,514 and 9,082,153, relating to automatic rebate and coupon redemption, and alleging in counterclaims infringement by PayPal of U.S. Patents 10,296,931, and 10,489,814, relating to accessing promotional offers displayed on websites by circumventing secure sandbox protections. Case has settled. Contact: Steve Marshall, Esq., Fish & Richardson, P.C., 1000 Maine Avenue, S.W., Suite 1000, Washington, DC 20024.

299. *Rovi Guides, Inc. et al. v. Comcast Corporation et al.*, Case No. 2:18-cv-00253-AG-FFM (C.D. Cal.). Served as an expert for plaintiffs in an action alleging infringement of U.S. Patents 7,827,585, relating to electronic TV program guides, 9,294,799, relating to an on-demand media delivery system, 9,369,741, relating to an interactive television reminder system, 9,578,363, relating to accessing video content via standard and high-definition channels, 9,621,956, relating to a television transport control interface, and 9,668,014, relating to methods for storing video assets. Case has settled. Contact: Richard A. Kamprath, Esq., McKool Smith, 300 Crescent Court, Suite 1500, Dallas, TX 75201.

300. *RetailMeNot, Inc. v. Honey Science, LLC,* Case 1:18-cv-00937-CFC-MPT (D. Del.). Served as an expert for defendant in an action alleging infringement of U.S. Patents 9,626,688, 10,290,015, 10,296,931, and 10,489,814, relating to accessing promotional offers displayed on websites by circumventing secure sandbox protections. Case has settled. Contact: Richard Birnholz, Esq., Irell & Manella LLP, 1800 Avenue of the Stars, Suite 900, Los Angeles, CA 90067-4276.

301. *Certain Video Processing Devices, Components Thereof, and Digital Smart Televisions Containing the Same*, USITC Inv. No. 337-TA-1222. Served as an expert for Complainant DivX, LLC against numerous smart television manufacturers in an International Trade Commission proceeding involving alleged infringement of, *inter alia*, U.S. Patent 8,832,297, relating to multiphase adaptive bitrate streaming. Case has settled. Contact: Jessica Perry, Esq., Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C., One Financial Center, Boston, MA 02111.

302. *Google LLC v. Sonos, Inc.*, Case No. 3:20-cv-03845-EMC (N.D. Cal.). Served as an expert for Google in an action alleging infringement of U.S. Patent 7,065,206, relating to echo and noise control, 7,899,187, relating to digital rights management, 8,583,489, relating to notification of availability of media content, 10,140,375, relating to personalized network searching, and 10,229,586, relating to communication via wireless sensor systems. Result: all claims dismissed on summary judgment. Contact: Patrick D. Curran Esq., Quinn Emanuel Urquhart & Sullivan LLP, 111 Huntington Avenue, Suite 520, Boston, MA 02199. (R)

303. *Hitel Technologies LLC v. Nike, Inc.*, Case 6:20-cv-00591-ADA (W.D. Texas). Served as an expert for Nike in an action alleging infringement of U.S. Patent 7,689,617, relating to adaptive learning during Web navigation. Case was dropped by plaintiff during claim construction. Contact: Christopher Renk, Esq., Arnold & Porter Kaye Scholer LLP, 70 West Madison Street, Suite 4200, Chicago, IL 60602-4231.

304. *Hitel Technologies LLC v. Levi Strauss & Co.*, Case 6:20-cv-00589-ADA (W.D. Texas). Served as an expert for Levi Strauss in an action alleging infringement of U.S. Patent 7,689,617, relating to adaptive learning during Web navigation. Case was dropped by plaintiff during claim construction. Contact: Robert A. McFarlane, Esq., Hanson Bridgett LLP, 425 Market Street, 26th Floor, San Francisco, CA 94105.

305. *Unified Patents, LLC v. Caselas, LLC,* IPR2021-00799, Patent Trial and Appeal Board. Served as an expert for petitioner in an inter partes review of U.S. Patent 9,715,691, relating to providing information about charge-backs in credit reports. Result: all challenged claims found unpatentable. See Final Written Decision. Contact: Larissa Bifano, Esq., DLA Piper LLP, 33 Arch Street, 26th Floor, Boston, MA 02110-1447. (D,R)

306. *Fortinet, Inc. v. Forescout Technologies, Inc.*, Case 3:20-cv-03343-EMC-ADA (N.D. Cal.). Served as an expert for plaintiff in an action alleging infringement of U.S. Patents 8,458,314, relating to administration of network security privileges, 9,369,299, relating to methods for controlling remote network access, 9,503,421, relating to security information and event management, 9,894,034, relating to configuration of network endpoint security, and 9,948,662, relating to application layer network security. Case has settled. Contact: Rachel Blitzer, Esq., Skadden, Arps, Slate, Meagher & Flom LLP, One Manhattan West, New York, NY 10001. (R)

307. *Delaware North iGaming, Inc. v. Miomni Gaming Ltd. et al.*, C.A. 2019-0301-JTL (Del. Ch.). Served as a court-appointed expert in a matter alleging breach of contract to provide software and computing services. Case has settled. Contact: Vice-Chancellor J. Travis Laster, Court of Chancery, 500 North King Street, Wilmington, DE 19801.

308. *Zillow Group et al. v. International Business Machines Corp.*, IPR2020-01656, Patent Trial and Appeal Board. Served as an expert for patent owner in an *inter partes* review of U.S. Patent 8,315,904, relating to a computerized method for managing promotions. Review was instituted, but all Challenged Claims were found patentable. Contact: Gautam Patnaik, Esq., Desmarais, LLP, 1701 Pennsylvania Avenue NW, Suite 200, Washington, D.C. 20006. (D,R)

309. *ByteDance Ltd. and TikTok Inc. v. Triller, Inc.*, IPR2021-00099, Patent Trial and Appeal Board. Served as an expert for patent owner in an *inter partes* review of U.S. Patent 9,691,429, relating to systems and methods for creating music videos synchronized with an audio track. Case has settled. Contact: Brent Lorimer, Esq., Workman Nydegger, 60 East South Temple, Suite 1000, Salt Lake City, UT 84111. (D,R)

310. *Broadband iTV, Inc. v. Amazon.Com, Inc. et al.*, Case 6:20-cv-921-ADA (W.D. Texas). Served as an expert for Plaintiff in an action alleging infringement of U.S. Patents 9,648,388, 9,973,826, 10,028,026, 10,506,269, 10,536,750 and 10,536,751, relating to hierarchical navigation of video-on-demand television menus. Asserted claims found invalid as non-statutory, affirmed by the Federal Circuit. Contact: Sal Lim, Esq., Kramer Day Alberti Lim Tonkovich & Belloli LLP, 577 Airport Boulevard, Suite 250, Burlingame, California 94010. (D,R)

311. *DISH Network, L.L.C, v. Broadband iTV, Inc.*, IPR2020-01267, Patent Trial and Appeal Board. Served as an expert for patent owner in in an *inter partes* review of U.S. Patent 10,028,026, relating to hierarchical navigation of video-on-demand television menus. Case has settled. Contact: Sal Lim, Esq., Kramer Day Alberti Lim Tonkovich & Belloli LLP, 577 Airport Boulevard, Suite 250, Burlingame, California 94010. (D,R)

312. *DISH Network, L.L.C, v. Broadband iTV, Inc.*, IPR2020-01280, Patent Trial and Appeal Board. Served as an expert for patent owner in in an *inter partes* review of U.S. Patent 9,998,791, relating to hierarchical navigation of video-on-demand television menus. Case has settled. Contact: Sal Lim, Esq., Kramer Day Alberti Lim Tonkovich & Belloli LLP, 577 Airport Boulevard, Suite 250, Burlingame, California 94010. (D,R)

313. *DISH Network, L.L.C, v. Broadband iTV, Inc.*, IPR2020-01359, Patent Trial and Appeal Board. Served as an expert for patent owner in in an *inter partes* review of U.S. Patent 9,648,388, relating to hierarchical navigation of video-on-demand television menus. Case has settled. Contact: Sal Lim, Esq., Kramer Day Alberti Lim Tonkovich & Belloli LLP, 577 Airport Boulevard, Suite 250, Burlingame, California 94010. (D,R)

314. *Justservice.net, LLC. v. Dropbox, Inc.*, Case 6:20-cv-00070-ADA (W.D. Texas). Served as an expert for Defendants in an action alleging infringement of U.S. Patents 8,126,990, 8,195,776, 8,392,542, 9,722,993, 10,387,270 and 10,476,868, relating to network-based file backup systems. Case has settled. Contact: Monica Grewal, Esq., Wilmer Cutler Pickering Hale and Dorr LLP, 60 State Street, Boston, MA 02109.

315. *Dropbox, Inc. v. Motion Offense, LLP*, Case 6:20-cv-00251-ADA (W.D. Texas). Served as an expert for declaratory judgment plaintiff Dropbox in an action relating to alleged infringement of U.S. Patents 10,013,158, 10,021,052, 10,303,353, 10,587,548, and 10,613,737, relating to file-sharing systems. At trial, all asserted claims were found not infringed, not entitled to priority to 2012, and were found invalid. Contact: Monica Grewal, Esq., Wilmer Cutler Pickering Hale and Dorr LLP, 60 State Street, Boston, MA 02109. (D,R,T)

316. *HealthPlanCRM, LLC d/b/a Cavulus v. AvMed, Inc. et al.*, Case 01-19-0002-2557 (American Arbitration Association). Served as an expert for respondents in an arbitration alleging misappropriation of trade secrets concerning a customer relationship management (CRM) platform relating to Medicare Advantage Plans. Result: all claims dismissed by arbitrator. Contact: Chris Schwing, Esq., Holland & Knight LLP, 50 N. Laura Street, Suite 3900, Jacksonville, FL 32202. (R)

317. *Talavera et al. v. Global Payments, Inc. et al.*, Case 3:21-cv-1585-TWR-AGS (S.D. Cal.). Served as an expert for defendants in an action alleging infringement of copyright in a computer program that operates storefronts for online purchase of school supplies. Contact: Matthew D. Murphey, Esq., Murphey & Murphey, 120 Vantis Drive, Suite 300, Aliso Viejo, California 92656. (R)

318. *AlphaSense Oy et al. v. Sentieo, Inc.*, Case 1:21-cv-01011-CFC/JLH-MPT (D. Del.). Served as an expert for defendant in a case alleging infringement of U.S. Patent 11,023,675, relating to a

user interface for a financial document search engine. Case has settled. Contact: Jennifer Ying, Esq., Morris, Nichols, Arsht & Tunnell, LLP, 1201 North Market Street, 16th Floor, Wilmington, DE 19899-1347. (R)

319. *Triller, Inc. v. TikTok PTE, Ltd.*, IPR2022-00179, IPR2021-00180, and IPR2021-00181, Patent Trial and Appeal Board. Served as an expert for petitioner in *inter partes* reviews of U.S. Patents 9,294,430, 9,648,132, and 9,992,232, relating to systems and methods for locating and downloading digital music to a wireless device. Review was instituted in 2022-00179 and 2022-00180; denied in 2022-00181. Case has settled. Contact: Brent Lorimer, Esq., Workman Nydegger, 60 East South Temple, Suites 1000, Salt Lake City, UT 84111. (D,R)

320. *RFCyber Corp. v. Google LLC and Google Payment Corp.*, C.A. 2:20-cv-00274-JRG (E.D. Texas). Served as an expert for Google in an action alleging infringement of U.S. Patents 6,292,657, 8,118,218, 8,448,855, 9,189,787, 9,240,009, and 10,600,046, relating to electronic commerce payment methods. Case has settled. Contact: Heather Takahashi, Esq., Munger, Tolles & Olson LLP, 355 South Grand Avenue, Los Angeles, CA 90071.

321. *KioSoft Technologies, LLC et al. v. PayRange, Inc.*, PGR2021-00077, Patent Trial and Appeal Board. Served as an expert for patent owner in a post-grant review of U.S. Patent 10,719,833, relating to methods for authorizing payments wirelessly at vending machines. Result: claim 1 unpatentable; claims 2-27 not unpatentable. Contact: Matthew Argenti, Esq., Wilson Sonsini Goodrich & Rosati, 650 Page Mill Road, Palo Alto, CA 94304. (D,R)

322. *Fintiv, Inc. v. Apple, Inc.* C.A. 1:21-cv-00896-ADA (W.D. Texas). Serving as an expert for plaintiff in an action alleging infringement of U.S. Patent 8,843,125, relating to a system and method for managing a mobile wallet through a Trusted Service Manager (TSM). Defendant obtained summary judgment of non-infringement, reverse and remanded by the Federal Circuit. Contact: Marcus Barber, Esq., Kasowitz Benson Torres LLP, 333 Twin Dolphin Drive, Suite 200, Redwood Shores, CA 94065. (D, R)

323. *NRT Technology Corp. et al. v. Everi Holdings Inc. et al.*, C.A. 1:19-cv-00804-MN (D. Del.). Serving as an expert for Plaintiffs in an action alleging misuse of U.S. Patent 6,081,792, relating to structuring ATM and POS transactions with respect to withdrawal limits. Contact: Colby B. Springer, Esq., Polsinelli LLP (formerly at Lewis Roca Rothgerber LLP), Three Embarcadero Center, Suite 1350, San Francisco, CA 94111. (D,R)

324. *KioSoft Technologies, LLC et al. v. PayRange, Inc.*, PGR2021-00093, Patent Trial and Appeal Board. Served as an expert for patent owner in a post-grant review of U.S. Patent 10,891,614, relating to methods for authorizing payments wirelessly at vending machines. Claims 7, 11-13, 16 and 17 found not unpatentable. Contact: Matthew Argenti, Esq., Wilson Sonsini Goodrich & Rosati, 650 Page Mill Road, Palo Alto, CA 94304. (D,R)

325. *OANDA Corporation v. GAIN Capital Holdings Inc. et al.*, C.A. 3:20-cv-05784-ZNQ-DEA (D. N.J.). Serving as an expert for Plaintiff in an action alleging infringement of U.S. Patents

7,146,336 and 8,392,311, relating to systems and methods of online currency trading. Contact: Drew Koning, Esq., Koning Zolar LLP 169 Saxony Road, Suite 115, Encitas, CA 92024-6780. (R)

326. *AnywhereCommerce, Inc. et al. v. Ingenico, Inc. et al.*, C.A. 1:19-cv-11457-IT (D. Mass.). Served as an expert for Defendants in an action alleging infringement misappropriation of trade secrets involving card reading devices connecting to cellphones via audio jack. Result: verdict for Defendants. Contact: Jeffrey Techentin, Esq., Adler Pollock & Sheehan P.C., One Citizens Plaza, 8th Floor, Providence, RI 02903-1345. (D,R,T)

327. *Samsung Electronics Co. Ltd. v. Aire Technology Ltd,*, IPR2022-00875, Patent Trial and Appeal Board. Served as an expert for petitioner in an *inter partes* review of U.S. Patent 8,205,249, relating to a method for carrying out a secure electronic transaction. Terminated by settlement prior to institution. Contact: Daniel Tishman, Esq., Fish & Richardson, P.C., 1000 Maine Avenue, S.W., Suite 1000, Washington, DC 20024. (R)

328. *Content Square SAS v. Quantum Metric, Inc.*, IPR2022-01167, Patent Trial and Appeal Board. Served as an expert for petitioner in an *inter partes* review of U.S. Patent 11,036,823, relating to a method for capturing and replaying user interactions with a webpage through a Document Object Model (DOM) tree. Terminated by settlement. Contact: Stephen R. Smith, Esq., Cooley LLP, 1299 Pennsylvania Avenue, NW, Suite 700, Washington, DC 20004-2400. (R)

329. *Open Text Corporation et al. v. SAS C6,* C.A. 2084-cv-02578-BLS1 (Mass. Super.). Served as an expert for Defendant in an action alleging breach of a software license agreement and misappropriation of trade secrets involving enterprise content management systems. Case has settled. Contact: Matthew C. Hurley, Esq., Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C., One Financial Center, Boston, MA 02111. (R)

330. *ABG Intermediate Holdings 2, LLC at al. v. Bolt Financial, Inc.*, C.A. 22-cv-00473-IT (S.D. N.Y.). Served as an expert for Plaintiff in a case alleging breach of contract for development of an ecommerce software platform and misuse of proprietary information. Case has settled. Contact: Bill Natbony, Esq., Cadwalader, Wickersham & Taft LLP, 200 Liberty Street, New York, NY 10281.

331. *In the Matter of Certain Digital Set-Top Boxes and Systems and Services Including the Same,* USITC Inv. No. 337-TA-1315. Served as an expert for Complainant Broadband iTV, Inc. in an ITC proceeding alleging infringement of U.S. Patents 9,866,909, 9,936,240, 10,555,014, and 11,277,669, relating to hierarchical navigation of video-on-demand television menus. Case has settled. Contact: Sal Lim, Esq., Kramer Day Alberti Lim Tonkovich & Belloli LLP, 577 Airport Boulevard, Suite 250, Burlingame, California 94010. (R)

332. *Proofpoint, Inc. et al. v. Vade Secure Incorporated et al.*, Case 3:19-cv-04238-MMC (N.D. Cal.). Served as an expert for plaintiffs in an action alleging misappropriation of trade secrets and breach of employment and confidentiality agreements relating to cybersecurity technology.

Result: jury verdict for plaintiffs for $13.9 million. Contact: Sean Pak, Esq., Quinn Emanuel Urquhart & Sullivan, LLP, 50 California Street, 22nd Floor San Francisco, California 94111.

333. *Apple, Inc. v. Fintiv, Inc.*, IPR2022-00976, Patent Trial and Appeal Board. Served as an expert for Patent Owner in an inter-partes review of U.S. Patent 9,892,386, relating to a mobile financial services system for making payments using mobile wallets. All challenged claims found unpatentable, now on appeal to the Federal Circuit. Contact: Marcus Barber, Esq., Kasowitz Benson Torres LLP, 333 Twin Dolphin Drive, Suite 200, Redwood Shores, CA 94065. (D,R)

334. *BJ's Wholesale Club Holdings, Inc. v. Walmart Apollo, LLC.*, IPR2022-01471, Patent Trial and Appeal Board. Served as an expert for Petitioner in an inter-partes review of U.S. Patent 10,121,133, relating to a method for retail self-checkout using a mobile device. Institution was denied. Contact: Michael Messinger, Esq., Vorys, Sater, Seymour and Pease LLP, 1909 K Street NW, Suite 900, Washington, DC 20006-1152. (D,R)

335. *KioSoft Technologies, LLC et al. v. PayRange, Inc.*, PGR2021-00084, Patent Trial and Appeal Board. Served as an expert for patent owner in a post-grant review of U.S. Patent 10,891,608, relating to methods for authorizing payments wirelessly at vending machines. Review was not instituted. Contact: Matthew Argenti, Esq., Wilson Sonsini Goodrich & Rosati, 650 Page Mill Road, Palo Alto, CA 94304.

336. *Versata Software, Inc., et al. v. Configit A/S*, Case 2:20-cv-09019-JAK-MRW (C.D. Cal.). Served as an expert for Plaintiff in an action alleging trade secret misappropriation and infringement of U.S. Patents 6,836,766 and 10,360,612, relating to product configuration systems. Case has settled. Contact: Michael Chibib, Esq., Bracewell LLP, 111 Congress Avenue, Suite 2300, Austin, TX 78701-4061 (R)

337. *Apple, Inc. v. Mozido-Corfire-Korea, Ltd.*, IPR2022-01149, Patent Trial and Appeal Board. Served as an expert for real party in interest Fintiv, Inc. in an inter-partes review of U.S. Patent 10,223,692, relating to a method for establishing temporary payment cards on a mobile device. All challenged claims found unpatentable. Contact: Marcus Barber, Esq., Kasowitz Benson Torres LLP, 333 Twin Dolphin Drive, Suite 200, Redwood Shores, CA 94065. (D,R)

338. *Apple, Inc. v. Mozido, Inc.*, IPR2022-01150, Patent Trial and Appeal Board. Served as an expert for real party in interest Fintiv, Inc. in an inter-partes review of U.S. Patent 9,189,785, relating to a method for selecting a debit network using a scannable code. Some challenged claims found unpatentable. Claims 5, 12, and 19 found patentable. Contact: Marcus Barber, Esq., Kasowitz Benson Torres LLP, 333 Twin Dolphin Drive, Suite 200, Redwood Shores, CA 94065. (D,R)

339. *In re Xyrem (Sodium Oxybate) Antitrust Litigation*, Case 5:20-md-02966-RS (N.D. Cal.). Deposed as a fact witnesss concerning expert reports submitted in case 149, *Jazz Pharmaceuticals, Inc. v. Roxane Laboratories, Inc.*, regarding methods for controlling the distribution of sensitive drugs. Contact: Jack E. Pace III, Esq., White & Case LLP, 1221 Avenue of the Americas, New York, NY 10020 (D)

340. *Roku, Inc. v. IOENGINE, LLC,* IPR2022-01257, IPR2022-01258, Patent Trial and Appeal Board. Served as an expert for Patent Owner in inter-partes reviews of U.S. Patent 10,447,819, relating to a secure portable device implementing a plug-n-play VPN. Institution denied in both IPRs. Contact: Greg Chuebon, Esq., Dechert LLP, Three Bryant Park, 1095 Avenue of the Americas, New York, NY 10036-6797. (D,R)

341. *Beijing Meishe Network Technology Co., Ltd. v. TikTok Inc.*, C.A. 6:21-cv-00504-ADA-JCM (W.D. Texas). Serving as an expert for plaintiff in an action alleging copyright infringement and trade secret misappropriation of software for editing video and audio on mobile devices. Contact: Stephanie Wood, Esq., Cherian LLP, 8350 N. Central Expressway, Suite 1900, Dallas, TX 75206.

342. *Ivanti, Inc. v. Patch My PC, LLC,* C.A. 1:22-cv-00643-NYW-SKC (D. Col.). Served as an expert for defendant in an action alleging infringement of U.S. Patents 6,990,660, 7,823,147 and 8,407,687, relating to methods for updating software remotely over a network by using patch fingerprints. On summary judgment, all asserted claims were found paten-ineligible under 35 U.S.C. § 101. Contact: Daniel W. McDonald, Esq., Merchant & Gould P.C., Suite 220, 150 S. Fifth St., Minneapolis MN 55402. (D,R)

343. *Samsung Electronics, Co. Ltd. v. Cardware, Inc.*, IPR2023-00196, IPR2023-00210, IPR2023-00211, and IPR2023-00219, Patent Trial and Appeal Board. Served as an expert for Petitioner in inter-partes reviews of U.S. Patents 10,810,579 (IPR 196), 10,339,520 (IPRs 210, 211), and 11,176,538 (IPR 219), relating to a device for simulating a magnetic-stripe credit card. Institution was denied in IPR2023-00210; the remainder settled. Contact: Nicholas Stevens, Esq., Fish & Richardson, 60 South Sixth Street, Suite 3200, Minneapolis, MN 55402. (D,R)

344. *Snap, Inc. v. YouMap, Inc.*, IPR2022-00568, Patent Trial and Appeal Board. Served as an expert for Patent Owner in an inter-partes review of U.S. Patent 10,616,727, relating to providing location information associated with social network posts. Result: 16 substitute claims found patentable. Contact: Richard A. Catalina, Esq., Jardim, Meisner & Susser, P.C., 766 Shrewsbury Ave., Suite E-202, Tinton Falls, NJ 07724. (D,R)

345. *Everi Payments, Inc. v. Sightline Payments LLC,* IPR2022-00614, IPR2022-00663, and, IPR2022-00696, Patent Trial and Appeal Board. Served as an expert for Patent Owner in inter-partes reviews of U.S. Patents 8,708,809 (IPR 614), 8,998,708 (IPR 663), 9,196,123 (IPR 696), 9,466,176 (IPR 706), and 9,785,926 (IPR 707), relating to systems for funding casino gaming accounts also usable for non-gaming purposes. All challenged claims found unpatentable. Contact: James Murphy, Esq., Polsinelli LLP, 1000 Louisiana Street, 64 Fl, Houston, TX 77002. (D,R)

346. *SurgeTech, LLC v. Uber Technologies, Inc.*, C.A. 1:22-cv-00882-GBW-CJB (D. Del.). Served as an expert for plaintiff in an action alleging infringement of U.S. Patents 11,334,598, 11,360,999 and 11,475,047, relating to methods for allocating and pricing transportation services based on supply, demand and performance factors. The asserted claims were found patent-ineligible on a motion of judgment on the pleadings, now on appeal to the Federal

Circuit. Contact: James Glass, Esq., Quinn Emanuel Urquhart & Sullivan LLP, 51 Madison Avenue, 22nd Floor, New York, New York 10010.

347. *Samsung Electronics, Co. Ltd. v. Cardware, Inc.*, IPR2023-00314, Patent Trial and Appeal Board. Served as an expert for Petitioner in an inter-partes review of U.S. Patent 10,628,820, relating to a device for simulating a magnetic-stripe credit card. Case has settled. Contact: Nicholas Stevens, Esq., Fish & Richardson, 60 South Sixth Street, Suite 3200, Minneapolis, MN 55402. (R)

348. *Election Systems & Software, LLC v. Smartmatic USA Corporation*, 1:18-cv-01259-UNA (D. Del.). Served as an expert for plaintiff in a case alleging infringement of U.S. Patent 8,096,471, relating to a ballot marking device having an attached ballot box. The asserted claims were found ineligible under 35 U.S.C. § 101. Affirmed by the Federal Circuit. Contact: Robert M. Evans, Jr., Esq., Lewis Rice LLC, 600 Washington Avenue, Suite 2500, St. Louis, MO 63101. (D,R)

349. *Textile Computer Systems, Inc. v. Broadway National Bank et al.*, 6:21-cv-00150-ADA (W.D. Tex.). Served as an expert for defendants in cases (including 6:21-cv-00152, 6:21-cv-00154, 6:21-cv-00156 and 6:21-cv-00157) alleging infringement of U.S. Patents 8,505,079, 8,533,802, 9,584,499, 10,148,659, and 10,560,454 relating to online authentication methods. Case has settled. Contact: Jeffrey D. Blake, Esq., Merchant & Gould, 191 Peachtree Street NE, Suite 3800, Atlanta, GA 30303.

350. *Kroy IP Holdings, LLC v. Groupon, Inc.*, 1:17-cv-01405-MN (D. Del.). Served as an expert for defendant in a case alleging infringement of U.S. Patent 6,061,660, relating to online incentive and award fulfillment methods. All claims found invalid on a motion to dismiss alleging collateral estoppel based on prior IPRs. Reverse and remanded by the Federak Circuit in February 2025 in 2023-1359. Contact: Ryan Phelan, Esq., Marshall, Gerstein & Borun, LLP, 233 South Wacker Drive, 300 Willis Tower, Chicago, IL 60606-6357.

351. *Underwood v. IFA Holdings, LLC dba Cygnal*, 1:21-cv-00830-ACA (N.D. Ala.). Served as an expert for defendant in a case alleging violations of the Telephone Consumer Protection Act (TCPA), 47 U.S.C. § 227. Case has settled. Contact: Stephen J. Baumgarner, Esq., Maynard Cooper & Gale LLP, 1901 Sixth Ave. North, Suite 1700, Birmingham, AL 35203.

352. *BJ's Wholesale Club Holdings, Inc. v. Walmart Apollo, LLC.*, IPR2022-01528, -01561, -01563, -01564, Patent Trial and Appeal Board. Served as an expert for Petitioner in an inter-partes reviews of U.S. Patent 10,803,435, relating to a method for retail self-checkout using a mobile device. Institution was denied in 1561. In 1528, 1563, and 1564, all challenged claims were found unpatentable. Contact: Michael Messinger, Esq., Vorys, Sater, Seymour and Pease LLP, 1909 K Street NW, Suite 900, Washington, DC 20006-1152. (D,R)

353. *Samsung Electronics, Co. Ltd. v. Cardware, Inc.*, PGR2023-00012, PGR2023-00013, Patent Trial and Appeal Board. Served as an expert for Petitioner in post-grant reviews of U.S. Patent 11,328,286, relating to a device for simulating a magnetic-stripe credit card. Trial has

been instituted in both cases. Case has settled. Contact: Nicholas Stevens, Esq., Fish & Richardson, 60 South Sixth Street, Suite 3200, Minneapolis, MN 55402. (R)

354. *Daedalus Blue, LLC v. Microsoft Corporation*, Case 6:20-cv-01152-ADA (W.D. Texas). Served as an expert for plaintiff in an action alleging infringement by of U.S. Patent 7,177,886, relating to reliable backup to remote servers, U.S. Patent 7,437,730, relating to scalable on-demand virtual machine deployment, U.S. Patent 8,381,209, relating to hypervisor access control mechanisms, U.S. Patent 8,572,612, relating to scaling of virtual machines in a cloud computing environment, and U.S. Patent 8,671,232, relating to policy-based data management in storage-area networks. Case has settled. Contact: Robin Curtis, Esq., Bunsow De Mory LLP, 701 El Camino Real, Redwood City, CA 94063.

355. *Ebates Performance Marketing, Inc. d/b/a Rakuten Rewards v. International Business Machines Corporation*, IPR2022-00646, Patent Trial and Appeal Board. Served as an expert for Patent Owner in an *inter partes* review of U.S. Patent 7,631,646, relating to single sign-on in a federated computing environment. Claims 1–4, 12–16, 18, 19 found unpatentable; claims 5–11, 17, and 20 not unpatentable. Contact: Karim Oussayef, Esq., Desmarais, LLP, 230 Park Avenue, 26th Floor, New York, NY 10169. (D,R)

356. *Roku, Inc. v. IOENGINE, LLC*, IPR2022-01551, IPR2022-01552, IPR2022-01553, IPR2022-01554, Patent Trial and Appeal Board. Served as an expert for Patent Owner in inter-partes reviews of U.S. Patent 10,972,584, relating to a secure portable device implementing a plug-n-play VPN. Institution denied in all four cases. Contact: Greg Chuebon, Esq., Dechert LLP, Three Bryant Park, 1095 Avenue of the Americas, New York, NY 10036-6797. (R)

357. *Apple, Inc. v. Fintiv, Inc.*, IPR2023-00398, IPR2023-00399, Patent Trial and Appeal Board. Served as an expert for Patent Owner in inter-partes reviews of U.S. Patents 10,438,196 and 9,208,488, respectively, relating to an infrastructure supporting multiple mobile wallet providers. Result: no challenged claims unpatentable in either case. Contact: Marcus Barber, Esq., Kasowitz Benson Torres LLP, 333 Twin Dolphin Drive, Suite 200, Redwood Shores, CA 94065. (D,R)

358. *IOENGINE, LLC v. Roku, Inc.*, Case 6:21-cv-01296-ADA (W.D. Texas). Served as an expert for Patent Owner in a case alleging infringement of U.S. Patents 10,447,819 and 10,972,584, relating to a secure portable device implementing a plug-n-play VPN. Result: jury verdict of non-infringement, now subject to post-trial motions. Contact: Greg Chuebon, Esq., Dechert LLP, Three Bryant Park, 1095 Avenue of the Americas, New York, NY 10036-6797. (D,R,T)

359. *United States v. David Gerald Minkkinen et al.*, Case 2:22-cr-00613 (S.D. W.Va). Serving as an expert for defendant Minkkinen in a case alleging theft of trade secrets relating to statewide unemployment insurance systems. Contact: Mike Nogay, Esq., Sellitti, Nogay & Nogay, PLLC, 3125 Pennsylvania Avenue, Weirton, West Virginia 26062. (R)

360. *Hum Industrial Technology, Inc. v. Amsted Rail Company, Inc.*, IPR2023-00538, IPR2023-00539, IPR2023-00540, Patent Trial and Appeal Board. Served as an expert for Patent Owner in inter-partes reviews of U.S. Patents 9,365,223, 9,981,673, and 10,137,915,

repectively, relating to systems for detecting anomalies in train consists and railcars. Results: in 538, some claims found unpatenable. In 539, all challenged claims unpatentable. In 540, all challenged claims unpatentable. All decision on appeal to the Federal Circuit. Contact: Ryan N. Miller, Esq., Fox Rothschild LLP, 2000 Market Street, 20th Floor, Philadelphia, PA 19103-3222. (R)

361. *Entain Corporate Services Ltd. et al. v. GAN (UK) Limited*, IPR2023-00027, Patent Trial and Appeal Board. Served as an expert for Patent Owner in an inter-partes review of U.S. Patent 8,821,296, relating to casino management systems for linking online and offline gaming accounts. Result: all challenged claims unpatentable. Contact: Jarrad M. Gunther, Esq., Duane Morris LLP, 30 South 17th Street, Philadelphia, PA 19103-4196. (D,R)

362. *Ex Parte Reexamination of U.S. Patent 8,762,498*, Control No. 90/015,238. Served as an expert for Unified Patents in a reexamination of U.S. Patent 8,762,498, drawn to Internet communications through a virtual domain. All reexamined claims cancelled. Contact: Michael H. Jones. Esq., Rothwell, Figg, Ernst & Manbeck, P.C., 901 New York Avenue, N.W., Suite 900 East, Washington. DC 20001. (R)

363. *FaceTec, Inc. v. iProov Ltd.*, Case 2:21-cv-02252-ART-BNW (D. Nevada). Serving as an expert for Defendant/Counterclaim Plaintiff in an action alleging infringement of U.S. Patents 10,776,471 and 11,157,606 by iProov, relating to authentication through facial recognition, and infringement of U.S. Patent 9,621,548 by FaceTec, relating to online identity validation. Contact: Ryan E. Hatch, Esq., Hatch Law, P.C., 13323 Washington Blvd., Suite 100, Los Angeles, CA 90066.

364. *Lexos Media IP, LLC v. Abt Electronics, Inc.*, Case 1:22-cv-04878 (N.D. Ill.). Served as an expert for Plaintiff in an action alleging infringement of U.S. Patents 5,995,102, 6,118,449, and 7,975,241, relating to modifying a cursor image. Case has settled. Contact: Ken P. Kula, Esq., Buether Joe & Counselors, LLC, 1700 Pacific Avenue, Suite 4750 Dallas, Texas 75201.

365. *Lexos Media IP, LLC v. Amazon.com, Inc.*, Case 2:22-cv-00169-JRG (E.D. Texas), consolidated with *Lexos Media IP, LLC v. Target Corporation*, Case 2:22-cv-00175-JRG (E.D. Texas) and *Lexos Media IP, LLC v. Office Depot*, Case 2:22-cv-00273-JRG (E.D. Texas). Served as an expert for Plaintiff in an action alleging infringement of U.S. Patents 5,995,102, 6,118,449, and 7,975,241, relating to modifying a cursor image. Case has settled as to all defendants. Contact: Ken P. Kula, Esq., Buether Joe & Counselors, LLC, 1700 Pacific Avenue, Suite 4750 Dallas, Texas 75201. (D,R)

366. *Lexos Media IP, LLC v. MSC Industrial Direct Co., Inc.*, Case 3:22-cv-01736-X (N.D. Texas). Served as an expert for Plaintiff in an action alleging infringement of U.S. Patents 5,995,102, 6,118,449, and 7,975,241, relating to modifying a cursor image. Case has settled. Contact: Ken P. Kula, Esq., Buether Joe & Counselors, LLC, 1700 Pacific Avenue, Suite 4750 Dallas, Texas 75201.

367. *Lexos Media IP, LLC v. Nike, Inc.*, Case 2:22-cv-00311-JRG (E.D. Texas), consolidated with *Lexos Media IP, LLC v. Walmart, Inc.*, Case 2:22-cv-00175-JRG (E.D. Texas), *Lexos Media IP,*

LLC v. Ulta Beauty, Inc., 2:22-cv-00292-JRG (E.D. Texas), *Lexos Media IP, LLC v. Northern Tool and Equipment, Inc.*, 2:22-cv-00355-JRG (E.D. Texas), *Lexos Media IP, LLC v. The Gap, Inc.*, 2:22-cv-00299-JRG (E.D. Texas), and *Lexos Media IP, LLC v. CDW LLC*, 2:22-cv-00275-JRG (E.D. Texas). Served as an expert for Plaintiff in an action alleging infringement of U.S. Patents 5,995,102, 6,118,449, and 7,975,241, relating to modifying a cursor image. Case has settled as to all defendants. Contact: Ken P. Kula, Esq., Buether Joe & Counselors, LLC, 1700 Pacific Avenue, Suite 4750 Dallas, Texas 75201. (D,R)

368. *Lexos Media IP, LLC v. Overstock.Com, Inc.*, Case 2:22-cv-02324-JAR-ADM (D. Kan.). Served as an expert for Plaintiff in an action alleging infringement of U.S. Patents 5,995,102, 6,118,449, and 7,975,241, relating to modifying a cursor image. Contact: Ken P. Kula, Esq., Buether Joe & Counselors, LLC, 1700 Pacific Avenue, Suite 4750 Dallas, Texas 75201.

369. *CosmoKey Solutions GmbH & Co. KG v. Duo Security, Inc.*, 1:18-cv-1477 (D. Del.). Served as an expert for plaintiff in a case alleging infringement of U.S. Patent 9,246,903, relating to online multi-factor authentication. A jury found the patent not infringed under 35 U.S.C. § 273 and invalid. Contact: Scott Weingaertner, Esq., Goodwin Procter LLP, The New York Times Building, 620 Eighth Avenue, New York, NY 10018. (D,R,T)

370. *United Services Automobile Association v. Truist Bank*, 2:22-cv-00291-JRG-RSP (E.D. Texas). Served as an expert for plaintiff in a case alleging infringement of U.S. Patents 9,818,090, 10,482,432, 11,182,753, 11,544,944, and 11,625,770, relating to remote check deposit. Defendant has counterclaimed, asserting infringement of U.S. Patents 7,336,813, 7,519,214, relating to determining skew in digital images, U.S. Patents 7,283,644, 7,899,210, and 9.760,797, relating to an image-based security system, and U.S. Patent 8,136,721, relating to improvements in optical character recognition. Case has settled. Contact: Anthony Rowles, Esq., Irell & Manella LLP, 1800 Avenue of the Stars, Los Angeles, CA 90067-4276.

371. *RFCyber Corp. v. Visa U.S.A., Inc.*, 6:22-cv-00697-ADA (W.D. Texas). Served as an expert for Visa in a case alleging infringement of U.S. Patents 8,118,218, 8,448,855, 9,189,787, and 9,240,009, relating to mobile payment devices and funding electronic purses. Case has settled. Contact: James C. Yoon, Esq., Wilson Sonsini Goodrich & Rosati P.C., 650 Page Mill Road, Palo Alto, CA 94304-1050. (R)

372. *SitePro, Inc. v. Waterbridge Resources, LLC et al.*, 6:23-cv-00115-ADA-DTG (W.D. Texas). Served as an expert for SitePro in a case alleging infringement of U.S. Patents 8,649,909, 9,342,078, 9,898,014, 10,488,871, 11,175,680, and 11,294,403, relating to remote control of fluid-handling devices. Case has settled. Contact: M. Craig Tyler, Esq., Perkins Coie LLP, 405 Colorado Street, Suite 1700, Austin, TX 78701-0089.

373. *Diogenes Limited and Colossus (IOM) Limited v. DraftKings Inc.*, 1:21-cv-01695-MN-CJB (D. Del.). Serving as an expert for DraftKings in a case alleging infringement of U.S. Patents 8,721,439, 9,117,341, 9,275,516, 9,424,716, 9,704,338, 10,970,969, 10,997,822,and 11,200,779, relating to wagering methods, in particular, offering to cash out a wager on an event before the event has terminated. Infringement allegations were dropped at to the first seven patents; the

'779 patent was found invalid in IPR2023-00268. Case has settled. Contact: Jamie R. Lynn, Esq., Baker Botts L.L.P., 700 K Street N.W., Washington, DC 20001.

374. *Truist Bank v. United Services Automobile Association,* IPR2023-00183 (PTAB). Served as an expert for Patent Owner in an inter-partes review of U.S. Patent 11,182,753, relating to remote check deposit. Case has settled. Contact: Anthony Rowles, Esq., Irell & Manella LLP, 1800 Avenue of the Stars, Los Angeles, CA 90067-4276. (R)

375. *Redmon Jeang LLC v. TurnSignl, Inc. et al.*, 0:22-cv-02749-NEB-LIB (D. Minn.). Served as an expert for defendant in a case alleging infringement of U.S. Patents 11,443,395, 11,494,861, and 11,494,862, relating to systems and methods for contacting an attorney during a traffic stop. Defendant won a judgment on the pleadings that the claims were patent-ineligible. Contact: Mark Nelson, Esq., Barnes & Thornburg LLP, 2121 N. Pearl Street, Suite 700, Dallas, TX 75201.

376. *TurnSignl, Inc. et al. v. Redmon Jeang LLC,* IPR2024-00103, IPR2024-00104, IPR2024-00105, Patent Trial and Appeal Board. Served as an expert for Patent Owner in inter-partes reviews of U.S. Patents 11,443,395, 11,494,861, and 11,494,862, repectively, relating to systems and methods for contacting an attorney during a traffic stop. Petitions were withdrawn before institution based on the outcome of case 375, above. Contact: Mark Nelson, Esq., Barnes & Thornburg LLP, 2121 N. Pearl Street, Suite 700, Dallas, TX 75201. (R)

377. *MessageBird, B.V. et al. v. Validity, Inc.* , 1:22-cv-12116-NMG (D. Mass.). Served as an expert for defendant in a case alleging infringement of U.S. Patent 8,719,356, relating to monitoring deliverability of electronic mail. Case has settled. Contact: Jennifer Hayes, Esq., Nixon Peabody LLP, 305 S. Grand Avenue, Suite 4100, Los Angeles, CA 90071-3151.

378. *Cardware, Inc. v. Samsung Electronics, Co. Ltd. et al*, 2:22-cv-00141-JRG-RSP (E.D. Texas). Served as an expert for Defendants in a case alleging infringement of U.S. Patents 10,339,520, 10,628,820, 10,810,579, 11,176,538, and 11,328,286, relating to a device for simulating a magnetic-stripe credit card. Case has settled. Contact: Nicholas Stevens, Esq., Fish & Richardson, 60 South Sixth Street, Suite 3200, Minneapolis, MN 55402.

379. *Cortex MCP, Inc. v. VISA Inc.*, 5-23-cv-05720-FB (N.D. Cal.). Serving as an expert for defendant in an action alleging infringement of U.S. Patents 9,251,531, 9,954,854, 10,749,859, and 11,329,973, all relating to tokenization methods for securing electronic credentials, e.g., in electronic payment systems. Contact: Matthew Argenti, Esq., Wilson Sonsini Goodrich & Rosati, 650 Page Mill Road, Palo Alto, CA 94304.

380. *VISA Inc. v. Cortex MCP, Inc.*, IPR2024-00486, IPR2024-00487, IPR2024-00488, IPR2024-00489, and IPR2024-00490, Patent Trial and Appeal Board. Serving as an expert for Petitioner in inter partes reviews of U.S. Patents 9,251,531 (IPR2024-00486, IPR2024-00487), 9,954,854 (IPR2024-00488), 10,749,859 (IPR2024-00489), and 11,329,973 (IPR2024-00490), all relating to tokenization methods for securing electronic credentials, e.g., in electronic

payment systems. Contact: Matthew Argenti, Esq., Wilson Sonsini Goodrich & Rosati, 650 Page Mill Road, Palo Alto, CA 94304.

381. *Snap Inc. v. Playvuu, Inc.*, IPR2023-00848 (PTAB). Served as an expert for Patent Owner in an inter-partes review of U.S. Patent 10,931,911, relating to compositing multimedia content. Patent Owner requested adverse judgment. Contact: David Tsai, Esq., Pillsbury Winthrop Shaw Pittman LLP, Four Embarcadero Center, 22nd Floor San Francisco, CA 94111-5998. (R)

382. *Zigen, Inc. et al. v. Cabin Management Solutions et al.*, 4-23-cv-00210 (S.D. Texas). Serving as an expert for defendant in an action alleging misappropriation of trade secrets relating to customized aircraft audiovisual systems. Contact: Peter Vogel, Esq., VogelITLaw, 5925 Forest Lane, Suite 136, Dallas, TX 75230. (R)

383. *The Chosen, Inc. v. Angel Studios, Inc. v. Come and See Foundation, Inc.*, AAA 01-23-001-5829. Served as an expert for interested party Educational Media Foundation in an action alleging software copyright infringement. Contact: Thor Y. Urness, Esq., Bradley Arant Boult Cummings LLP, Roundabout Plaza, 1600 Division Street, Suite 700, Nashville, TN 37203.

384. *AirSlate, Inc. v. Inkit, Inc.*, 1:23-cv-01307-RGA-SRF (D. Del.). Served as an expert for defendant in a case alleging infringement of U.S. Patent 11,449,815, relating to automating document workflows. Result: Plaintiff dismissed the case before trial. Contact: John M. Hintz, Esq., Frost Brown Todd LLP, 205 E. 42nd Street, Suite 1900, New York, NY 10176. (R)

385. *CSC Serviceworks, Inc.. v. PayRange, Inc.*, IPR2023-01186, Patent Trial and Appeal Board. Served as an expert for patent owner in a post-grant review of U.S. Patent 8,856,045, relating to methods for authorizing payments wirelessly at vending machines. Case has settled. Contact: Matthew Argenti, Esq., Wilson Sonsini Goodrich & Rosati, 650 Page Mill Road, Palo Alto, CA 94304. (R)

386. *Mynette Technologies, Inc. et al. v. United States et al.*, 1:16-cv-01647-RTH (Fed. Claims). Serving as an expert for plaintiff in a case alleging infringement of U.S. Patents 7,719,425, 7,924,156, 9,524,458, and 9,569,777, relating to the use of NFC chips in passports. Contact: Robert Yorio, Esq., Carr & Ferrell LLP, 120 Constitution Drive, Menlo Park, CA 94025. (R)

387. *Ex Parte Reexamination of U.S. Patents RE46,386 and 8,924,502*, Control Nos. 90/019,142 and 90/019,143. Served as an expert for patent owner Aqua Connect in a reexamination of U.S. Patents RE46,386 and 8,924,502, relating to updating a user session in a Mach-derived system environment. All reexamined claims affirmed. Contact: Ryan E. Hatch, Esq., Hatch Law, P.C., 13323 Washington Blvd., Suite 100, Los Angeles, CA 90066. (R)

388. *Touchstream Technologies, Inc. v. Charter Communications, Inc. et al.*, 2:23-cv-00059-JRG (E.D. Texas). Served as an expert for defendant in a case alleging infringement of U.S. Patents 8,356,251, 11,048,751, and 11,086,934, relating to controlling a television display from a mobile device. Dr. Shamos testified at a jury trial on noninfringement and invalidity. Result:

jury verdict of noninfringement. Contact: Dina M. Hayes, Esq., Arnold & Porter Kaye Scholer LLP, 70 West Madison Street, Suite 4200, Chicago, IL 60602-4231. (D,R,T)

389. *Autoscribe Corporation v. Repay Holdings Corporation et al.,* 2:23-cv-0349-JRG (E.D. Texas). Serving as an expert for defendants in a case alleging infringement of U.S. Patent 11,620,621, relating to tokenization in an electronic payment system. Contact: David Harper, Esq., Haynes and Boone, LLP, 2801 N. Harwood Street, Suite 2300 Dallas, TX 75201. (R)

390. *SportsCastr Inc. d/b/a PANDA Interactive v. Genius Sports Ltd.,* 2:23-cv-0471-JRG (E.D. Texas). Serving as an expert for plaintiff in a case alleging infringement of U.S. Patents 10,425,697, 10,805,687, 11,039,218, and 11,871,088, all relating to synchonizing livestreamed video with related event information. Contact: Patrick Lafferty, Esq., King & Spalding LLP, 1700 Pennsylvania Avenue, NW, Suite 900, Washington, D.C. 20006. (R)

391. *SportsCastr Inc. d/b/a PANDA Interactive v. Sportradar Group AG,* 2:23-cv-0472-JRG (E.D. Texas). Serving as an expert for plaintiff in a case alleging infringement of U.S. Patents 10,425,697, 10,805,687, 11,039,218, and 11,871,088, all relating to synchonizing livestreamed video with related event information. Contact: Patrick Lafferty, Esq., King & Spalding LLP, 1700 Pennsylvania Avenue, NW, Suite 900, Washington, D.C. 20006.

392. *Adeia Guides, Inc. v. Videotron Ltd.,* T-841-21 (Fed. Ct. of Canada). Serving as an expert for plaintiff in a case alleging infringement of Canadian Patents 2,553,922, relating to providing a streaming version of a broadcast television program, 2,635,571, relating to delivering television program based on the receiver's display capabilities, 2,775,674, relating to selectively disabling trick play functions, and 2,967,187, relating to monitoring a user's viewing progress with a serial television program. Contact: Daniel Cappe, Esq., Goodmans LLP, Bay Adelaide Centre - West Tower, 333 Bay Street, Suite 3400, Toronto, ON M5H 2S7.

393. *Ex Parte Reexamination of U.S. Patents 10,447,819 and 10,972,584*, Control Nos. 90/019,292 and 90/019,293. Served as an expert for patent owner IOENGINE, LLC in reexaminations of U.S. Patents 10,447,819 and 10,972,584, relating to relating to a secure portable device implementing a plug-n-play VPN. Contact: Greg Chuebon, Esq., Dechert LLP, Three Bryant Park, 1095 Avenue of the Americas, New York, NY 10036-6797. (R)

394. *Thentia Corporation v. Julian Cardarelli, GovCore Canada, Inc., et al.,* CV-24-00726669-0000 (Ontario Super. Ct.). Serving as an expert for plaintiff in a case alleging misappropriation of trade secrets relating to a system for automating regulatory agency activities. Contact: Dena Varah, Esq., Lenczner Slaght LLP, 130 Adelaide St. W., Suite 2600, Toronto, ON, Canada M5H 3P5. (R)

395. *Ex Parte Reexamination of U.S. Patent 8,407,722*, Control No. 90/019,662. Served as an expert for Unified Patents in a reexamination of U.S. Patent 8,407,722, drawn to an Internet routing architecture. Contact: Jessica Marks, Esq., Unified Patents, 4445 Willard Avenue, Suite 600, Chevy Chase, MD 20815. (R)

396. *Monticello Enterprises LLC. v. Macy's Inc., et al.,* 6:23-00753-XR (W.D. Texas) (lead case), consolidated with *Monticello Enterprises LLC. v. Petco Health & Wellness Co, Inc. et al.,* 6:23-cv-00761-XR and *Monticello Enterprises LLC. v. Starbucks Corporation,* 6:23-cv-00763. Serving as an expert for defendants in a case alleging infringement of U.S. Patents 9,824,408, 10,121,186, 10,643,266, 11,004,139, 11,461,828, and 11,468,497, relating to on-line, wireless, and in-app payment systems. Contact: Bryan P. Clark, Esq., The Webb Law Firm, One Gateway Center, 420 Ft. Duquesne Blvd., Suite 1200, Pittsburgh, PA 15222. (R)

397. *Ex Parte Reexamination of U.S. Patent 8,370,457.* Served as an expert for Unified Patents in a reexamination of U.S. Patent 8,370,457, drawn to network communication through a virtual domain. Contact: Stephen A. Courtiaus, Esq., Slater Matsil, LLP, 17304 Preston Rd., Suite 900, Dallas, TX 75252. (R)

398. *Hanshow Technology Co., Ltd. v. SES-Imagotag SA et al.,* 2:23-cv-00174-RWS-RSP (E.D. Texas). Served as an expert for defendants in a case alleging infringement of U.S. Patents 8,346,210, 9,641,994, and 11,540,216, relating to managing services through the use of RFID and NFC tags. Case has settled. Contact: Matt Acosta, Esq., Platt Richmond PLLC, 101 N. Riverfront Blvd., Suite 150, Dallas, TX 75207. (D,R)

399. *NEC Corporation. v. Becker Professional Development Corporation,* 4:24-cv-00647-O (N.D. Texas). Served as an expert for defendant in a case alleging infringement of U.S. Patents 8,595,779, relating to pausing live video for time-shifted viewing, and 8,909,809, relating to adaptive bitrate streaming. Case has settled. Contact: Jacob Zambrzycki, Esq., Moore & VanAllen, 100 N. Tryon Street., Suite 4700, Charlotte, NC 28202-4003. (D,R)

400. *Hanshow Technology Co., Ltd. v. SES-Imagotag SA et al.,* 2:23-cv-00617-RWS-RSP (E.D. Texas). Served as an expert for defendants in a case alleging infringement of U.S. Patents 10,701,321, relating to analysis of images in video surveillance systems, and 11,087,272, relating to identifying and counting items on store shelves through robotic image capture. Case has settled. Contact: Matt Acosta, Esq., Platt Richmond PLLC, 101 N. Riverfront Blvd., Suite 150, Dallas, TX 75207. (R)

401. *Caselas, LLC v. Capital One, NA,* 6:22-cv-0293-ADA (W.D. Texas) and *Caselas, LLC v. Wells Fargo Bank, NA,* 6:22-cv-0295-ADA (W.D. Texas). Served as an expert for defendants in a case alleging infringement of U.S. Patents 7,529,698, 7,661,585, 9,117,206, 9,117,230, and 9,715,691, all relating to providing information about charge-backs in credit reports. Result: all asserted claims found patent-ineligible in 1:21-cv-03480-VMC (N.D. Ga.), affirmed by the Federal Circuit. Contact: Robert A, Angle, Esq., Troutman Pepper Locke LLP, Troutman Pepper Building, 1001 Haxall Point, 15th Floor Richmond, VA 23219.

402. *American Airlines, Inc. and Southwest Airlines Co. v. Intellectual Ventures I LLC,* IPR2025-00785, Patent Trial and Appeal Board. Serving as an expert for Petitioners in an inter partes review of U.S. Patent 7,257,582, relating to methods of parallel processing. Contact: John Campbell, Esq., McCool Smith, P.C., 303 Colorado Street, Suite 2100, Austin, TX 78701. (R)

403. *Mudflap, Inc. v. Sky Capital Group, LLC et al.*, (Sup. Ct. Santa Clara Cty., CA), *Mudflap, Inc. v. Patterson et al.*, JAMS Case No. 5100001313, and *Mudflap, Inc. v. Patterson et al.*, AAA Case No. 01-23-0002-8859. Served as an expert for Complainant in arbitrations concerning misappropriation of trade secrets concerning a closed-loop system for truck fuel purchases. Cases were resolved favorbly to Mudflap. Contact: Kevin O'Brien, Esq., ALto Litigation, 4 Embarcadero Center, San Francisco, CA 94111.

404. *Apple, Inc. v. Varia Holdings LLC*, IPR2024-01362, -01363, -01364, Patent Trial and Appeal Board. Serving as an expert for Patent Owner in inter partes reviews of, respectively, U.S. Patents 8,381,974, 9,405,947, and 8,127,984, relating to methods of simulating NFC signals. Contact: Timothy Gilman, Esq., Schulte Roth & Zabel, LLP., 919 Third Avenue, New York, NY. (R)10022.

Legislative Testimony

Testimony before the Texas Legislature concerning electronic voting, Austin, Texas, 1987. Result: passage of the Texas Electronic Voting Law.

Invited testimony before the British House of Lords, Subcommittee B of the European Union Committee, April 20, 2000. Subject: European regulation of eCommerce.

Testimony before the Pennsylvania Legislature State Government Committee concerning electronic voting, Philadelphia, March 10, 2004.

Testimony before the United States Commission on Civil Rights concerning electronic voting, Washington, DC, April 9, 2004.

Testimony before the U.S. House of Representatives Committee on Science concerning voting system certification, Washington, DC, June 24, 2004.

Testimony before the U.S. House of Representatives Committee on House Administration concerning voting system security, Washington, DC, July 7, 2004.

Testimony before the U.S. House of Representatives Committee on Government Reform concerning electronic voting technology, Washington, DC, July 20, 2004.

Testimony on DREs and paper trails before the Virginia Legislature Study Commission on Voting System Certification and Security, Richmond, VA, August 16, 2004.

Testimony before the Election Assistance Commission, Technical Guidelines Development Committee, Subcommittee on Computer Security and Transparency, Gaithersburg, MD, Sept. 20, 2004.

Testimony before the House Ways and Means Committee of the Maryland General Assembly on voting machine paper trails, Annapolis, MD, December 7, 2004.

Testimony before the U.S. House of Representatives Committee on House Administration concerning paper trails, Washington, DC, September 28, 2006.

Testimony before the U.S. Election Assistance Commission concerning the Voting System Testing and Certification Program, Washington, DC, October 26, 2006.

Testimony before the Georgia State Board of Elections, Powder Springs, GA, December 21, 2007.

Testimony before the Maryland House of Delegates Ways and Means Committee, Annapolis, MD, January 18, 2007.

Testimony before the U.S. Senate Committee on Rules and Administration on the Ballot Integrity Act of 2007, Washington, DC, July 25, 2007.

Testimony before the Pennsylvania Senate State Government Committee, March 18, 2024.

Arbitration

Dr. Shamos has served as an arbitrator in computer-related disputes for the American Arbitration Association.

Electronic Voting

Dr. Shamos has served as an examiner of electronic voting systems and consultant on electronic voting.

Member, Sarasota Source Code Audit Task Force, Florida Secretary of State (2007-2008)

Consultant to the Pennsylvania Secretary of the Commonwealth (2004-).

Consultant to the Massachusetts Secretary of the Commonwealth (2006).

Project SERVE Security Peer Review Group (2003).

Attorney General's Designee for electronic voting examinations, State of Texas (1987-2000).

Statutory Examiner for electronic voting, Commonwealth of Pennsylvania (1980-1996).

Consultant to Montgomery County, Pennsylvania (1996).

Consultant to the Secretary of State of Nevada (1996).

Consultant to the Delaware Legislature (1989).

Consultant to the Secretary of State of West Virginia (1984).

Business Experience

President, Expert Engagements LLC, expert witness firm (2003-present).

President, Unus, Inc., database publishing software (formerly Unilogic, Ltd.) (1990-1992)

President, Notifax Corporation (1989-1994). Automated notification by facsimile.

President, Lexeme Corporation (1984-87), software language translation products.

Managing Partner, Shamos and Tchen (1978-82), computer consulting firm.

Supervisory Programmer, National Cancer Institute (1970-72), while a commissioned officer in the United States Public Health Service (O-3).

Associate Engineer, IBM Corporation (1968-70) (Components Division), design of manufacturing information systems.

Consulting

Morgan Stanley Dean Witter (2000-2002) (now Morgan Stanley).

McKinsey & Co. (1999-2001).

Bell Atlantic Corporation (1999-2008) (now Verizon).

LG-CNS, South Korea (2002-2004). Project to automate the Korean court system.

Directorships

Unilogic, Ltd. (1979–87) (later Unus, Inc. d/b/a Cygnet Publishing Technologies, 1987-2013). Database publishing software.

The Billiard Archive (1983–), also Curator. Historical nonprofit foundation.

Lexeme Corporation (1984-1987). Computer source language translation.

Notifax Corporation (1989-1994)

Insurance Technology Corporation (1992–1995). IT consulting for the insurance industry.

Personal Data

Date of birth: April 21, 1947.

Married to Julie Shamos (formerly Julie Van Allen), August 12, 1973.

Children: Josselyn (born May 20, 1982), Alexander (born August 3, 1984).

Grandchildren: Harlow Elizabeth Crane (born April 9, 2010), Bishop Moses Crane (born July 13, 2012), Amelia Eleanor Shamos (born April 17. 2019), Sophia Anastasia Shamos (born March 14, 2021)

Military Status: Veteran (Commissioned Officer, U.S. Public Health Service, 1970-72).

Contact Information

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Email: shamos@cs.cmu.edu

Publications

Google Scholar citations. Erdös number = 3: Erdös -> {Daniel Kleitman, Patrick O'Neill, Joel Spencer} -> Albert Meyer -> Shamos

SCIENCE

Books

1. *Computational Geometry: An Introduction*, with F. P. Preparata. Springer-Verlag (1985, revised ed., 1991), 390 pp. ISBN 0387961313. According to CiteSeer in 2012, this is the 93rd most cited work in the field of computer science.

2. *Вычислительная геометрия: введение*. Russian translation of "Computational Geometry: An Introduction." Moscow: Mir Publishers (1989). ISBN 5030010416.

3. 计算几何导论 (Jìsuàn jǐhé dǎolùn) Chinese translation by Zhuang Xingu of "Computational Geometry: An Introduction." Science Press (1990). ISBN 9787030018366.

4. *Keisan kikagaku nyumon*. Japanese translation by T. Asano and T. Asano of *Computational Geometry: An Introduction*, with F. P. Preparata. Soken Shuppan (Jul. 1992). ISBN 4795263213.

5. *Handbook of Academic Titles*. 193 pp. (Jan. 2011). An encyclopedia of various academic designations used at over 1000 colleges and universities in the United States.

6. *Geometria obliczeniowa. Wprowadzenie*. Polish translation of "Computational Geometry: An Introduction." Warsaw: Helion (2003) 392 pp. ISBN 83-7361-098-7.

7. *Shamos's Catalog of the Real Numbers*. A list, patterned after Sloane & Plouffe, The Encyclopedia of Integer Sequences, Academic Press (1995). Over 10,000 interesting real numbers arranging in lexical order by decimal expansion, with accompanying formulas.

Book Chapters

1. "Privacy and Public Records." Chapter 16 in *Personal Information Management*, Jones & Teevan, eds., Univ. of Washington Press (2007), ISBN978-0-295-98737-8.

Articles

1. "On the Piezoelectric Effect in Bone," with M. H. Shamos and L. S. Lavine. *Nature* **197**:81 (1963).

2. "An Absorber Theory of Acoustical Radiation," with M. A. Tavel. *Journal of the Acoustical Society of America* **54**:46–49 (1973).

3. "Problems in Computational Geometry." Unpublished book manuscript (1974, revised 1977). Distributed in photocopy.

4. "Geometric Complexity." *Proceedings of the Seventh Annual ACM Symposium on Automata and Theory of Computation* (May 1975) 224–233.

5. "Closest-point Problems," with D. J. Hoey. *Proceedings of the Sixteenth IEEE Symposium on Foundations of Computer Science* (Oct. 1975) 151–162.

6. "Divide and Conquer in Multidimensional Space," with J. L. Bentley. *Proceedings of the Eighth Annual ACM Symposium on Automata and Theory of Computing* (May 1976) 220–230.

7. "Geometric Intersection Problems," with D. J. Hoey. *Proceedings of the Seventeenth Annual IEEE Symposium on Foundations of Computer Science* (Oct. 1976) 208–215.

8. "Lower Bounds from Complex Function Theory," with G. Yuval. *Proceedings of the Seventeenth Annual IEEE Symposium on Foundations of Computer Science* (Oct. 1976) 268–273.

9. "Geometry and Statistics: Problems at the Interface." In *Algorithms and Complexity: New Directions and Recent Results*, J. F. Traub, ed., Academic Press (1976) 251–280.

10. "Divide and Conquer for Linear Expected Time," with J. L. Bentley. *Information Processing Letters* 7 (1977) 87–91.

11. "A Problem in Multivariate Statistics: Algorithm, Data Structure, and Applications," with J. L. Bentley. *Proceedings of the Fifteenth Allerton Conference on Communications, Control and Computers* (Sep. 1977) 193–201.

12. "Optimal Algorithms for Structuring Geographic Data," with J. L. Bentley. *Proceedings of the Harvard Conference on Topological Data Structures for Geographic Information Systems* (Oct. 1977) 43–51.

13. "Computational Geometry." Ph.D. Thesis, Yale University (1978). University Microfilms, Ann Arbor, MI.

14. "Time and Space," with A. R. Meyer. In *Perspectives on Computer Science*, A. K. Jones, ed. Academic Press (1978).

15. *Combinatorics on Graphs I: Graph Polynomials*. Unpublished book manuscript (1978).

16. "Robust Picture Processing Operators and Their Implementation as Circuits." *Proceedings of the Fall 1978 Workshop on Image Processing*, Carnegie Mellon University (1978).

17. "A practical system for source language translation," with T. R. Kueny and P. L. Lehman. *Proceedings of the National Conf. on Software Reuseability and Maintainability*, pp. B-1 – B-12, Washington, DC (Sep. 1986).

18. "The Early Years of Computational Geometry – A Personal Memoir." *Advances in Discrete and Computational Geometry* (B. Chazelle, J. E. Goodman, and R. Pollack, eds.), *Contemporary Mathematics*, Amer. Math. Soc., Providence (1998).

19. "A Multiparty Computation for Randomly Ordering Players and Making Random Selections," with Latanya Sweeney. Carnegie Mellon Univeristy School of Computer Science Technical Report CMU-ISRI-04-126 (July 2004)

20. *Overcounting Functions*. A systematic method of transforming certain multiple summations into single summations, with new number-theoretic results.

21. *Property Enumerators and a Partial Sum Theorem*. A new result allowing rapid symbolic evaluation of certain types of double summations.

DIGITAL LIBRARIES

Articles

1. "Machines as readers: a solution to the copyright problem." J. Zhejiang Univ. Science 6A, 11, pp. 1179-1187 (Nov. 2005).

Book Chapters

1. "The Universal Digital Library: Intelligent Agents and Information on Demand," with Raj Reddy. Chapter 6 in Emerging Communication Technologies and the Society, by N. Balakrishnan, Indian National Science Academy (2000). ISBN 81-7319-341-X.

Reports

1. "Japanese Digital Information Policy, Intellectual Property and Economics," in "Digital Information Organization in Japan," International Technology Research Institute (1999).

ELECTRONIC VOTING

Books

1. "Glossary of Electronic Voting."

Articles

2. "Voting System Certification — An Examiner's View." Invited paper presented at the Election Center Conference, Reno, Nevada (Sep. 1989).

3. "Electronic Voting — Evaluating the Threat." Proc. Third ACM Conf. on Computers, Freedom & Privacy, San Francisco, CA (Mar. 1993).

4. "Paper v. Electronic Voting Records — An Assessment." Proc. 14th ACM Conf. on Computers, Freedom & Privacy, Berkeley, CA (Apr. 2004).

5. "Evaluation of Voting Systems," with P.L. Vora, B. Adida, R. Bucholz, D. Chaum, D. Dill, D. Jefferson, D. Jones, W. Lattin, A. Rubin and M. Young, Commun. ACM 47(11):144 (2004).

6. "Voting as an Engineering Problem." *The Bridge* (publication of the National Academy of Engineering), Summer 2007, pp. 35-39.

7. "Realities of E-Voting Security," with A. Yasinsac. IEEE Security and Privacy 10:5 (Sep/Oct 2012), pp. 16-17. Also guest editor of that issue, devoted to E-voting Security.

8. "Why our voting systems are safe." Op-ed in the Pittsburgh Post-Gazette, Dec. 31, 2016.

Published Reports

9. "Software and Security Analysis of the ES&S iVotronic 8.0.1.2 Voting Machine Firmware," with Yasinsac et al., February 23, 2007. Review commissioned by the Secretary of State of Florida to investigate irregularities in the Florida Congressional District 13 election of 2006.

BILLIARDS

Books

1. *Pool.* New York: Mallard Press division of Bantam-Doubleday-Dell Promotional Book Company (Aug. 1991). 128 pp. ISBN 0-7924-5310-7.

2. *Le billard et le billard américain*. Paris: Minerva, 1992, reprinted 1997. 128 pp. Translation by Jean-Yves Prate of the author's American book, *Pool*. ISBN 2–8307–0160–7 (1992), 2-8814-3135-6 (1997).

3. *The Illustrated Encyclopedia of Billiards*. New York: Lyons & Burford (1993). 310 pp. ISBN 1-55821-219-1.

4. *Pool Snooker Carambola*. Padua: Facto Edizioni (1993). 128 pp. Italian translation of *Pool*. Translated by Elisabetta Bezzon. ISBN 88-85860-20-6. The first English-language billiard book ever published in Italian.

5. *Pool*. New York: Friedman/Fairfax (Jun. 1994). 128 pp. ISBN 1-56799-061-4. Paperback edition of the author's 1991 *Pool*.

6. *Shooting Pool: The People, the Passion, the Pulse of the Game,* with photographs by George Bennett. New York: Artisan (Jun. 1998). 144 pp. ISBN 1-885183-95-X. A photographic survey of pool in the U.S. in 1997. A Book-of-the-Month Club bonus selection (Fall, 1998).

7. *Setting the Stage for Fifty Years*. Coralville, IA: Billiard Congress of America (Jun. 1998). 88 pp. A history of the Billiard Congress of America.

8. *The New Illustrated Encyclopedia of Billiards*. New York: Lyons Press (1999). 320 pp. ISBN 1-55821-797-5. An expanded and revised edition of *The Illustrated Encyclopedia of Billiards*.

9. *The Complete Book of Billiards*. New York: Gramercy Books (2000). 306 pp. ISBN 0-517-20869-5. Reissue of author's 1993 *The Illustrated Encyclopedia of Billiards*.

In Preparation

SCIENCE

Articles

1. *A Graph-Theoretic Model of Electronic Payment Systems*, with Michael Trick.

LAW

Books

1. *A Dictionary of American Intellectual Property* (1995).

Invited Talks

ELECTRONIC COMMERCE

"The Future of eCommerce." Presentation to the Association for Corporate Growth, Pittsburgh, PA (Dec. 2001).

"The U.S., Korea and the Internet Bubble." Korea International Trade Association (Seoul, July 2003).

"Electronic Judiciary Services in the United States." Address at the Supreme Court of Korea (Dec. 2004).

"eGovernment in the United States." Public address at the University of Hong Kong (Feb. 2005).

"Global SCM as a Cross-Border eCommerce Model," Korea International Trade Association, Seoul, Korea (Mar. 2007).

"Innovate or Die." Invited talk at the Verizon Leadership Meeting, Morristown, NJ (Jun. 2007).

"A Formula for Innovation." Public address at the University of Hong Kong (Feb. 2008).

"Ask My Robot: How Computers Answer Questions." University of Hong Kong (Feb. 2013).

"How Bitcoin Works: A Non-Technical Introduction." University of Hong Kong (Mar. 2014).

"What's a Bitcoin? A Non-Technical Introduction." Carnegie Mellon University (Oct. 2014).

COMPUTER SCIENCE

"Surprises in Experimental Mathematics." Carnegie Mellon University Mathematics Seminar (Feb. 2002).

"Learning by Doing or Learning by Listening?" University of Hong Kong (Feb. 2007).

"Discoveries in Experimental Mathematics." University of Hong Kong (Feb. 2009).

"How Did It (Computational Geometry) Start?" Keynote address at the 20th Canadian Conference on Computational Geometry, Montreal, Canada (Aug. 2008).

"The Internet of Everything." University of Hong Kong (Mar. 2015).

"How Do Driverless Cars Work?" University of Hong Kong (Mar. 2017).

"How Machines Learn (Without Being Taught)." University of Hong Kong (Feb. 2018).

"What is Quantum Computing All About?" University of Hong Kong (Feb. 2019).

SCIENCE AND LAW

"Digital Property in the 21st Century." Keynote address for the Spring Meeting of the American Intellectual Property Law Association, Pittsburgh, PA (May 2000). View slides.

"Who Owns This Algorithm?" Carnegie Mellon University (Nov 1991); Microelectronics and Computer Corporation (Jan. 1992); Univ, of Texas at Austin (Jan. 1992); UCLA (Feb. 1992).

"New Computer Technology and Its Application to Worker's Compensation." Forum IV, Newport Beach, CA (Feb. 1992).

"The Office of the Future, If There Is One." 1994 IAIABC Conf., Pittsburgh, PA (Sep. 1994).

"The Fringes of Infringement." University of Texas, Austin, TX (Sep. 1995).

"The Arts and the Internet." Allegheny County Bar Association Continuing Legal Education course (June 26, 1996).

"The Universal Information Resource." Inventing the Future, Symposium in Honor of Raj Reddy's 60th Birthday, Carnegie Mellon University, Pittsburgh, PA (May 1998).

"The Universal Library." University of Texas at Austin (Sep. 1998)

"The Universal Library and Its Role in Scientific Information." Keynote address to the RNA Society symposium on Emerging Sources of RNA Information, Arlington, VA (Dec. 8, 1998).

"Digital Property in the 21st Century." Luncheon address to the American Intellectual Property Law Association, Pittsburgh, PA (May. 2000).

"Copyright Protection and Distance Learning." Hong Kong Intellectual Property Office (Feb. 2002).

"The Universal Dictionary." Address at International Institute of Information Technologies (IIIT), Hyderabad, India (Jan. 2003).

"The Million Book Projects." Public address at the University of Hong Kong (Jan. 2003).

"Mathematics and the Privacy Laws." ALADDIN Workshop on Privacy in D.A.T.A., Pittsburgh, PA (Mar. 2003).

"Machines as readers: a solution to the copyright problem." 1st Int'l Conf. on Universal Digital Library, Hangzhou, China (Nov. 2005).

"Your Books Might Cost More Now: The Role of the Expert in Software Patent Litigation." University of Hong Kong (Feb. 2006).

"University Technology Transfer: How to Fix It." Asia Conference on Technology Transfer (ACTT) 2006, Seoul, S. Korea (Mar. 2006).

"How Big a Problem is Copyright"? USAIN Conference, Cornell University, Ithaca, NY (Oct. 2006).

"Digital Ownership." 2d Intl. Conf. on Universal Digital Library, Alexandria, Egypt (Nov. 2006).

"Google and the Death of Books." University of Hong Kong (Feb. 2010).

"FaceWars." (About the lawsuit between Facebook and the Winkelvoss twins). University of Hong Kong (Feb. 2011).

"Swiping the iPhone: Billions Lost With the Stroke of a Pen." University of Hong Kong (Feb. 2012).

"Global Phone Wars: Apple v. Samsung." University of Hong Kong (Mar. 2016).

ELECTRONIC VOTING

"Voting System Certification — An Examiner's View." Election Center Conference, Reno, Nevada (Sep. 1989).

"Electronic Voting — Evaluating the Threat." Third Conf. on Computers, Freedom and Privacy, San Francisco, CA (Mar. 1993).

"What's Happing in Florida?" Carnegie Mellon University (Nov. 2001)."

"Electronic Voting: The Technology of Democracy." Hong Kong University (Feb. 2004).

"Theory v. Practice in Electronic Voting." DIMACS (Rutgers Univ., May 2004).

"HAVA: Are We Ready?" Panel at the League of Women Voters National Convention, Washington, DC (Jun. 2004).

"Testing Voting Machines." Panel at the American Enterprise Institute, Washington, DC (Jun. 2004).

"Electronic Voting: Promise and Peril." Talk at the Moritz College of Law, Ohio State University (Sep. 2004).

"Is e-voting ready for prime time: Legal and technical issues regarding the upcoming Presidential election." Panel at John Marshall Law School (Chicago, IL, Oct. 2004).

"Is Electronic Voting Reliable?" Talk to the Kiwanis Club of Dubuque, Iowa (Feb. 2005).

"The Top Ten Problems in Practical Electronic Voting." Int'l Workshop on Mathematics and Democracy, Ettore Majorana Centre, Erice, Sicily (Sept. 2005).

"Why Don't We Have Paper Trails in Pennsylvania?" Carnegie Mellon Univ. CyLab Seminar, Pittsburgh, PA (Jan 2006).

"Paper Trails and the Pennsylvania Certification Process." County Commissioners Association of Pennsylvania 2006 Spring Conference, Harrisburg, PA (Mar. 2006).

"The 2006 Elections: Are We Ready?" Panel at the American Enterprise Institute, Washington, DC (Sept. 2006).

"What's Right with Electronic Voting?" University Lecture Series, Carnegie Mellon University (Oct. 12, 2006).

"What Happened in Yesterday's Election?" Center for Research on Computation and Society, Harvard University (Nov. 8, 2006).

"What Happened in Sarasota County"? Council on Government Ethics Laws, New Orleans, LA (Dec. 6, 2006).

"What Happened to 18,000 Votes? Results of the Sarasota Source Code Audit." Carnegie Mellon University (Apr. 16, 2007).

"Opscan Voting: The Good, the Bad and the Ugly." Florida State Association of Supervisors of Elections, Destin, Florida (May 24, 2007).

"Voting Machine Fraud." University of Pittsburgh (Nov. 11, 2008)