

ARTICLE

PATENTS WITHOUT PAPER: PROVING A DATE OF INVENTION WITH ELECTRONIC EVIDENCE

*Lisa A. Dolak**

Table of Contents

I. INTRODUCTION	472
II. ATTRIBUTES OF ELECTRONIC RECORDS	478
III. ADMISSIBILITY OF ELECTRONIC RECORDS IN FEDERAL COURT LITIGATION	480
A. <i>Evidentiary Rules Applicable to Electronic Record Evidence in Federal Judicial Proceedings</i>	481
B. <i>Federal Court Determinations on the Admissibility of Electronic Records</i>	484
1. <i>Foundation Required for Electronic Records</i>	485
2. <i>Objections to the Admissibility of Electronic Records</i>	486
IV. ELECTRONIC EVIDENCE IN PATENT INTERFERENCE PROCEEDINGS	489
A. <i>Overview of Interference Proceedings</i>	489
B. <i>The Requirement for Corroboration in Interference Proceedings</i>	495
1. <i>Independent Evidence of Invention is Required</i> ..	495

* Assistant Professor, Syracuse University College of Law; Of Counsel, Nixon, Hargrave, Devans & Doyle LLP. The views expressed herein are my present views and do not necessarily represent the views of my firm or its clients. I would like to thank Richard D. Rochford, Jr. for his helpful comments, and Renee Mitchell, Kerrie Barney, and Brian Vogel for their research assistance.

2.	<i>Corroboration vs. Admissibility</i>	499
3.	<i>The Rule of Reason</i>	503
C.	<i>The Laboratory Notebook</i>	511
V.	CREATING AND MAINTAINING RELIABLE ELECTRONIC PROOF OF PRIORITY.....	515
A.	<i>Attributes of Reliable Electronic Record-Keeping Systems</i>	515
1.	<i>Author's Signature</i>	516
2.	<i>Dating Notebook Entries</i>	519
3.	<i>Alteration of Notebook Entries</i>	520
4.	<i>Witnessing Notebook Entries</i>	520
B.	<i>Electronic Proof of Conception vs. Reduction to Practice</i>	523
1.	<i>Inherently Different Nature of Events to Be Proven</i>	523
2.	<i>Implications for Electronic Laboratory Notebook Systems</i>	525
VI.	CONCLUSION	530

I. INTRODUCTION

Many high stakes patent battles are fought in interference proceedings conducted by the U.S. Patent and Trademark Office ("PTO"). Although various issues of patentability, validity, and enforceability may be considered during an interference proceeding, the central issue to be resolved is which of two or more parties first invented the subject matter at issue. Often, critical proof of inventive activities is found in laboratory notebooks—bound, paper notebooks in which researchers document their work. To conform to strict evidentiary requirements in interference proceedings, such as the rule that an inventor's evidence of invention must be corroborated, lab notebooks are traditionally signed and dated by the inventor and a witness.¹

Because researchers increasingly use computers to conduct and document their work, issues have arisen concerning whether computer, or electronic, records meet the rigorous evidentiary standards imposed in interference proceedings. Recently, the PTO issued a notice stating that "electronic records are admissible as evidence in interferences . . . to the same extent

1. Refer to notes 248-52 *infra* and accompanying text.

that electronic records are admissible under the Federal Rules of Evidence.² The notice is good news for the many research organizations that record and store evidence of research efforts and results via computer, because electronic records are widely admissible under the Federal Rules of Evidence. If steps are taken to ensure the reliability of electronic research records, such records can satisfy even the heightened evidentiary requirements that govern efforts to prove invention dates. In fact, the use of computers for the creation and maintenance of research records can provide evidentiary and operational advantages over reliance on paper records.

This Article first describes the attributes of electronic records and the admissibility of such records under the Federal Rules of Evidence. Second, this Article discusses interference proceedings, the rules of evidence applied in such proceedings, and the use of evidence contained in laboratory notebooks to prove priority of invention. Finally, this Article asserts that evidence in electronic laboratory notebooks, if recorded and maintained through secure and reliable systems and procedures, can both satisfy the standards for admissibility under the Federal Rules of Evidence and provide evidentiary benefits beyond those attainable with paper records.

Under U.S. patent law, only one patent may be awarded for each invention and, as between two or more inventors claiming to have made the same invention, the patent is awarded to the party who can demonstrate that he or she made the invention first.³ An *interference* is a proceeding instituted in the PTO, before a tribunal known as the Board of Patent Appeals and Interferences (the "Board"), to determine which of two or more parties claiming the same patentable invention is entitled to a patent.⁴

2. *Admissibility of Electronic Records in Interferences*, OFF. GAZ. PAT. OFF., Mar. 10, 1998, at 14 [hereinafter PTO NOTICE].

3. Refer to notes 105-08 *infra* and accompanying text (describing the determination of priority of invention in patent interference proceedings).

4. See 35 U.S.C. § 135(a) (1994); see also 37 C.F.R. § 1.601(i) (1998). Traditionally, interference proceedings were limited to a determination of priority of invention, that is, which party was the first to invent the common subject matter claimed in two or more applications, or in one or more applications and one or more issued patents. See, e.g., *Beech Aircraft Corp. v. Edo Corp.*, 990 F.2d 1237, 1248-49 (Fed. Cir. 1993); *In re Van Geuns*, 946 F.2d 845, 847-48 (Fed. Cir. 1991) (explaining that before the 1984 amendments to the 1952 Patent Act, which streamlined interference procedures, the Board decided questions of priority of invention only); *Brown v. Braddick*, 595 F.2d 961, 963 n.1 (5th Cir. 1979) (describing an interference as a patent office proceeding to determine priority among rival claimants to patents involving the same or similar subject matter). However, a 1984 amendment to § 135(a) of the patent statute provides that the Board shall determine questions of

Interference proceedings before the Board⁵ are governed by the Federal Rules of Evidence⁶ and certain strict, judge-made evidentiary requirements.⁷ The Board and the courts⁸ require that the testimony of the inventor concerning his or her inventive activities, and the dates those activities occurred, must be corroborated by independent, substantiating evidence.⁹ This

priority of the inventions and may determine questions of patentability. *See* Patent Law Amendment Act of 1984, Pub. L. No. 98-622, § 202, 98 Stat. 3383, 3386-87 (current version at 35 U.S.C. § 135(a)); *see also* 37 C.F.R. § 1.601(i) (stating that an interference is a proceeding before the Board in the U.S. Patent and Trademark Office ("PTO") to determine questions of patentability and priority of invention). Thus, the Board is required by statute to resolve priority issues in an interference proceeding. *See Beech Aircraft*, 990 F.2d at 1248-49. In addition, the Court of Appeals for the Federal Circuit has held that all issues of patentability that have been fully developed before the Board should be resolved by the Board. *See Perkins v. Kwon*, 886 F.2d 325, 328 (Fed. Cir. 1989).

5. The Board consists of the Commissioner of the Patent and Trademark Office, the Deputy Commissioner, the Assistant Commissioners, and the examiners-in-chief. *See* 35 U.S.C. § 7(a). Each interference is heard by at least three members of the Board, who are designated by the Commissioner. *See id.* § 7(b).

6. *See* 37 C.F.R. § 1.671(b).

7. Refer to notes 126-28 *infra* and accompanying text (discussing the strict requirements for establishing an inventor's diligence in reducing an invention to practice) and Part IV.B.1 *infra* (describing the requirement that all inventive activity be corroborated).

8. Final decisions by the Board in interference proceedings may be appealed to the Federal Circuit. *See* 35 U.S.C. § 141. Alternatively, a party dissatisfied with the Board's decision may commence a civil action against the other parties in interest in a federal district court. *See id.* § 146. These actions, known as "Section 146 proceedings," are essentially to review the action of the Board. *See Conservolite, Inc. v. Widmayer*, 21 F.3d 1098, 1102 (Fed. Cir. 1994). Section 146 authorizes the district court to accept new testimony, but normally only as to issues raised by the parties below or by the Board's decision. *See id.* A district court may, in appropriate circumstances, exercise its discretion and admit testimony on issues not raised before the Board. *See id.*

9. *See, e.g., Price v. Symsek*, 988 F.2d 1187, 1194 (Fed. Cir. 1993) (stating that "an inventor's testimony, standing alone, is insufficient to prove conception—some form of corroboration must be shown"); *Ganguly v. Sunagawa*, 5 U.S.P.Q.2d (BNA) 1970, 1973 (Bd. Pat. App. & Int. 1987) (holding that evidence of corroboration must not depend solely on the inventor).

The requirement for corroboration applies generally in all proceedings in which a party's date of invention is at issue, including § 146 actions. *See Estee Lauder Inc. v. L'Oreal S.A.*, 40 U.S.P.Q.2d (BNA) 1425, 1432 (D.D.C. 1996) (requiring corroboration for proof of an alleged actual reduction to practice in the form of "independent evidence separate from that of the inventor himself" (citing *Knorr v. Pearson*, 671 F.2d 1368, 1373 (C.C.P.A. 1982))), *rev'd*, 129 F.3d 588 (Fed. Cir. 1997). For example, in patent infringement actions, in which the validity of the patent is typically challenged, corroboration is required when the patentee seeks to establish a pre-filing date of invention in order to antedate prior art asserted by its opponent. *See, e.g., Loral Fairchild Corp. v. Victor Co. of Japan*, 931 F. Supp. 1014, 1031 (E.D.N.Y. 1996) (holding that the absence of corroborating evidence of diligence precludes the patentee's reliance on date of conception); *Ritter v. Rohm & Haas Co.*, 271 F. Supp. 313, 324 & n.27 (S.D.N.Y. 1967) (holding that the inventor's notebook was admissible to show corroboration of his reduction to practice). Similarly, an

corroboration requirement—which has been part of U.S. patent law for over a century¹⁰—continues to be applied by the Board and courts to prevent fraud.¹¹ In recent years, the Board and courts have adopted a “rule of reason” to ameliorate the harshness of a strict corroboration requirement.¹² Various types of evidence¹³ have been admitted by the Board and courts to corroborate inventors’ testimony,¹⁴ on the ground that “[a]n evaluation of *all* pertinent evidence must be made so that a sound determination of the credibility of the inventor’s story may

infringement defendant challenging a patent on the ground that the patented invention was first invented by a third party must corroborate the third party’s testimony regarding its invention date, if the third party is self-interested in the outcome. *See* Thompson, S.A. v. Quixote Corp., 166 F.3d 1172, 1176 (Fed. Cir. 1999) (holding that, in attempts to invalidate a patent based on evidence of third-party prior invention, “corroboration is required only when the testifying inventor is asserting a claim of derivation or priority of his or her invention and is named as a party, or otherwise is in a position” in which “he or she stands to directly and substantially gain by his or her invention being found to have priority over the patent claims at issue”); *see also* Graco Children’s Prods., Inc. v. Century Prods. Co., No. CIV.A.93-6710, 1996 WL 421966, at *23-24 (E.D. Pa. Jul. 23, 1996) (rejecting the defense of derivation under 35 U.S.C. § 102(f) because the defendant’s only evidence of prior invention was the uncorroborated testimony of the alleged prior inventor himself); Ralston Purina Co. v. Far-Mar-Co, Inc., 586 F. Supp. 1176, 1213 (D. Kan. 1984), *aff’d in part, rev’d in part*, 772 F.2d 1570 (Fed. Cir. 1985) (“Independent corroboration is not only required in order to obtain priority . . . in an interference, but is also required in order to establish a reduction to practice [under 35 U.S.C. § 102(g)] as prior art in order to invalidate a patent.”).

10. Refer to notes 137-38 *infra* and accompanying text (citing century-old case law that explained the need for corroboration).

11. *See generally* Reese v. Hurst, 661 F.2d 1222, 1226 & n.4 (C.C.P.A. 1981) (explaining that the basis of the corroboration rule is to prevent fraud in patent procurement); Horton v. Stevens, 7 U.S.P.Q.2d (BNA) 1245, 1247-48 (Bd. Pat. App. & Int. 1988) (stating that the purpose of the corroboration rule is to “prevent fraud and to establish, by proof that is unlikely to have been fabricated or falsified, that the inventor successfully reduced his invention to practice”).

12. *See Reese*, 661 F.2d at 1225 (noting that the “rule of reason” has eased corroboration requirements pertaining to the evidence necessary to establish the credibility of the inventor).

13. The Federal Circuit recently observed: “Corroborating evidence may take many forms. Often contemporaneous documents prepared by a putative inventor serve to corroborate an inventor’s testimony. Circumstantial evidence about the inventive process may also corroborate. Additionally, oral testimony of someone other than the alleged inventor may corroborate.” *Ethicon, Inc. v. United States Surgical Corp.*, 135 F.3d 1456, 1461 (Fed. Cir.) (citations omitted), *cert. denied*, 119 S. Ct. 278 (1998).

14. *See, e.g.*, Lacotte v. Thomas, 758 F.2d 611, 612-13 (Fed. Cir. 1985) (affirming the Board’s holding that the inventor’s procurement of supplies to practice the invention and the testimony of the inventor’s associate were sufficient corroboration in the context of an organized research program); *Nashef v. Pollock*, 4 U.S.P.Q.2d (BNA) 1631, 1636-37 (Bd. Pat. App. & Int. 1987) (finding the requisite corroboration in, *inter alia*, the testimony of the inventor’s research technician and the director of an independent laboratory regarding their testing of samples).

be reached."¹⁵ The rule of reason approach has been held to have particular value when applied to activities that were part of an organized program of research.¹⁶

In many instances, the critical evidence submitted to the Board or the district court on the issue of priority of invention comes from a researcher's laboratory notebook.¹⁷ Inventors have traditionally kept bound, paper research notebooks in which they detail their activities and thought processes.¹⁸ These records are customarily kept according to particular procedures designed to enhance their potential evidentiary value.¹⁹ However, researchers, like others, are increasingly relying on computers for record creation, data analysis, and storage.²⁰ The use of computer-generated evidence, or "electronic records,"²¹ in legal proceedings has raised issues concerning their reliability.²² These concerns are heightened for electronic records used to establish a date of invention in patent cases because of the strict evidentiary rules that apply.²³

15. Price v. Symsek, 988 F.2d 1187, 1195 (Fed. Cir. 1993).

16. See Berges v. Gottstein, 618 F.2d 771, 774-75 (C.C.P.A. 1980).

17. See, e.g., Kridl v. McCormick, 105 F.3d 1446, 1450-51 (Fed. Cir. 1997) (awarding priority based on corroboration provided by notes in a laboratory notebook); Bosies v. Benedict, 27 F.3d 539, 543-44 (Fed. Cir. 1994) (reversing the Board's priority determination involving a chemical compound having two carbon atoms in the group at issue because the laboratory notebook entry showed the number of carbon atoms only as the variable "n").

18. Refer to notes 236-38 *infra* and accompanying text (discussing the notebook's potential to protect researchers against future rival claims of invention and to help establish a date of invention).

19. Refer to notes 239-48 *infra* and accompanying text (detailing the procedures traditionally used to enhance reliability).

20. The potential advantages of electronic laboratory notebook systems include: (1) the facilitation of selective sharing of information among researchers; (2) the ability to index records for keyword searching or to search on a full-text basis; and (3) their capacity for accepting various information formats, such as text, drawings, chemical structures, circuit schematics, images (including photographs), graphs, and tables. See Raymond E. Dessy, *Electronic Lab Notebooks: A Shareable Resource*, 67 ANALYTICAL CHEMISTRY 428A, 428A-31A & fig.1 (1995).

21. The term "electronic records" as used herein includes records created and/or stored by a computer at some time prior to being offered as evidence in a legal proceeding, regardless of the nature of the storage medium employed and the form in which the record is offered (e.g., whether submitted as a computer printout or copy thereof, or as stored on disk, tape, or other non-paper medium).

22. Refer to notes 81-94 *infra* and accompanying text (discussing objections to the admissibility of electronic records).

23. See, e.g., *Franklin Pierce Law Center's Sixth Biennial Patent System Major Problems Conference*, 37 IDEA 623, 671 (1997). A number of authors have raised concerns over the use of electronic records to establish a date of invention. Patent attorney Robert Armitage states:

We now have, as I am sure all of you who advise clients on interference matters are aware, the peculiar situation where our clients no longer have those marvelous notarized witnessed paper records of invention that

The PTO's recent notice regarding the admissibility of electronic records in patent interferences partially alleviates these concerns. The notice states:

Pursuant to 37 CFR § 1.671, electronic records are admissible as evidence in interferences before the Board of Patent Appeals and Interferences to the same extent that electronic records are admissible under the Federal Rules of Evidence. The weight to be given any particular record necessarily must be determined on a case-by-case basis.²⁴

By expressly providing for the admissibility of electronic research records in interferences, the notice addresses, to a certain extent, the concerns that have been voiced regarding whether such records can be used to prove invention dates.²⁵ The proponent of a particular electronic record need only satisfy the requirements of the Federal Rules of Evidence in order to have the record admitted into evidence.²⁶ Those requirements, as the

demonstrate conception. They all do this electronically and now are worried about exotic systems for authenticating and verifying electronic dates of invention.

Id. Another commentator has noted:

You need to establish who invented [an invention] and at what date they invented it. So, typically, patent attorneys will tell their clients to keep notebooks that are signed and witnessed so that the dates on which the client conceived certain facts are documented.

Well, if all this stuff is taking place through e-mail on a network, how do you do that? Some procedure would have to be put in place to collect these ideas and somehow validate them, witness them, and date them. I don't know what that is, but I'm sure someone will come up with a product that they will be vending soon.

Eduardo M. Carreras, *Intellectual Property: First Casualty on the Information Highway?*, ACCA DOCKET, Jan.-Feb. 1995, at 26, 36. In addition, another commentator has stated:

Electronic data storage, without the wasteful duplication of an additional paper storage system, has the potential to save research institutions a great deal of money. Yet, . . . under the present interference system no one currently knows 'exactly how the major corporation is to prove a date of invention with such an electronic system'

Charles R.B. Macedo, *First-To-File: Is American Adoption of the International Standard in Patent Law Worth the Price?*, 18 AIPLA Q. J. 193, 219 (1990) (quoting Harold C. Wegner, *Patent Law Simplification and the Geneva Patent Convention*, 14 AIPLA Q. J. 154, 188-89 (1986)); see also Victoria McNamara, *New Computer Bulletin Board Lets Baylor Scientists Brainstorm Ideas*, HOUSTON BUS. J., Nov. 19, 1990, at 4, 5 ("[S]ome chemical and pharmaceutical companies have questioned the legal strength of computer notes vs. handwritten notes traditionally read and signed by colleagues when inventions and patents are challenged.").

24. PTO NOTICE, *supra* note 2, at 14.

25. Refer to note 23 *supra* (detailing different commentators' concerns regarding the use of electronic records to prove invention dates).

26. It should be noted that PTO interference rules already expressly provide that the Federal Rules of Evidence apply to interference proceedings. See 37 C.F.R. §

federal courts have applied them, do not present a significant obstacle.²⁷ However, admissibility is only part of the evidentiary challenge, particularly for a party seeking to prove a date of invention. The proponent must also persuade the fact-finder that the records are credible, and provide corroborating proof for any records that emanate solely from an inventor.²⁸

This Article discusses the use of electronic records to establish a date of invention in patent cases. Part II discusses the characteristics of electronic records that make them potentially susceptible to evidentiary challenge. Part III discusses the federal courts' treatment of electronic records under the Federal Rules of Evidence, because the PTO notice makes explicit the applicability of those rules to electronic records in interferences, and because the policies underlying the rules governing the use of documentary evidence in federal litigation are essentially the same as those that form the basis for the strict evidentiary rules governing proof of inventive activity. Part IV explains the evidentiary requirements governing proof of invention in patent cases. Finally, Part V specifically considers the use of electronic records to prove dates of invention. Recommendations for creating and maintaining electronic records are offered, and implications for the use of electronic records, as compared with paper records, are discussed in the context of hypothetical scenarios.

II. ATTRIBUTES OF ELECTRONIC RECORDS

Questions concerning the evidentiary sufficiency of electronic records arise from the attributes of electronic records that distinguish them from traditional paper records.²⁹ To see

1.671(b) (1998). Furthermore, the Board has made admissibility determinations in interferences under various provisions of the rules. *See, e.g.,* *English v. Ausnit*, 38 U.S.P.Q.2d (BNA) 1625, 1629-30 (Bd. Pat. App. & Int. 1993) (rejecting a challenge to a redacted copy as failing to meet the requirements of FED. R. EVID. 1001(4)); *Ernsthausen v. Nakayama*, 1 U.S.P.Q.2d (BNA) 1539, 1542 (Bd. Pat. App. & Int. 1985) (considering a party's motion to exclude documentary evidence pursuant to FED. R. EVID. 802). Hence, the Federal Rules presumably already apply to determinations regarding the admissibility of electronic records in interference proceedings. Thus, the issuance of a specific PTO notice expressly authorizing the admission of electronic records into evidence reflects the singular importance of the issue to potential interference litigants.

27. Refer to Part III *infra* (discussing how electronic records are regularly held admissible).

28. Refer to Part IV.B *infra*.

29. *See generally* Rudolph J. Peritz, *Computer Data and Reliability: A Call for Authentication of Business Records Under the Federal Rules of Evidence*, 80 NW. U. L. REV. 956, 964-66 (1986); Note, *Appropriate Foundation Requirements for Admitting Computer Printouts into Evidence*, 1977 WASH. U. L.Q. 59, 73-75

why, it is necessary to consider the process of creation and storage of electronic records.

In general,³⁰ the process of creating an electronic record begins with data capture via an input device—either one operated by a human, such as a computer keyboard, mouse, or light pen, or an automated source, such as a modem or network connection.³¹ Once in the computer, information is generally held in some type of temporary (or “primary”) memory³² until it is saved in a more permanent (or “secondary”) memory device,³³ such as a computer’s “hard drive,” magnetic disks or tapes, or optical storage devices. Information may be transmitted through computer modems or across networks for purposes of data processing, sharing, or storage.³⁴ Finally, for use in federal court, electronic records must be identified, located, retrieved from storage, and printed on paper.³⁵

This process presents opportunities for data loss or corruption. For example, each of the manipulations described is controlled by computer software, which may include “bugs” that can undermine process reliability.³⁶ At least while records are magnetically stored they are subject to change through intentional tampering or innocent error,³⁷ and if old information is overwritten with new, such changes may be difficult to detect.³⁸

(describing the input, memory, control, arithmetic, and output functions of a computer and how computer records differ from traditional paper records).

30. Information management technology is complex, and it continues to develop and evolve. This general description is provided only as an example for purposes of illustrating some of the attributes of electronic records that may raise evidentiary issues.

31. See CHARLES S. PARKER, *UNDERSTANDING COMPUTER AND INFORMATION PROCESSING* 136-39, 159-63 (4th ed. 1992) (describing in detail each type of input device).

32. See *id.* at 13.

33. See *id.*

34. See Charles R. Merrill, *A Practical Guide for Legal Counsel on Mitigation of Risk From Electronic Records* (visited Apr. 16, 1999) <<http://www.surety.com>> (identifying the advantages of using computers to “store, access, and communicate information in magnetic, electronic, or optional formats”). This source can be located on the Web site under “Site Map: Legal Guide.”

35. See, e.g., *United States v. Hernandez*, 913 F.2d 1506, 1512-13 (10th Cir. 1990) (holding electronic records that had been retrieved and printed on paper admissible).

36. See *United States v. Weatherspoon*, 581 F.2d 595, 598 (7th Cir. 1978) (admitting into evidence computer records based, in part, on the government’s showing that the computer was regularly tested for internal programming errors).

37. See Committee on Computer Law of the Association of the Bar of the City of New York, *Admissibility of Documents Reproduced Using Electronic Data Imaging: A Proposal to Amend Rule 4539 of the New York Civil Procedure Law and Rules*, 49 *THE RECORD* 339, 345 (1994) (noting the vulnerability of magnetic media to damage from magnetic fields and to selective erasure). “Write Once-Read Many”

As discussed below, parties opposing the admission of electronic records in judicial proceedings have relied upon these and other potential corruption opportunities inherent in the creation and storage process.³⁹ Generally, courts have declined to base admissibility determinations on the potential unreliability of electronic records; instead, consistent with their treatment of paper records, courts have required proof that particular records are suspect because of irregularities that occurred in the creation or storage process.⁴⁰

III. ADMISSIBILITY OF ELECTRONIC RECORDS IN FEDERAL COURT LITIGATION

It is appropriate to first consider the use of electronic records as evidence in federal court proceedings, because the Federal Rules of Evidence apply generally in interference proceedings⁴¹ and specifically to the admissibility of electronic records.⁴² In addition, the federal courts have over two decades experience⁴³

("WORM") optical disk technology offers security and stability advantages over magnetic storage technology in this regard. See Richard Raysman & Peter Brown, *The New Technology for Storing Business Records*, N.Y.L.J., Aug. 9, 1994, at 3 (explaining that once information is stored on a WORM disk, it cannot be altered).

38. According to Charles N. Faerber, National Notary Association Vice President, speaking at the August 9, 1992 meeting of the American Bar Association's Electronic Data Interchange and Information Technology Division, "any technological development can be subverted. . . and the more sophisticated the technology, the more difficult it is to detect subversion." *Electronic Documents Will Expand Notary's Role, American Bar Panel Told*, DAILY RECORD (Rochester), Sept. 9, 1992, at 1.

39. Refer to notes 81-94 *infra* and accompanying text.

40. See, e.g., *Potamkin Cadillac Corp. v. B.R.I. Coverage Corp.*, 38 F.3d 627, 632-33 (2d Cir. 1994) (refusing admission based on the presence of errors in the record).

41. See 37 C.F.R. § 1.671(b) (1998).

42. See PTO NOTICE, *supra* note 2, at 14. The Board and courts have routinely applied the business records exception to admit documentary evidence of inventive activity, despite some confusing statements to the contrary in older cases. Refer to notes 160-61 *infra* and accompanying text.

43. The Federal Rules of Evidence were enacted in 1975. See Act to Establish Federal Rules of Evidence, Pub. L. No. 93-595, 88 Stat. 1926 (1974). Both Rule 901(b)(8), relating to the authentication requirement, and Rule 803(6), the hearsay exception for "[r]ecords of regularly conducted activity," for example, specifically contemplate the use of "data compilation[s]" as evidence in the federal courts. See FED. R. EVID. 901(8); FED. R. EVID. 803(6). According to the Advisory Committee Note to Rule 901(b)(8), documents that may be authenticated include "data stored electronically or by other similar means." FED. RULE EVID. 901(b)(8) advisory committee's note. Early cases interpreting these provisions include *United States v. Weatherspoon*, 581 F.2d 595, 598 (7th Cir. 1978) (rejecting the defendant's claim that insufficient foundation was laid for the admission of computer printouts), and *Rosenberg v. Collins*, 624 F.2d 659, 665 (5th Cir. 1980) (holding computer business records admissible under FED. R. EVID. 803(6)).

considering the application of those rules to electronic records⁴⁴ and ruling on objections to their admissibility.⁴⁵ Furthermore, the rationales underlying the admissibility of documentary evidence under the Federal Rules of Evidence and the policy behind the rules governing the corroboration of proof of invention are closely related. Thus, the evidentiary treatment that these records have received in the federal courts should guide the Board—and district courts in Section 146 actions—in evaluating the sufficiency of electronic records offered as evidence in interference proceedings.

A. *Evidentiary Rules Applicable to Electronic Record Evidence in Federal Judicial Proceedings*

Determining whether a given record, portion of testimony, or other evidence a party offers is admissible involves consideration of a series of underlying requirements, each of which must be satisfied before the evidence will be admitted. First, the evidence must be relevant to the issues to be determined in the proceeding.⁴⁶ Evidence is relevant if it tends to prove or disprove any fact “of consequence to the determination of the action.”⁴⁷ Trial judges have broad discretion to determine whether particular evidence is relevant.⁴⁸

A second, threshold requirement for the admissibility of non-testimonial evidence is the requirement of authentication.⁴⁹ The proponent must establish that the evidence is what it is claimed to be.⁵⁰ Typically, a record is authenticated through the testimony of a witness who can identify the record as, for example, a record of a particular transaction or business.⁵¹ Authentication testimony is part of the “foundation” that must be laid for the introduction of a record in federal court.⁵² Electronic records may

44. Refer to Part III *infra*.

45. Refer to Part III.B.2 *infra*.

46. See FED. R. EVID. 402.

47. FED. R. EVID. 401.

48. See, e.g., *Hamling v. United States*, 418 U.S. 87, 124-25 (1974) (stating that the relevance of testimony is left largely to the discretion of the trial court that hears the evidence); *United States v. Grant*, 967 F.2d 81, 83 (2d Cir. 1992) (affording the trial judge broad discretion in making relevancy determinations).

49. See FED. R. EVID. 901(a).

50. See *id.*

51. See, e.g., *United States v. Lai*, Nos. 92-10732, 92-10733, 1995 WL 444663, at *1-2 (9th Cir. July 26, 1995) (affirming the admission of documents authenticated via testimony regarding the record-keeping method, including the testimony of those who designed and implemented the procedures and of those who taught the accounting method).

52. See *Brown v. Town of Chapel Hill, North Carolina*, No. 95-1247, 1996 WL

be authenticated as a "data compilation,"⁵³ or as the output of "a process or system used to produce a result."⁵⁴

To be admitted into evidence, electronic records must be relevant⁵⁵ and authenticated.⁵⁶ However, the most significant admissibility hurdle to overcome, assuming electronic records are offered to prove the truth of the matters they assert, is the hearsay exclusion.⁵⁷ These records, whether offered as computer printouts or on electronic media, contain statements made out of court by persons whose memory, perception, sincerity, and narration of the subject information cannot be evaluated as of the time the statements were made.⁵⁸ Thus, they are objectionable because the party opposing admission cannot cross-examine the maker of the statement.⁵⁹

Because of the need for relevant evidence in court proceedings,⁶⁰ and because much of what would be excluded by the hearsay rule is sufficiently trustworthy,⁶¹ a number of exceptions to the hearsay rule have been developed and codified in the Federal Rules of Evidence.⁶² Several of these exceptions are potentially

119932, at *3 (4th Cir. Mar. 19, 1996) (rejecting a challenge to the authenticity of computer printouts and stating, "[p]rovided a proper foundation is laid, computer-generated evidence is no less reliable than original entry books and should be admitted under the exception" (alteration in original) (quoting CHARLES TILFORD MCCORMICK, MCCORMICK ON EVIDENCE § 294 (John William Strong ed., 4th ed. 1992))).

53. See FED. R. EVID. 901(b)(8) (discussing the steps necessary to authenticate data compilations in order to establish admissibility).

54. See FED. R. EVID. 901(b)(9) (noting that the "process or system" method of authentication further requires evidence of an accurate result).

55. See FED. R. EVID. 402; see also *United States v. Smith*, 973 F.2d 603, 605 (8th Cir. 1992) (holding that a police department crime report printout met the relevance requirement and, thus, was correctly admitted under the public record exception to the hearsay rule).

56. See FED. R. EVID. 901(a); see also *First Nat'l Bank v. M/V Lightning Power*, 851 F.2d 1543, 1548 (5th Cir. 1988) (affirming the district court's refusal to award damages based only on an unauthenticated computer printout).

57. See FED. R. EVID. 802; see also FED. R. EVID. 801(c) (defining hearsay as a "statement, other than one made by the declarant while testifying at the trial or hearing, offered in evidence to prove the truth of the matter asserted").

58. See, e.g., *Moss v. Ole S. Real Estate, Inc.*, 933 F.2d 1300, 1308 (5th Cir. 1991) (identifying the principle hearsay dangers).

59. See, e.g., *Anderson v. United States*, 417 U.S. 211, 220 (1974) (explaining that the primary justification for excluding hearsay is the inability of the adversary to cross-examine the declarant); *United States v. Dennis*, 625 F.2d 782, 795 (8th Cir. 1980) (stating that "courts will not admit . . . hearsay, because its accuracy and trustworthiness cannot be tested by confrontation and cross-examination").

60. See FED. R. EVID. 402.

61. See, e.g., MCCORMICK, *supra* note 52, § 286 (observing that the hearsay exception for regularly kept records is justified based on a high degree of reliability and accuracy).

62. See FED. R. EVID. 803 (describing the hearsay exceptions when the availability of the declarant is immaterial); see also FED. R. EVID. 804 (outlining the hearsay exceptions that require the unavailability of the declarant).

relevant to the admission of electronic records into evidence.⁶³ For example, electronic records of reports of public offices and agencies concerning the office's activities, "matters observed pursuant to duty imposed by law as to which . . . there was a duty to report," and fact findings made during an official investigation are admissible despite being made out of court.⁶⁴ An exception also exists for records of regularly conducted activities.⁶⁵ Specifically, a record that reports "acts, events, conditions, opinions, or diagnoses" is admissible if: (1) made by or from information obtained from a person having knowledge of the subject information; (2) "at or near the time" thereof; and (3) the record was kept "in the course of a regularly conducted business activity," in which "it was the regular practice of that business activity to make the . . . record, . . . unless the source of information or the method or circumstances of preparation indicate lack of trustworthiness."⁶⁶

Depending upon the origin of the electronic record in question, a "best evidence" objection may also be made to its admission. Generally, an original writing or recording⁶⁷ is required to prove the

63. In addition to the specific exceptions discussed here, Rules 803(24) and 804(b)(5) authorize the admission of

[a] statement not specifically covered by any of the foregoing exceptions but having equivalent circumstantial guarantees of trustworthiness, if the court determines that (A) the statement is offered as evidence of a material fact; (B) the statement is more probative on the point for which it is offered than any other evidence which the proponent can procure through reasonable efforts; and (C) the general purposes of these rules and the interests of justice will best be served by the admission of the statement into evidence.

FED. R. EVID. 803(24); FED. R. EVID. 804(b)(5). These provisions were intended to accommodate unanticipated situations. See FED. R. EVID. 803(24) advisory committee's note. Electronic records may, therefore, be admitted pursuant to these provisions when the other exceptions do not apply. Rules 803(24) and 804(b)(5) cover situations in which the declarant's availability is immaterial, and the declarant is unavailable, respectively.

64. FED. R. EVID. 803(8).

65. See FED. R. EVID. 803(6).

66. *Id.* This rule is commonly known as the "business records exception" to the hearsay rule, although, technically, evidence that falls within the categories delineated in Rule 803 is not excluded by the hearsay rule and, therefore, no exception to the rule is necessary. See FED. R. EVID. 803 ("The following are not excluded by the hearsay rule . . ."). Note, however, that the term "business" is broadly defined as including "business, institution, association, profession, occupation, and calling of every kind, whether or not conducted for profit." FED. R. EVID. 803(6).

The Court of Appeals for the Seventh Circuit has described the rationale underlying the business records exception as follows: "First, businesses depend on such records to conduct their own affairs; accordingly, the employees who generate them have a strong motive to be accurate and none to be deceitful. Second, routine and habitual patterns of creation lend reliability to business records." *United States v. Blackburn*, 992 F.2d 666, 670 (7th Cir. 1993).

67. For purposes of the best evidence rule, "[w]ritings' and 'recordings' consist of letters, words, or numbers, or their equivalent, set down by handwriting,

contents of the writing or recording in federal court.⁶⁸ However, computer printouts and other sight-readable computer outputs are regarded as originals “[i]f data are stored in a computer or similar device” and the outputs are “shown to reflect the data accurately.”⁶⁹ On the other hand, if an electronic record is prepared from an existing paper record, for example, when information from a paper record is entered by hand or electronically by scanning or faxing the information into computer memory, the electronic record could be considered a duplicate.⁷⁰ Even a duplicate is admissible—“to the same extent as an original”—unless the authenticity of the original is questionable or “it would be unfair to admit the duplicate in lieu of the original.”⁷¹ Thus, even if an electronic record is a duplicate for purposes of the best evidence rule, the proponent presumably will not need to lay more foundation for its admission under the best-evidence rule than will already be required for purposes of authenticating the record⁷² and overcoming the hearsay rule.⁷³

B. Federal Court Determinations on the Admissibility of Electronic Records

Applying the evidentiary rules set forth above, the federal courts have regularly admitted electronic records into evidence upon the laying of a proper foundation and have done so over various objections to admissibility.

typewriting, printing, photostating, photographing, magnetic impulse, mechanical or electronic recording, or other form of data compilation.” FED. R. EVID. 1001(1).

68. See FED. R. EVID. 1002. “The purpose of the best evidence rule is to prevent inaccuracy and fraud when [a party] attempt[s] to prove the contents of a writing.” *United States v. Ross*, 33 F.3d 1507, 1513 (11th Cir. 1994) (citing FED. R. EVID. 1001 advisory committee’s note). As codified in the Federal Rules of Evidence, however, the rule is one of preference. See, e.g., FED. R. EVID. 1004 advisory committee’s note (stating that “the rule requiring the production of the original as proof of contents has developed as a rule of preference: if failure to produce the original is satisfactorily explained, secondary evidence is admissible”).

69. FED. R. EVID. 1001(3).

70. See FED. R. EVID. 1001(4).

71. FED. R. EVID. 1003.

72. Refer to notes 49-54 *supra* and accompanying text (explaining the authentication process for electronic records in order to establish admissibility).

73. Refer to notes 55-66 *supra* and accompanying text (reviewing the requirements of relevance, authentication, and non-hearsay that must be met in order to have electronic records admitted into evidence).

The rules further provide that summaries of “voluminous writings, recordings, or photographs which cannot conveniently be examined in court may be presented in the form of a chart, summary, or calculation.” FED. R. EVID. 1006. Thus, electronic records may, in some circumstances, qualify for admission as summaries, assuming the other requirements of relevance, authentication, and non-hearsay are met. Refer to notes 46-66 *supra* and accompanying text. The underlying original records must be available for inspection and/or copying by the other parties. See FED. R. EVID. 1006.

1. *Foundation Required for Electronic Records.* As with other business records, electronic records are not admissible unless the proponent has established a proper foundation in the record for their introduction.⁷⁴ A foundation for the admission of an electronic record is laid by establishing that a particular electronic record was

made at or near the time by, or from information transmitted by, a person with knowledge, . . . kept in the course of a regularly conducted business activity, and [made as part of] . . . the regular practice of that business activity. . . , as shown by the testimony of the custodian or other qualified witness⁷⁶

Although the process by which electronic records are created, stored, and retrieved is complex, courts have not required that foundation testimony⁷⁶ be presented by a computer programmer.⁷⁷ The witness need not be the person who actually created the record,⁷⁸ nor does the witness have to attest to the accuracy of the information in the record.⁷⁹ All that is required is

74. See *United States v. Cestnik*, 36 F.3d 904, 909 (10th Cir. 1994) (upholding the district court's finding that a proper foundation for the admission of Western Union money transfer records was provided by the testimony of the records' custodian regarding their creation in the normal course of Western Union's business).

75. *United States v. Moore*, 923 F.2d 910, 914 (1st Cir. 1991) (alteration in original) (citing FED. R. EVID. 803(6)). Other circuit courts of appeal have adopted a different articulation of the foundation requirement. See, e.g., *United States v. Hernandez*, 913 F.2d 1506, 1512 (10th Cir. 1990) ("Computer business records are admissible if (1) they are kept pursuant to a routine procedure designed to assure their accuracy, (2) they are created for motives that tend to assure accuracy (e.g., not including those prepared for litigation), and (3) they are not themselves mere accumulations of hearsay." (quoting *Capital Marine Supply, Inc. v. M/V Roland Thomas, II*, 719 F.2d 104, 106 (5th Cir. 1983))).

76. The Judicial Conference's Advisory Committee on the Federal Rules of Evidence has proposed amending Rule 803(6) to provide for the authentication of certain business records other than through the testimony of foundation witnesses. See *Preliminary Draft of Proposed Amendments to the Federal Rules of Practice and Procedure: A Summary for Bench and Bar* (August 1998) <<http://www.uscourts.gov/review/cvev98.htm>>.

77. See *United States v. Linn*, 880 F.2d 209, 216 (9th Cir. 1989) (noting that Rule 803(6) requires only that the writing be made by a person with *personal knowledge* of the electronic recording, at or near the time of the recording, and that the record is kept in the ordinary course of business).

78. See, e.g., *Moore*, 923 F.2d at 915 (quoting *Wallace Motor Sales, Inc. v. American Motor Sales Corp.*, 780 F.2d 1049, 1060-61 (1st Cir. 1985)); *Midfirst Bank, SSB v. C.W. Haynes & Co.*, 893 F. Supp. 1304, 1311 (D.S.C. 1994) ("Obviously, such a requirement would eviscerate the business records exception, since no document could be admitted unless the preparer (and possibly others involved in the information-gathering process) personally testified as to its creation." (quoting *United States v. Keplinger*, 776 F.2d 678, 693-94 (7th Cir. 1985))).

79. See, e.g., *United States v. Whitaker*, 127 F.3d 595, 601 (7th Cir. 1997) (rejecting defendant's argument that computer records were inadmissible because no

that the witness have knowledge of how the records were compiled and kept.⁸⁰

2. *Objections to the Admissibility of Electronic Records.* In addition to objections based on the qualifications of the foundation witness,⁸¹ parties opposing admission have objected because: (1) the printout offered into evidence was prepared for purposes of the litigation;⁸² (2) the computer used to create or store the electronic record has not been shown to be error-free;⁸³ (3) it is possible to change data stored in computer memory;⁸⁴ and (4) errors may have occurred during the data input process.⁸⁵ In general, however, these objections have not succeeded.

Generally, documents created for the purpose of litigation are not admissible,⁸⁶ as they are "dripping with motivations to misrepresent."⁸⁷ Courts distinguish, however, between records whose content was created for the purpose of litigation and printouts created at the time of litigation of records prepared in the ordinary course of business.⁸⁸ Thus, the federal courts have admitted electronic records even when the printouts of those records actually offered for admission did not exist prior to the litigation.⁸⁹ Courts have recognized that restricting admissibility

witness testified to the "accuracy of the input to and output from the computer"), *cert. denied*, 118 S. Ct. 1098 (1998); *Wilson v. Zapata Off-Shore Co.*, 939 F.2d 260, 272 (5th Cir. 1991) (noting that Rule 803(6) does not require testimony that the record is accurate).

80. See *United States v. Goodchild*, 25 F.3d 55, 62 (1st Cir. 1994) (explaining that the witness was qualified to testify about account records because he could testify to the procedures used in creating the records); see also *Moore*, 923 F.2d at 914 (noting that the head of computer loans at the Bank was a "qualified witness" because of his knowledge of how loan data are compiled and collected).

81. Refer to notes 76-80 *supra* and accompanying text.

82. Refer to notes 86-91 *infra* and accompanying text.

83. Refer to notes 92-94 *infra* and accompanying text.

84. Refer to note 95 *infra* and accompanying text.

85. Refer to note 96 *infra* and accompanying text.

86. See, e.g., *Palmer v. Hoffman*, 318 U.S. 109, 114 (1943) (upholding a refusal to admit railroad accident reports whose "primary utility is in litigating, not in railroading"); *Potamkin Cadillac Corp. v. B.R.I. Coverage Corp.*, 38 F.3d 627, 632 (2d Cir. 1994) (holding that an accounting history would not be admitted because it constituted attorney work product and noting that "[d]ata prepared or compiled for use in litigation are not admissible as business records").

87. *Hoffman v. Palmer*, 129 F.2d 976, 991 (2d Cir. 1942), *aff'd*, 318 U.S. 109, 114 (1943).

88. See, e.g., *United States v. Sanders*, 749 F.2d 195, 198 (5th Cir. 1984) (distinguishing computer printouts prepared for litigation from the data therein, which was maintained for business purposes).

89. See *United States v. Ross*, 33 F.3d 1507, 1517 n.17 (11th Cir. 1994) (upholding the admission of computer printouts prepared for the purpose of litigation (citing *United States v. Hernandez*, 913 F.2d 1506, 1512-13 (10th Cir. 1990) (stating that "so long as the original computer data compilation was prepared

to records printed at the time of the event in question “would restrict the admissibility of computerized records too severely”⁸⁹ and would frustrate the principle objectives for keeping records in electronic form, including convenience, reduction in storage space, and cost savings.⁹¹

Courts have not required a showing that the computers used to generate electronic records contain no programming errors.⁹² Evidence that the computers involved were regularly tested to ensure reliability may be used to bolster the accuracy of the records in question,⁹³ but such evidence has generally not been treated as a prerequisite to admissibility.⁹⁴

In responding to these objections, some courts have drawn a line between requirements for admissibility and factors influencing the credibility or weight of the evidence. For example, concerns regarding the possibility of data manipulation have been held to affect only the weight of the evidence, not its admissibility.⁹⁵ Similarly, electronic record evidence has been

pursuant to a business duty in accordance with regular business practice, the fact that the hard copy offered as evidence was printed for purposes of litigation does not affect its admissibility”)); *see also* *United States v. Briscoe*, 896 F.2d 1476, 1494 n.13 (7th Cir. 1990) (holding that computer printouts prepared specifically for the case were admissible when the data compiled in the printouts was entered into the computer contemporaneously with the events recorded and maintained in the regular course of business).

90. *United States v. Russo*, 480 F.2d 1228, 1240 (6th Cir. 1973) (recognizing that computer printouts can be admitted into evidence even if they were not printed at the time of the act or transaction).

91. *See, e.g., id.* at 1239 (“[N]o court could fail to notice the extent to which businesses today depend on computers for a myriad of functions. Perhaps the greatest utility of a computer in the business world is its ability to store large quantities of information which may be quickly retrieved on a selective basis.”).

92. *See, e.g., United States v. Layne*, Nos. 93-1460, 93-1461, 1994 WL 142813, at *5 (6th Cir. April 19, 1994) (specifying that in the absence of contrary evidence, there is a presumption that the computer is functioning); *United States v. Moore*, 923 F.2d 910, 915 (1st Cir. 1991) (declaring that “it is not required that computers be tested for programming errors before computer records can be admitted under Fed. R. Evid. 803(6)”).

93. *See United States v. Weatherspoon*, 581 F.2d 595, 598 (7th Cir. 1978) (observing that the proponent of computerized printouts offered evidence regarding the monthly testing of the computer for programming errors to demonstrate the printouts’ reliability).

94. *See, e.g., Briscoe*, 896 F.2d at 1494-95 (explaining that a party advocating the admission of computer records is not required to establish that the computers were tested for internal programming errors as long as there are sufficient facts to show that the records are trustworthy and the opposing party has the opportunity to inquire into their accuracy).

95. *See, e.g., United States v. Bonallo*, 858 F.2d 1427, 1436 (9th Cir. 1988) (noting that the possibility that records can be altered merely goes to the weight of the evidence and is not enough to establish untrustworthiness); *United States v. Glasser*, 773 F.2d 1553, 1559 (11th Cir. 1985) (“The existence of an air-tight security system is not . . . a prerequisite to the admissibility of computer printouts. If such a

admitted despite the possibility that the information input process may have included errors, although the trier of fact is free to consider this possibility in evaluating the credibility of the evidence.⁹⁶

If the Board, in implementing the PTO notice regarding the admissibility of electronic records in interference proceedings, follows the lead of the federal courts,⁹⁷ admissibility should not be a significant impediment for litigants trying to prove a date of invention. Still, in a particular case, concerns about reliability may rise to a level in which they preclude admissibility.⁹⁸ Furthermore, if a record's credibility is significantly undermined by reliability concerns, it may be a small comfort to the proponent that the record was admitted.⁹⁹ For example, the PTO notice regarding the admissibility of electronic records in interferences makes explicit that "[t]he weight to be given any particular record necessarily must be determined on a case-by-case basis."¹⁰⁰ Furthermore, in interference proceedings, the weight that evidence is accorded has special significance because of the strict evidentiary requirements that apply.¹⁰¹

prerequisite did exist, it would become virtually impossible to admit computer generated records . . .").

96. See *United States v. Catabran*, 836 F.2d 453, 458 (9th Cir. 1988) (reasoning that even though inaccuracies may exist in computer printouts, these errors would affect the evidentiary weight afforded the records and not their admissibility).

97. Refer to notes 74-96 *supra* and accompanying text (detailing the foundation required for electronic records in federal court).

98. See, e.g., *Monotype Corp. v. International Typeface Corp.*, 43 F.3d 443, 450 (9th Cir. 1994) (holding a printout of an e-mail transmission inadmissible on the basis that "E-mail is far less of a systematic business activity than a monthly inventory printout . . . [and not] a regular, systematic function of a bookkeeper prepared in the course of business"); *Potamkin Cadillac Corp. v. B.R.I. Coverage Corp.*, 38 F.3d 627, 632-33 (2d Cir. 1994) (finding that errors in a computer-generated financial accounting history suggested that the document was not a business record and, therefore, was inadmissible); *United States v. Ferber*, 966 F. Supp. 90, 98-99 (D. Mass. 1997) (refusing to admit an e-mail message under Rule 803(6), the hearsay exception, because the government could not prove that the business required the maintenance of such records).

99. See, e.g., Carlo D'Angelo, *The Snoop Doggy Dogg Trial: A Look at How Computer Animation Will Impact Litigation in the Next Century*, 32 U.S.F. L. REV. 561, 579 (1998) ("In addition to issues of admissibility, counsel should also be concerned with the credibility of the exhibit.").

100. PTO NOTICE, *supra* note 2, at 14.

101. Refer to Part IV.B *infra* (describing the corroboration requirement in interference proceedings). See, e.g., *Reese v. Hurst*, 661 F.2d 1222, 1231 (C.C.P.A. 1981) ("The inventors' notebooks are accorded no more weight than the inventors' testimony in this instance, since they were not witnessed or signed and were unseen by any witness until after this interference was declared."); *Alpert v. Slatin*, 305 F.2d 891, 896 (C.C.P.A. 1962) (holding that "even accepting the weekly progress reports as a proper exception to the hearsay rule, their weight as corroborative evidence is no more than can be accorded to any other self-serving written

IV. ELECTRONIC EVIDENCE IN PATENT INTERFERENCE PROCEEDINGS

A. Overview of Interference Proceedings

If “[n]ecessity is the mother of invention,”¹⁰² then it is not surprising that an invention is sometimes made by more than one inventor or group of inventors¹⁰³ at approximately the same time. In such circumstances, most foreign countries simply award the patent on the invention to the first party to file a patent application.¹⁰⁴ In contrast, the United States grants the patent to the first party to make a particular invention.¹⁰⁵ As a result, it is sometimes necessary to determine priority of invention as between two or more patent claimants. This determination is made in a patent interference proceeding, an *inter partes* proceeding conducted in the PTO to decide which of two or more

document”); *Halbert v. Schuurs*, 220 U.S.P.Q. (BNA) 558, 561 (Bd. Pat. Int. 1983) (explaining that “corroboration goes to the weight to be accorded the evidence in question, not its admissibility”). Refer to Part IV.B.2 *infra* (discussing the distinction between corroboration and admissibility).

102. JOHN BARTLETT, *FAMILIAR QUOTATIONS* 134 (Emily Morison Beck ed., 15th ed. 1980).

103. Under U.S. patent law, patents can be granted to individual inventors or to “two or more persons jointly.” See 35 U.S.C. § 116 (Supp. II 1994). The District Court for the District of Columbia has defined joint inventorship as follows:

A joint invention is the product of collaboration of the inventive endeavors of two or more persons working toward the same end and producing an invention by their aggregate efforts. To constitute a joint invention, it is necessary that each of the inventors work on the same subject matter and make some contribution to the inventive thought and to the final result. Each needs to perform but a part of the task if an invention emerges from all of the steps taken together. It is not necessary that the entire inventive concept should occur to each of the joint inventors, or that the two should physically work on the project together. One may take a step at one time, the other an approach at different times. One may do more of the experimental work while the other makes suggestions from time to time. The fact that each of the inventors plays a different role and that the contribution of one may not be as great as that of another, does not detract from the fact that the invention is joint, if each makes some original contribution, though partial, to the final solution of the problem.

Monsanto Co. v. Kamp, 269 F. Supp. 818, 824 (D.D.C. 1967).

104. See Christian J. Garascia, Note, *Evidence of Conception in U.S. Patent Interference Practice: Proving Who is the First and True Inventor*, 73 U. DET. MERCY L. REV. 717, 721 (1996). Such regimes are aptly designated “first-to-file” systems. See, e.g., Charles R.B. Macedo, Note, *First-To-File: Is American Adoption of the International Standard in Patent Law Worth the Price?*, 1988 COLUM. BUS. L. REV. 543, 545.

105. See 35 U.S.C. § 102(g) (1994); see also *Paulik v. Rizkalla*, 760 F.2d 1270, 1272 (Fed. Cir. 1985). The United States thus employs a “first-to-invent” priority system. See, e.g., Michael N. Meller, *Planning for a Global Patent System*, 80 J. PAT. [& TRADEMARK] OFF. SOC’Y 379, 386 (1998).

parties claiming to have made a particular invention¹⁰⁶ was first in time.¹⁰⁷ The prior inventor, assuming all other questions of patentability have been resolved in his or her favor, is awarded the patent.¹⁰⁸

The legal definition of making an invention has two aspects: conception and reduction to practice.¹⁰⁹ Both aspects are considered for purposes of determining which inventor was prior.¹¹⁰

Conception is the mental aspect of inventing¹¹¹—the formation “in the mind of the inventor of a *definite and permanent idea of the complete and operative invention, as it is thereafter to be applied in practice . . .*”¹¹² Once conception has occurred, the invention may be constructed through the exercise of routine skill in the field to which the invention pertains.¹¹³

Reduction to practice involves a physical act—either constructing the invention and demonstrating that it works,¹¹⁴ or

106. Interference contestants may be two or more patent applicants, or one or more patent applicants and one or more patentees. *See* 35 U.S.C. § 135(a). Patentees are provided limited protection against being drawn into interference proceedings by 35 U.S.C. § 135(b), which specifies that a patent applicant may not include in his or her patent application a claim for the same or substantially the same subject matter as that defined by a claim in an issued patent, unless the applicant's claim was presented to the PTO more than one year before the patent issued. *See id.* § 135(b).

107. *See* ROBERT L. HARMON, PATENTS AND THE FEDERAL CIRCUIT § 15.2, at 574 (3d ed. 1994).

108. *See id.* § 15.2(d), at 585 (noting that exceptions exist for lack of diligence, abandonment, and suppression).

109. *See, e.g.,* Hybritech Inc. v. Monoclonal Antibodies, Inc., 802 F.2d 1367, 1376 (Fed. Cir. 1986).

110. *See* 35 U.S.C. § 102(g).

111. *See* Coleman v. Dines, 754 F.2d 353, 359 (Fed. Cir. 1985).

112. *Id.* (quoting Gunter v. Stream, 573 F.2d 77, 80 (C.C.P.A. 1978)).

113. “All that remains to be accomplished, in order to perfect the act or instrument, belongs to the department of construction, not invention.” Mergenthaler v. Scudder, 11 App. D.C. 264, 276 (1897).

While conception is theoretically complete as of the time of the formation of the idea of the invention in the inventor's mind, the law does not recognize that conception has occurred until the inventor verifiably discloses the invention. *See* Coleman, 754 F.2d at 359. This disclosure, or manifestation, can be made to another person, or via a written disclosure. Refer to notes 307-11 *infra* and accompanying text. Regardless of its form, however, the date of the disclosure, and its content, if made orally, must be verified, *i.e.*, corroborated. Refer to Part IV.B.1 *infra* and note 176 *infra* and accompanying text (giving instances in which the document “speaks for itself” and requires no corroboration).

114. *See, e.g.,* Hahn v. Wong, 892 F.2d 1028, 1032 (Fed. Cir. 1989) (explaining that reduction to practice of a chemical composition is established by showing “that the inventor actually prepared the composition and knew it would work” (quoting Mikus v. Wachtel, 542 F.2d 1157, 1159 (C.C.P.A. 1976))); Newkirk v. Lulejian, 825 F.2d 1581, 1583 (Fed. Cir. 1987) (“Proof of actual reduction to practice requires more than theoretical capability; it requires showing that the apparatus . . . actually existed and worked for its intended purpose.”).

filing a patent application that complies with the requirements of the patent statute, including the requirement for a complete, written description of the invention in a manner sufficient to explain how to make and use it.¹¹⁵ Constructing an invention and showing that it is operable for its intended purpose constitutes an “actual” reduction to practice.¹¹⁶ The filing of a patent

115. See generally *Bigham v. Godtfredsen*, 857 F.2d 1415, 1417 (Fed. Cir. 1988) (noting that an application relied on as a constructive reduction to practice must satisfy the written description, enablement, and best mode requirements of 35 U.S.C. § 112); see also Thomas L. Irving & Stacy D. Lewis, *Proving a Date of Invention and Infringement After GATT/TRIPS*, 22 AIPLA Q. J. 309, 326-27 (1994).

116. See *Schendel v. Curtis*, 83 F.3d 1399, 1402 (Fed. Cir. 1996) (“[E]very limitation of the interference count must exist in the embodiment and be shown to have performed as intended.” (alteration in original) (quoting *Newkirk*, 825 F.2d at 1582)); see also *Hahn*, 892 F.2d at 1032 (“To establish reduction to practice of a chemical composition, it is sufficient to prove ‘that the inventor actually prepared the composition and knew it would work.’” (quoting *Mikus*, 542 F.2d at 1159)).

Whether and to what extent an invention must be tested in order to establish a reduction to practice depends upon the character of the invention. For example, “[s]ome devices are so simple and their purpose and efficacy so obvious that their complete construction is sufficient to demonstrate workability.” *King Instrument Corp. v. Otari Corp.*, 767 F.2d 853, 861 (Fed. Cir. 1985) (alterations in original) (quoting *Eastern Rotorcraft Corp. v. United States*, 384 F.2d 429, 431 (Ct. Cl. 1967)); see also *Corona Cord Tire Co. v. Dovan Chem. Corp.*, 276 U.S. 358, 383 (1928) (citing three decisions of the U.S. Court of Appeals for the District of Columbia to support the proposition that testing is not required for simple inventions). At the other end of the spectrum, there are some complex inventions which require laboratory tests that “accurately duplicate actual working conditions in practical use.” See *Scott v. Finney*, 34 F.3d 1058, 1062 (Fed. Cir. 1994) (quoting *Elmore v. Schmitt*, 278 F.2d 510, 513 (C.C.P.A. 1960)). For example, the invention in *Elmore* was a binary counter for use in sophisticated radar and video equipment. See *Elmore*, 278 F.2d at 511. The court regarded the various tests performed as insufficient, because they did not account for “the resistance and character of load, nature of pulses, including voltage, duration and amplitude, and amount of capacitance used” nor did they “reproduce[] the conditions of temperature, vibration, or sustained operation which would usually be encountered in a specific use.” *Id.* at 512.

Between inventions that do not require testing and those that require testing under actual use conditions are “[l]ess complex inventions [that] do not demand such stringent testing.” *Scott*, 34 F.3d at 1062. The *Scott* court cited *Sellner v. Solloway*, 267 F.2d 321 (C.C.P.A. 1959), as an example of this type of invention. The invention in *Sellner* was an exercise chair that was demonstrated at a birthday party by “individuals without particular skills.” See *Scott*, 34 F.3d at 1062. The demonstration was held sufficient because “the device involved and the manner in which it is intended to operate are comparatively simple.” *Sellner*, 267 F.2d at 323.

The Federal Circuit recently reaffirmed the rule that a reduction to practice does not occur until the inventor knew the invention would work. See *Estee Lauder Inc. v. L’Oreal, S.A.*, 129 F.3d 588, 594-95 (Fed. Cir. 1997) (“[W]hen testing is necessary to establish utility, there must be recognition and appreciation that the tests were successful for reduction to practice to occur.”). The invention in *Estee Lauder* was a composition for increasing the Sun Protection Factor (“SPF”) in sunscreen. See *id.* at 590-91. Following some qualitative skin testing, the inventor and his colleagues prepared test samples of the composition and sent them to an independent laboratory for SPF testing. See *id.* When the results came back from the laboratory, the inventor “calculated the means of the . . . results, compared them,

application in compliance with statutory requirements is a "constructive" reduction to practice.¹¹⁷

In an interference, the party who conceives first and reduces to practice first is generally entitled to the patent.¹¹⁸ An exception to this general rule is made, however, for a party who conceives first and reduces to practice last if that party is diligent in reducing to practice from a time just prior to the other party's conception up to its own reduction to practice.¹¹⁹ As the Federal Circuit explained, priority of invention is awarded to "the first party to reduce an invention to practice unless the other party can show that it was the first to conceive the invention and that it exercised reasonable diligence in later reducing that invention to practice."¹²⁰ Thus, in an interference proceeding, diligence is only an issue when one of the parties can establish the earliest

and concluded that [the composition] was effective at boosting SPF." *Id.* at 591. Unfortunately for Estee Lauder, the date by which it had to establish a reduction to practice in order to prevail in the interference with L'Oreal fell within the five week period between the date Estee Lauder sent the samples to the testing laboratory and the date the results were reviewed and analyzed by the inventor. *See id.* at 590-92.

The district court's determination that the laboratory tests established a reduction to practice for Estee Lauder "even though neither inventor, nor any other Estee Lauder employee or agent, received and analyzed the . . . test results or concluded that the tests were successful until after the critical date" was reversed by the Federal Circuit. *Id.* at 592, 595. In so holding, the court made clear that there was no issue regarding the sufficiency of the testing. *See id.* at 594. Furthermore, the evidence that the tests had been run by the critical date was uncontroverted. *See id.* at 591-92. Estee Lauder's failing was its inability to establish that the results had been interpreted and appreciated before that date. *See id.* at 595.

The requirement that the inventor, or someone acting on his behalf, appreciate the success of an invention before a reduction to practice will be recognized is apparently based on the notion that without such appreciation, the inventor cannot have the "definite and permanent idea of the complete and operative invention required by the patent law for conception." *Knorr v. Pearson*, 671 F.2d 1368, 1375 (C.C.P.A. 1982). The continued vitality of the appreciation requirement has implications for the use of electronic record evidence to prove invention dates. Refer to Part V.B.2 *infra*.

117. *See, e.g., Hazeltine Corp. v. United States*, 820 F.2d 1190, 1196 (Fed. Cir. 1987).

118. *See, e.g., Mahurkar v. C.R. Bard, Inc.*, 79 F.3d 1572, 1577 (Fed. Cir. 1996) ("In the United States, the person who first reduces an invention to practice is 'prima facie the first and true inventor.'" (quoting *Christie v. Seybold*, 55 F. 69, 76 (6th Cir. 1893))), *cert. denied*, 119 S. Ct. 874 (1999).

119. *See, e.g., id.* at 1577 (explaining that "the person 'who first conceives, and, in a mental sense, first invents . . . may date his patentable invention back to the time of its conception, if he connects the conception with its reduction to practice by reasonable diligence on his part, so that they are substantially one continuous act'" (quoting *Christie*, 55 F. at 76)); *see also* 35 U.S.C. § 102(g) (1994). The consideration of first conception and diligence in determining priority balances the public's interest in encouraging early disclosure of the invention with the policy of encouraging invention. *See Griffith v. Kanamaru*, 816 F.2d 624, 626 (Fed. Cir. 1987).

120. *Price v. Symsek*, 988 F.2d 1187, 1190 (Fed. Cir. 1993).

conception but not the earliest reduction to practice.¹²¹ In such a case, only the diligence of the first to conceive and last to reduce to practice matters.¹²²

The U.S. patent system is founded, in part, on the national policy of encouraging early disclosure of inventions.¹²³ Yet awarding a patent for a particular invention to the party who was first to conceive but last to reduce to practice is not necessarily consistent with that policy. For example, our system sometimes denies a patent to the first party to file a patent application even when that party, by filing first, was the first to take an affirmative step toward bringing the invention to the public.¹²⁴ For this reason, proving priority based on first conception plus diligence is disfavored.¹²⁵ Consequently, the courts impose rigorous standards for demonstrating diligence, which, as a result, can be difficult to prove.¹²⁶ Even a short period

121. See Irving & Lewis, *supra* note 115, at 327.

122. See 35 U.S.C. § 102(g) ("In determining priority of invention there shall be considered not only the respective dates of conception and reduction to practice of the invention, but also the reasonable diligence of one who was first to conceive and last to reduce to practice, from a time prior to conception by the other.").

123. See, e.g., *W.L. Gore & Assocs. v. Garlock, Inc.* 721 F.2d 1540, 1550 (Fed. Cir. 1983) (noting that as between a prior inventor who suppresses or otherwise conceals an invention from the public and a subsequent inventor who promptly files a patent application from which the public will potentially have access to the invention, the law favors the latter); *Studiengesellschaft Kohle mbH v. Dart Indus.*, 549 F. Supp. 716, 743 (D. Del. 1982) (explaining that the patent law seeks to encourage prompt, early disclosure).

124. As previously discussed, between conflicting claimants, a patent is awarded to the party who can demonstrate that it was the first to invent, regardless of which filed first. Refer to notes 105-108 *supra* and accompanying text. However, the majority of patent interferences are won by the party who was first to file its application. See Macedo, *supra* note 104, at 568 (stating that 75% of senior parties (parties who file first) win interferences). As a result, it has been argued that the United States employs a "de facto first-to-file" system. See Vito J. DeBari, Note *International Harmonization of Patent Law: A Proposed Solution to the United States' First-To-File Debate*, 16 FORDHAM INT'L L.J. 687, 705-06 (1993) (attributing the large percentage of interferences won by senior parties to the heavy burden of proof born by a junior party who tries to pre-date a senior party's filing date).

Patent interferences are usually won by the first party to file, who is designated by the PTO as the "senior party", because the other party or parties (designated the "junior party" or "junior parties") bears the burden of proof on the issue of priority. See 37 C.F.R. § 1.601(m) (1998); *id.* § 1.657(a). When the interference involves two pending patent applications, or the junior party is a patentee, the junior party must prove priority by a preponderance of the evidence. See *id.* § 1.657(b); see also *Morgan v. Hirsch*, 728 F.2d 1449, 1451 (Fed. Cir. 1984) (two patent applications); *Thomson v. Armitage*, 665 F.2d 1032, 1035 (C.C.P.A. 1981) (junior party patentee). However, when the senior party is a patentee, the junior party must establish priority by clear and convincing evidence. See 37 C.F.R. § 1.657(c).

125. See Irving & Lewis, *supra* note 115, at 329-30 (stating that an inventor who seeks to rely on diligence faces a heavy burden).

126. See *id.* at 330 (stating that a party must show virtually daily activities

of inactivity, for which no valid excuse can be shown,¹²⁷ can destroy a party's ability to rely on its conception date.¹²⁸

Parties who seek to establish priority by proving either a first reduction to practice, or first conception plus diligence, must proffer evidence to demonstrate facts consistent with the legal definitions of conception, reduction to practice, and diligence as of particular dates or at least prior to particular dates.¹²⁹ The relevant activities may span a period of months or even years. Essential evidence may be found in documents, such as notes of laboratory experiments and field tests, and in the recollections of

towards reduction to practice); *see also* *Moller v. Harding*, 214 U.S.P.Q. (BNA) 724, 729 (Bd. Pat. Int. 1982) (denying a bid to establish priority on the ground that a one and one-half month period was unaccounted for).

127. For example, delay attributable to efforts to attract commercial interest or to "refine an invention to the most marketable and profitable form have not been accepted as sufficient excuses for inactivity." *Griffith v. Kanamaru*, 816 F.2d 624, 626-27 (Fed. Cir. 1987). However, an attorney's work on other, closely-related patent applications at the same time has been held sufficient to justify delay in filing a patent application under the theory that the work on the related cases contributed substantially to the preparation of the application at issue. *See Bey v. Kollonitsch*, 806 F.2d 1024, 1028-29 (Fed. Cir. 1986) (stating that to hold otherwise would penalize a process that actually expedites the filing of applications). The court in *Griffith* provided other examples of excusable delay, including a reasonable vacation period, time required for testing the invention, necessity of earning a livelihood, and poor health. *See Griffith*, 816 F.2d at 626-27.

128. *See Gould v. Schawlow*, 363 F.2d 908, 918 (C.C.P.A. 1966) (declaring that general statements that the party was diligent or that during no period was the party not diligent are insufficient to establish diligence).

129. United States patent applicants whose inventive activities were carried out in foreign countries have, until recently, been precluded from establishing a date of invention based on those activities. Refer to note 133 *infra*. As a result, an applicant in this position was left to rely on its application filing date in an interference. *See, e.g., Lacotte v. Thomas*, 758 F.2d 611, 612 (Fed. Cir. 1985) (noting that Lacotte relied on its French application filing date). In other cases, a party relies on its filing date when it lacks other evidence of invention or perhaps is confident that the other party cannot prove an earlier invention date. In such cases, the other party is aware of the date it has to "beat." When, however, each party is trying to establish invention dates based on its own inventive activity, each is focused on trying to prove the earliest possible date. *See, e.g., Kridl v. McCormick*, 105 F.3d 1446, 1448 (Fed. Cir. 1997) (noting that both parties submitted evidence of invention).

The official parties to a patent interference instituted by the PTO are the applicants or the applicants and patentees of the applications or patents involved. *See* 37 C.F.R. § 1.601(l) (1998). Because patent applications must be filed in the names of the individual inventor(s) of the subject matter claimed, and patents are issued in the names of individual inventors, interferences are conducted in the names of individual inventors. However, it is the long-standing practice of the PTO to consider joint inventors as a single party in an interference. *See Davis v. Loesch*, 998 F.2d 963, 966 (Fed. Cir. 1993). In addition, when the applications have been assigned, for example, to the individual inventors' employers, the real parties in interest are the assignees. *See, e.g., Fujikawa v. Wattanasin*, 93 F.3d 1559, 1561 (Fed. Cir. 1996). For these reasons, interference parties are generally referred to herein in the third person neuter.

co-workers, supervisors, suppliers, and customers.¹³⁰ Consequently, it may be difficult for a party to identify, locate, and organize the evidence needed to prove prior invention.¹³¹ However, as arduous as this task may be in itself, the PTO and the courts have developed a unique evidentiary requirement for interference proceedings that makes proving priority of invention even more difficult. This requirement—corroboration—is discussed below.

B. *The Requirement for Corroboration in Interference Proceedings*

1. *Independent Evidence of Invention is Required.* The challenge of proving prior invention is made significantly more difficult by the requirement that the inventor's proof regarding dates of invention be corroborated by evidence originating with someone or something independent of the inventor that substantiates the inventor's account. The Board and the courts have traditionally required oral or written corroboration of the inventor's disclosure of the conception to others,¹³² of the work relied upon as proof of an actual reduction to practice,¹³³ and of the activity asserted to constitute diligence.¹³⁴

130. See generally Irving & Lewis, *supra* note 115, at 333-49 (explaining the process of record keeping and the development of testimonial evidence in order to prove the date of an invention).

131. See Peter A. Jackman, *Adoption of a First-To-File Patent System: A Proposal*, 26 U. BALT. L. REV. 67, 83 (1997) (describing the burdens of gathering evidence of invention).

132. See, e.g., *Radio Corp. of Am. v. Philco Corp.*, 201 F. Supp. 135, 150 (E.D. Pa. 1961), *aff'd*, 309 F.2d 397 (3d Cir. 1962).

133. See *Reese v. Hurst*, 661 F.2d 1222, 1225 (C.C.P.A. 1981); *Hasselstrom v. McKusick*, 324 F.2d 1013, 1018 (C.C.P.A. 1963) (holding that the testimony of three witnesses, taken together, corroborated the inventors' reduction to practice of every element of the interference count). Because the PTO can verify the date a patent application was filed, and because the content of the application speaks for itself as to its compliance with the statute's disclosure requirements, there is no requirement for corroboration of a constructive reduction to practice. See Irving & Lewis, *supra* note 115, at 331 (noting that corroboration is only required when the party attempts to prove conception and actual reduction to practice).

The same is true when an inventor relies on the filing date of his or her foreign patent application for the date of invention. See *id.* Pursuant to 35 U.S.C. § 119, a U.S. patent application filed by an inventor who has previously filed a patent application for the same invention in a foreign country that extends reciprocal rights to inventors who file first in the United States "shall have the same effect as the same application would have if filed in this country" on the date on which the foreign application was filed, if the U.S. application is filed within 12 months of the foreign application filing and certain other conditions are met. See 35 U.S.C. § 119(a) (1994). Thus, an applicant for a U.S. patent may claim the benefit of an earlier foreign-filed application for the same invention. See *id.* § 119(b). If the U.S. application (or a patent issued on such an application) becomes involved in an interference, or the

The requirement for corroboration can be traced to the 1869 decision of the Commissioner of Patents in *Doughty v. Clark*.¹³⁵ In *Doughty*, the Commissioner awarded priority to the party whose testimony on the issue of date of invention was supported by the testimony of noninventor assistants over the party whose testimony was unsupported.¹³⁶ The need for corroboration, specifically, for an inventor's proof of conception, was explained a century ago by the court in *Mergenthaler v. Scudder*.¹³⁷

The fact of conception by an inventor, for the purpose of establishing priority, can not be proved by his mere allegation, nor by his unsupported testimony, where

applicant's date of invention otherwise becomes an issue, the foreign application may serve as a constructive reduction to practice if the foreign application complies with the legal requirements governing the sufficiency of a patent application. *See In re Ziegler*, 992 F.2d 1197, 1199 (Fed. Cir. 1993) (maintaining that a German application did not meet the sufficiency requirements and, therefore, the applicant could not claim the benefit of its filing date).

Prior to the enactment of the North American Free Trade Agreement ("NAFTA") and the Uruguay Round Agreements Act ("URAA"), U.S. patent applicants (other than those working for the government) were permitted to establish a date of invention only by proving inventive acts (including the filing of a patent application) that occurred in the United States or by relying on a foreign priority application. *See* John F. Carroll, IV, Note, *Priority of Invention in United States Patents: From the Paris Convention to GATT*, 1 RICH. J.L. & TECH. 3, 22-24 (Apr. 10, 1995) <<http://www.urich.edu/~jolt/v1i1/carroll.html>>. The patent statute precluded reliance on proof of any other foreign inventive activity:

In proceedings in the Patent and Trademark Office and in the courts, an applicant for a patent, or a patentee, may not establish a date of invention by reference to knowledge or use thereof, or other activity with respect thereto, in a foreign country, except as provided in sections 119 and 365 of this title.

35 U.S.C. § 104 (1988) (amended 1993); *see also* *Kawai v. Metlesics*, 480 F.2d 880, 885-86 (C.C.P.A. 1973) (explaining the limiting effect of prior § 104). Section 104 has now been amended to remove work done in NAFTA and World Trade Organization countries from the prohibition against reliance on evidence of foreign inventive activity:

In proceedings in the Patent and Trademark Office, in the courts, and before any other competent authority, an applicant for a patent, or a patentee, may not establish a date of invention by reference to knowledge or use thereof, or other activity with respect thereto, in a foreign country other than a NAFTA country or a WTO member country, except as provided in sections 119 and 365 of this title.

35 U.S.C. § 104 (Supp. II 1996). As a result of this amendment, evidentiary requirements governing proof of a date of invention, including the requirement for corroboration, now apply to those engaged in foreign inventive activities upon which U.S. patent applications are based. *See* Irving & Lewis, *supra* note 115, at 312-13.

134. *See* *Price v. Symsek*, 988 F.2d 1187, 1196 (Fed. Cir. 1993) (requiring corroboration to support testimony regarding reasonable diligence); *Loral Fairchild Corp. v. Victor Co. of Japan, Ltd.*, 931 F. Supp. 1014, 1030 (E.D.N.Y. 1996) (same).

135. 1869 Dec. Comm'r Pat. 14.

136. *See id.*

137. 11 App. D.C. 264 (1897).

there has been no disclosure to others or embodiment of the invention in some clearly perceptible form, such as drawings or model, with sufficient proof of identity in point of time. For otherwise such facile means of establishing priority of invention would, in many cases, offer great temptation to perjury, and would have the effect of virtually precluding the adverse party from the possibility of rebutting such evidence. Hence it has been ruled in many cases that the mere unsupported evidence of the alleged inventor, on an issue of priority, as to the fact of conception and the time thereof, can not be received as sufficient proof of the fact of prior conception.¹³⁸

Five years after *Mergenthaler*, in *Petrie v. De Schweinitz*,¹³⁹ the District of Columbia Court of Appeals explained that corroboration is similarly required for proof of a reduction to practice.¹⁴⁰ James Petrie testified to carrying out an actual reduction to practice of the invention at issue, a process for improving "tobacco of inferior quality."¹⁴¹ While others had testified that Mr. Petrie told them "what he had done or was doing in the way of practicing and perfecting his process for improving tobacco,"¹⁴² all of Mr. Petrie's actual experimentation was done in secret.¹⁴³ In view of this evidence, the court affirmed the determination of the Commissioner of Patents that the evidence was insufficient to establish reduction to practice.¹⁴⁴ According to the Commissioner:

The testimony of the witness as to what Petrie told them he was doing or intended to do may be taken as showing that he had a conception of the invention at that time, but it cannot be accepted as showing a reduction to practice. Petrie himself is the only one who testifies to an actual performance of the process of the issue. None of the others saw it, and all that they know of it was derived from Petrie's statements. The testimony of these witnesses does not corroborate Petrie's present statement that he successfully performed the process, and his unsupported statement to that effect is insufficient to establish the fact. From the nature of the invention, the result of his experiments performed in

138. *Id.* at 278.

139. 19 App. D.C. 386 (1902).

140. *See id.* at 389.

141. *See id.* at 387-88.

142. *Id.* at 388.

143. *See id.*

144. *See id.* at 389-90.

secret could not be preserved to show what was done and whether or not it amounted to a reduction to practice of the invention, and his present statement of his conclusion that his experiments were successful and constituted a reduction to practice of the invention is not capable of being rebutted any more than would be the statement of an inventor as to his conception. Considering the natural bias of a party and the incentive to color the testimony in his own interest, it has been repeatedly held that the unsupported testimony of the inventor is insufficient to establish facts of this kind.¹⁴⁵

The courts and the Board have continued to reiterate this policy¹⁴⁶ as they apply the rule that, as a matter of law, an inventor's uncorroborated proof of invention, whether on the issue of conception,¹⁴⁷ reduction to practice,¹⁴⁸ or reasonable diligence,¹⁴⁹ cannot be held to establish these events. Thus, what began as an apparent *preference* for corroborated testimony in *Doughty*¹⁵⁰ has evolved into a legal *requirement* that evidence emanating from an inventor be corroborated by independent evidence.¹⁵¹

145. *Id.* at 388-89.

146. *See generally* Mahurkar v. C.R. Bard, Inc., 79 F.3d 1572, 1577 (Fed. Cir. 1996) ("This requirement arose out of a concern that inventors testifying in patent infringement cases would be tempted to remember facts favorable to their case by the lure of protecting their patent or defeating another's patent."); Hahn v. Wong, 892 F.2d 1028, 1033 (Fed. Cir. 1989) ("The purpose of the rule requiring corroboration is to prevent fraud." (quoting Berry v. Webb, 412 F.2d 261, 267 (C.C.P.A. 1969))); Allen v. Blaisdell, 196 F.2d 527, 529 (C.C.P.A. 1952) ("However harsh the rule may seem at times, the absolute necessity for it becomes apparent upon reflection. Without it the patent system might be virtually destroyed by fraud and perjury."); Horton v. Stevens, 7 U.S.P.Q.2d (BNA) 1245, 1247-48 (Bd. Pat. App. & Int. 1988) ("The purpose of the rule . . . is . . . to establish, by proof that is unlikely to have been fabricated or falsified, that the inventor successfully reduced his invention to practice.").

147. *See, e.g.,* Price v. Symsek, 988 F.2d 1187, 1194 (Fed. Cir. 1993) ("[T]he case law is unequivocal that an inventor's testimony respecting the facts surrounding a claim of derivation or priority of invention cannot, standing alone, rise to the level of clear and convincing proof.").

148. *See, e.g.,* Lacotte v. Thomas, 758 F.2d 611, 613 (Fed. Cir. 1985) ("[A]ctual reduction to practice cannot be established by the uncorroborated testimony of the inventor alone . . .").

149. *See, e.g.,* Loral Fairchild Corp. v. Victor Co. of Japan, Ltd., 931 F. Supp. 1014, 1030 (E.D.N.Y. 1966) ("[T]he inventor must corroborate evidence of reasonable diligence."); *see also* Price, 988 F.2d at 1196 (requiring corroboration to support the inventor's testimony regarding reasonable diligence).

150. Refer to notes 135-36 *supra* and accompanying text (describing the *Doughty* decision in which the Commissioner awarded priority to the party with corroborating evidence).

151. *See, e.g.,* Reese v. Hurst, 661 F.2d 1222, 1225 (C.C.P.A. 1981) ("[E]vidence of corroboration must not depend solely on the inventor himself."); Horton, 7 U.S.P.Q.2d (BNA) at 1248 ("[C]orroborative evidence . . . must be independent of

For example, a letter written by an inventor describing experimental work alleged to constitute an actual reduction to practice cannot provide corroboration, even when the letter was authenticated as received by a noninventor as of the date alleged by the inventor, because the recipient had no independent knowledge of the work described.¹⁵² Similarly, test results provided by an independent, third-party analytical laboratory establishing the uranium content of samples alleged to have been produced by the process invention at issue do not corroborate an actual reduction to practice of the process, because the samples submitted to the laboratory could have been produced by another process.¹⁵³

2. *Corroboration vs. Admissibility.* The Board and the courts have not always recognized the distinction between the requirements of admissibility and corroboration. The confusion seems to have originated with the opinion of the Court of Customs and Patent Appeals (“C.C.P.A”)—predecessor to the Federal Circuit—in *Alpert v. Slatin*.¹⁵⁴ The court in *Alpert* was asked to regard progress reports of research results, apparently prepared in the ordinary course of business, as evidence of the experimental results reported therein.¹⁵⁵ *Alpert*, the proponent of the reports, relied on the federal shop book rule,¹⁵⁶ the predecessor of the business record exception codified in Federal Rule of Evidence 803(6).¹⁵⁷ The court responded:

We take this contention to mean that these reports must be accepted as proving all statements made therein.

We do not agree with that contention. The federal shop book rule of 28 U.S.C. § 1732 applies to admissibility of routine documents and records which experience has shown to be trustworthy but such records must be weighed against all other circumstances. *Alpert* has cited no authority to show that the rule is properly applicable to reports of scientific research and tests. We know of no authority for such a position and think such application of the rule would be both improper and unrealistic. Such reports, in our opinion, are no more than the usual

information received from the inventor.”).

152. See *Reese*, 661 F.2d at 1231.

153. See *id.*

154. 305 F.2d 891 (C.C.P.A. 1962).

155. See *id.* at 895 (offering the testimony of seven co-inventors and numerous documentary exhibits to demonstrate the trustworthiness of the records).

156. 28 U.S.C. § 1732 (1994).

157. See *Alpert*, 305 F.2d at 895.

inventor's work or progress reports which the decisions of this court have held cannot be relied on to establish reduction to practice since they are not an independent corroboration of an inventor's testimony.¹⁵⁸

Citing *Alpert*, the C.C.P.A. and the Board, in a series of cases, concluded that the shop book rule did not apply to records of inventors' work.¹⁵⁹ Yet, in other cases the Board and courts clearly contemplated the admission of, or outright admitted, documentary proof of invention into evidence.¹⁶⁰ In fact, documentary evidence of invention, including inventors' notebooks and reports, is routinely considered in interferences today.¹⁶¹

A close reading of the cases reveals that the "*Alpert* rule" relates to corroboration, not admissibility—despite the confusing language of *Alpert* and its progeny. It is well settled

158. *Id.* at 895-96 (citations omitted).

159. *See, e.g., Elliott v. Barker*, 481 F.2d 1337, 1340 (C.C.P.A. 1973) (admitting into evidence a sketch because "[i]t is not a report of scientific research or tests as found inadmissible in *Alpert v. Slatin*"); *Wolter v. Belicka*, 409 F.2d 255, 258 (C.C.P.A. 1969) (holding that the shop-book rule was not intended to apply to laboratory test notes); *Horton v. Stevens*, 7 U.S.P.Q.2d (BNA) 1245, 1249 (Bd. Pat. App. & Int. 1988) ("The so-called Shop-Book rule . . . does not apply to reports of scientific work in an interference proceeding."); *Larkin v. Kauder*, 202 U.S.P.Q. (BNA) 193, 199 (Bd. Pat. Int. 1978) ("To the extent that Kauder may be relying upon the 'shop-book rule,' the 'rule' does not apply to the usual inventor's work in interference proceedings."); *Flynn v. Arkley*, 187 U.S.P.Q. (BNA) 513, 520 (Bd. Pat. Int. 1975) (stating that "[t]he CCPA and this Board . . . have held that the Federal Shopbook Rule does not apply in interference proceedings before the Patent Office," but holding that a page of a laboratory notebook should be admitted into evidence in the interests of justice); *Rochling v. Burton*, 178 U.S.P.Q. (BNA) 300, 303 (Pat. Off. Bd. Pat. Int. 1971) (refusing to accept inventors' reports as establishing the identity of the compounds in question on the basis of the federal shop-book rule).

160. *See, e.g., Anderson v. Pieper*, 442 F.2d 982, 983-84 (C.C.P.A. 1971) (recounting the Board's admission of the inventor's notebook entries regarding experimental runs of the method of the invention); *Glaser v. Strickland*, 220 U.S.P.Q. (BNA) 446, 452 (Bd. Pat. Int. 1983) (refusing to admit graphs of experimental data under Rule 803(6), but only because the proponent failed to lay the proper foundation).

161. *See Smollar v. Cawley*, 31 U.S.P.Q.2d (BNA) 1506, 1512 (Bd. Pat. App. & Int. 1993) (denying a motion to suppress exhibits and noting that the "arguments presented relate to the weight to be given the exhibits rather than to the admissibility thereof"); *see also Lawson v. Enloe*, 26 U.S.P.Q.2d (BNA) 1594, 1598-99 (Bd. Pat. App. & Int. 1992) (considering the evidentiary sufficiency of notebook pages in an interference proceeding); *Schrag v. Strosser*, 21 U.S.P.Q.2d (BNA) 1025, 1027-28 (Bd. Pat. App. & Int. 1991) (finding that a Field Test Report, Monthly Summary Report, Interoffice Memo, and a photograph were sufficient to establish a prima facie public use of the subject matter prior to the critical date); *Colbert v. Lofdahl*, 21 U.S.P.Q.2d (BNA) 1068, 1069 (Bd. Pat. App. & Int. 1991) (considering whether an initial draft of a letter constituted a conception of an invention); *Suh v. Hoefle*, 23 U.S.P.Q.2d (BNA) 1321, 1329 (Bd. Pat. App. & Int. 1991) (holding laboratory notebook pages admissible as a record of conception).

that evidence of invention, whether testimonial or documentary, which emanates solely from an inventor, cannot establish a date of invention.¹⁶² In *Anderson v. Pieper*,¹⁶³ for example, Anderson sought to prove a date of invention prior to the filing date of Pieper's patent application.¹⁶⁴ The evidence included the testimony of Anderson's co-inventor, William Truett, that he carried out the method of the invention in his employer's laboratories.¹⁶⁵ Anderson submitted the notebook entries of Mr. Truett and his co-workers regarding the claimed process, and the Board found, based on the testimony and notebook entries, that the process was practiced on the dates asserted.¹⁶⁶ The Board's apparent acceptance of the testimony and notebook entries of the noninventor co-workers as corroboration for Mr. Truett's evidence on the issue of whether and when the process was practiced is consistent with the law of corroboration.¹⁶⁷

To prevail in the interference, however, Anderson was also required to establish that it had confirmed the identity of the product of the process by the critical date.¹⁶⁸ On this point, the only evidence offered to corroborate the inventors' testimony and notebook entries was a group of notebook entries by one Dr. Merckling, who was deceased at the time of the interference.¹⁶⁹ According to the court, Dr. Merckling's notebook entries purporting to describe his testing of the product "were received in evidence without objection, a thorough foundation of authenticity and admissibility having been laid through witnesses familiar with his handwriting and with practices at the laboratory relative to notebook entries."¹⁷⁰ However, the Board refused to accept the notebook entries as corroboration for the inventors' evidence:

[S]ince Merckling did not testify, these exhibits amount to no more than hearsay. Notebook records or reports of persons not testifying can not be regarded as proof of the experimental work recorded therein. . . [T]here is no evidence (other than the inventors' testimony and notes) that a useful *solid* polyethylene was produced in the

162. Refer to Part IV.B.1 *supra*.

163. 442 F.2d 982 (C.C.P.A. 1971).

164. *See id.* at 983.

165. *See id.*

166. *See id.* at 983-84.

167. Refer to Part IV.B.1 *supra* (explaining the law of corroboration).

168. *See Anderson*, 422 F.2d at 984.

169. *See id.* at 983-984.

170. *Id.*

experiments in question. Even though Exhibits 6 to 9 were introduced without objection it is not necessary that they be held valid corroboration of the alleged reduction to practice as these exhibits cannot be accorded any greater probative value than is proper under the circumstances.¹⁷¹

The court noted that the Board apparently regarded Dr. Merckling's notebook entries as admissible, "*which they clearly were, but as lacking sufficient weight to constitute corroboration.*"¹⁷²

According to the court, the Board relied on cases supporting the notion that "notebook entries cannot possibly establish corroboration unless the entrant testifies[,] and disregarded Dr. Merckling's notebook entries because he was unavailable to testify."¹⁷³ The court reversed the Board on this point, citing Dr. Merckling's unavailability as one reason to credit his notebook entries.¹⁷⁴ Thus, the *Anderson* court tacitly approved the rule that the fact finder may refuse to accord corroborative weight to documentary evidence of invention when the author is available to testify, but does not.¹⁷⁵

This rule—that documents regarding inventive activity "do not ordinarily speak for themselves"¹⁷⁶—has now been codified in

171. *Id.* at 984 (quoting from the decision of the Board).

172. *Id.* (emphasis added).

173. *Id.*

174. *See id.* at 984-85 (noting that Dr. Merckling was "as unavailable to testify as one could ever be").

175. Such was the case in *Teter v. Kearby*, 169 F.2d 808, 816 (C.C.P.A. 1948), a case relied upon by the court in *Alpert*, although not the case in *Alpert* itself. *See Alpert v. Slatins*, 305 F.2d 891, 893, 895 (C.C.P.A. 1962).

176. *Hahn v. Wong*, 13 U.S.P.Q.2d (BNA) 1211, 1214 (Bd. Pat. App. & Int.), *aff'd*, 892 F.2d 1028 (Fed. Cir. 1989). It should also be noted that in at least two situations, documentary evidence of invention has been held, in fact, to "speak for itself." The first is when the evidence is "virtually impossible" to fabricate. *See Berges v. Gottstein*, 618 F.2d 771, 775 (C.C.P.A. 1980) (holding that nuclear magnetic resonance and infrared spectra of the compound of the invention corroborated the inventor's testimony, and therefore, the proponent "did not have to submit an affidavit which specifically interpreted the results"). Similarly, the Federal Circuit has confirmed that documentary evidence of conception, properly authenticated, requires no corroboration. *See Kridl v. McCormick*, 105 F.3d 1446, 1451 (Fed. Cir. 1997) (stating that, as to conception, antisense constructs described in a notebook "speak for themselves"); *Mahurkar v. C.R. Bard, Inc.*, 79 F.3d 1572, 1577-78 (Fed. Cir. 1996) ("This court does not require corroboration where a party seeks to prove conception through the use of physical exhibits. The trier of fact can conclude for itself what documents show, aided by testimony as to what the exhibit would mean to one skilled in the art." (quoting *Price v. Symsek*, 988 F.2d 1187, 1195 (Fed. Cir. 1993), a case in which the Federal Circuit held that a drawing shown to have existed as of a certain date "is before the board for the board to make its own determinations as to what this piece of evidence discloses").

PTO interference rule 671(f):¹⁷⁷ “The significance of documentary and other exhibits identified by a witness in an affidavit or during oral deposition shall be discussed with particularity by a witness.”¹⁷⁸ Given the clarification provided by *Anderson*,¹⁷⁹ the routine consideration of documentary evidence of invention,¹⁸⁰ and the fact that the requirements of Rule 671(f) are not made a condition of admissibility,¹⁸¹ it appears clear that the *Alpert* court’s statement regarding the inapplicability of the shop book rule to documentary evidence of invention was erroneous. As the Board has subsequently stated, “the issue of corroboration is an issue distinct and separate from that of admissibility and we will not exclude evidence merely because it is said to be uncorroborated and therefore incompetent.”¹⁸²

3. *The Rule of Reason.* Over three decades ago, the C.C.P.A.¹⁸³ adopted a “rule of reason” for evaluating the sufficiency of corroborating evidence.¹⁸⁴ Under the rule of reason, “there is no final single formula that must be followed in proving corroboration”;¹⁸⁵ rather, *all* relevant evidence is to be evaluated “so that a sound determination of the credibility of the inventor’s story may be reached.”¹⁸⁶ The evidence “as a whole” must be considered.¹⁸⁷ Thus, it is not necessary, for example, that a party support its evidence of reduction to practice with the testimony of

177. 37 C.F.R. § 1.671(f) (1998).

178. *Id.* See generally *Chandler v. Mock*, 150 F.2d 563, 567 (C.C.P.A. 1945) (holding records standing alone to be meaningless); *Smith v. Bousquet*, 111 F.2d 157, 161 (C.C.P.A. 1940) (holding that unexplained tests in stipulated testimony are entitled to little weight); *Popoff v. Orchin*, 144 U.S.P.Q. (BNA) 762, 763 (Pat. Off. Bd. Pat. Int. 1963) (noting that unexplained experimental data should not be considered).

179. Refer to notes 163-75 *supra* and accompanying text.

180. Refer to notes 160-61 *supra*.

181. See 37 C.F.R. § 1.671(f).

182. *Halbert v. Schuurs*, 220 U.S.P.Q. (BNA) 558, 561 (Bd. Pat. Int. 1983).

183. At the time of the emergence of the “rule of reason,” appellate review of Board interference decisions was conducted by the Court of Customs and Patent Appeals, which was merged, under the authority of the Federal Courts Improvement Act of 1982, with the Court of Claims to form the U.S. Court of Appeals for the Federal Circuit. See Federal Courts Improvement Act of 1982, Pub. L. No. 97-164, § 120, 1982 U.S.C.C.A.N. (96 Stat) 25, 33.

184. See Warren M. Haines II, *Recent Decisions*, *Price v. Symsek*, 32 DUQ. L. REV. 149, 160 (1993) (noting that the Court of Appeals for the Federal Circuit and the Court of Customs and Patent Appeals have employed a “rule of reason” to ease the requirement of corroborative evidence).

185. *Berry v. Webb*, 412 F.2d 261, 266 (C.C.P.A. 1969).

186. *Price v. Symsek*, 988 F.2d 1187, 1195 (Fed. Cir. 1993).

187. See *Berges v. Gottstein*, 618 F.2d 771, 776 (C.C.P.A. 1980) (noting that each corroboration case must be decided on its own facts with a view to deciding whether all the evidence taken together is persuasive).

one who actually witnessed the testing relied upon.¹⁸⁸ While testimony regarding such “over-the-shoulder” observation is clearly admissible and is regarded by the courts as “strong evidence,”¹⁸⁹ its absence does not preclude establishing a date of invention.¹⁹⁰ Circumstantial evidence independent of the inventor can also provide the required corroboration.¹⁹¹ Such circumstantial evidence may include documentary evidence and the activities of others.¹⁹²

The rule of reason is based on a “recognition of the realities of technical operations in modern day laboratories.”¹⁹³ According to the C.C.P.A., a corroboration rule that would require the testimony of a first-hand witness to inventive activity “plainly does not comport with the reality of technical operations involving numerous people necessarily separated from each other in time and distance and each involved in their own highly specialized part of a large operation.”¹⁹⁴ The courts refer to such technical operations as “organized research endeavor[s]”¹⁹⁵ or “organized research program[s].”¹⁹⁶ The routine practice of procedures such as sample handling and documentation and reporting of the results of research efforts in such research programs is considered to provide sufficient assurances of credibility.¹⁹⁷

For example, in *Lacotte v. Thomas*,¹⁹⁸ the Federal Circuit applied the rule of reason to sustain a determination of priority based on proof of an actual reduction to practice despite an absence

188. See *id.* at 776 (“Appellee likewise errs in asserting that corroboration is not ‘independent’ when based on acts not personally observed. Certainly the analyses and tests performed by other SK&F personnel do not diminish in evidentiary value solely due to a lack of any actual witnesses of the synthesis of T-ceph-A.”).

189. See *Mikus v. Wachtel*, 542 F.2d 1157, 1159 (C.C.P.A. 1976) (noting that the testimony of one who witnesses and understands the actual reduction to practice is strong evidence).

190. See *id.* at 1159; see also *Nashef v. Pollock*, 4 U.S.P.Q.2d (BNA) 1631, 1636 (Bd. Pat. App. & Int. 1987) (“Over-the-shoulder observation of every step is not necessary to satisfy the corroboration rule where there is independent circumstantial evidence of a reduction to practice.”).

191. See *Berges*, 618 F.2d at 776. The rule of reason applies to determinations of the sufficiency of corroboration for evidence of conception, reduction to practice, and reasonable diligence. See *Price*, 988 F.2d at 1195.

192. See *Mikus*, 542 F.2d at 1159.

193. *Berry v. Webb*, 412 F.2d 261, 266 (C.C.P.A. 1969).

194. *Hurwitz v. Shiu Yim Poon*, 364 F.2d 878, 887 (C.C.P.A. 1966).

195. See *Berry*, 412 F.2d at 267.

196. See *Lacotte v. Thomas*, 758 F.2d 611, 613 (Fed. Cir. 1985).

197. See, e.g., *Berges v. Gottstein*, 618 F.2d 771, 775 (C.C.P.A. 1980) (“Equally relevant to the issue of corroboration of an actual reduction to practice are the routine pathways by which knowledge of ongoing research was disseminated throughout the cephalosporin research team.”).

198. 758 F.2d 611 (Fed. Cir. 1985).

of first-hand witness testimony.¹⁹⁹ The invention at issue was a process for making copies of video discs.²⁰⁰ The junior party, Thomas, sought to establish priority by showing an actual reduction to practice—that the process had been successfully carried out prior to the invention date of Lacotte.²⁰¹ As evidence, the party Thomas submitted Mr. Thomas's testimony (by way of affidavit²⁰²) and entries from his research notebook.²⁰³ In addition to this evidence, which depended solely on Mr. Thomas, the testimony of two witnesses and additional documentary evidence was submitted.²⁰⁴

Specifically, Thomas submitted the testimony of Mr. Thomas's research associate, who testified that he had supplied materials necessary to practice the process in question to Mr. Thomas prior to the date Mr. Thomas claimed to have reduced the invention to practice.²⁰⁵ Thomas also submitted copies of requisition forms Mr. Thomas had used to obtain the materials he needed to practice the invention.²⁰⁶ The requisition forms bore dates prior to his alleged reduction to practice.²⁰⁷ Another of Mr. Thomas's research associates testified that he had examined replicate media produced by the process in question prior to Lacotte's invention date.²⁰⁸

The Federal Circuit upheld the Board's determination that Thomas had established a reduction to practice of the invention at issue prior to Lacotte's date of invention,²⁰⁹ and explained its decision as follows:

Although actual reduction to practice cannot be established by the uncorroborated testimony of the

199. *See id.* at 613 (relying on corroboration testimony and independent circumstantial evidence within an organized research program).

200. *See id.* at 612.

201. *See id.* (noting that Lacotte relied on its French filing date of May 7, 1975 as its invention date). Refer to notes 129, 133 *supra* (discussing the ability of an inventor to rely on activities conducted outside the United States to establish a date of invention).

202. *See Lacotte*, 758 F.2d at 612. The evidence in an interference proceeding may include testimony and referenced exhibits, discovery responses, official records and publications, deposition testimony, and the specification (including the claims and drawings) of any U.S. patent or patent application or foreign priority application. *See* 37 C.F.R. § 1.671(a) (1998). A party's case-in-chief in an interference before the Board is presented by way of affidavit and accompanying exhibits, with any cross-examination, redirect, or recross occurring via oral deposition. *See id.* §§ 1.672(a)-(b), (d).

203. *See Lacotte*, 758 F.2d at 612.

204. *See id.*

205. *See id.*

206. *See id.*

207. *See id.*

208. *See id.*

209. *See id.* at 613.

inventor alone, the facts set forth in the affidavits and exhibits here reveal an *organized research program routinely practiced* within the Eastman Kodak Company, designed to create a record sufficient to corroborate the testimony of the inventor. The testimony of Thomas, the inventor, and the written evidence of his reduction to practice in his notebook, *are corroborated by independent circumstantial evidence of his withdrawal of supplies to practice the invention, as well as independent corroborating testimony of his associate . . .* The combination of such corroborating testimony and independent circumstantial evidence within an organized research program was more than adequate for the board to have concluded that Thomas had proved facts establishing an actual reduction to practice by a preponderance of the evidence.²¹⁰

Thus, the court found assurances of credibility in the regularly conducted, routine business practices of Mr. Thomas's employer.²¹¹

Perhaps the best example of corroboration via an "organized research program" in the reported cases is provided by *Berges v. Gottstein*.²¹² Berges, the junior party, succeeded in establishing an actual reduction to practice of the invention in question—a cephalosporin compound useful in treating bacterial infections²¹³—prior to the invention date²¹⁴ of

210. *Id.* (emphasis added); see also *Nashef v. Pollock*, 4 U.S.P.Q.2d (BNA) 1631, 1636 (Bd. Pat. App. & Int. 1987) (holding evidence of testing of samples by co-workers corroborative).

One co-inventor cannot corroborate the evidence of another co-inventor. See, e.g., *Larson v. Johanning*, 17 U.S.P.Q.2d (BNA) 1610, 1613 (Bd. Pat. App. & Int. 1990). The corroborating evidence in *Lacotte* and *Nashef* exemplifies the value of the testimony of noninventors who have first-hand knowledge of circumstances and events pertinent to inventive activity. Other examples of such noninventor witnesses include:

- a) A chemist who mixes the ingredients to make the formulation of the invention but played no part in deciding on the ingredients to be used;
- b) A chemical analyst who determines the composition of the formulation using standard chemical analytical techniques and had no involvement in conceiving the composition or how it could be made or used; and
- c) An individual who tests the formulation to determine whether it will work in its intended utility but was not the person who conceived that utility.

Irving & Lewis, *supra* note 115, at 337.

211. The same rationale underlies the business records exception to the hearsay rule. Refer to note 66 *supra*.

212. 618 F.2d 771 (C.C.P.A. 1980).

213. See *id.* at 772. To establish an actual reduction to practice of a chemical compound, the proponent must show that the inventor actually prepared the compound and demonstrated it to be useful for its intended purpose. See, e.g., *Hahn*

Gottstein.²¹⁵ The circumstantial evidence relied upon for corroboration included: (1) testimony of an Smith, Kline and French (“SK&F”)²¹⁶ analytical chemist regarding her supervision of two elemental analyses²¹⁷ of the sample asserted to represent the reduction to practice and a corresponding report;²¹⁸ (2) testimony of an SK&F sample custodian regarding her receipt of a “legal sample” pursuant to company procedures;²¹⁹ (3) testimony of an SK&F lab director that “under his direction and according to routine,” samples received from Mr. Berges were assigned a particular SK&F designation;²²⁰ (4) testimony of an “immediate supervisee” of Mr. Berges regarding his synthesis, at Mr. Berges’s request, of starting materials intended for use in Mr. Berges’s attempt to synthesize the cephalosporin in question;²²¹ (5) testimony of an SK&F senior microbiology technician regarding her receipt of a sample from Mr. Berges and a subsequent *in vitro* assay of the sample, together with the corresponding report that had been attached to her lab notebook;²²² (6) the testimony of another SK&F microbiology technician who conducted *in vivo* testing of Mr. Berges’s sample regarding the results of the assay;²²³ and (7) testimony of Mr. Berges’s supervisor regarding his receipt—in his administrative role overseeing the study of cephalosporin compounds at the

v. Wong, 892 F.2d 1028, 1032 (Fed. Cir. 1989).

214. Like the senior party in *Lacotte*, refer to note 201 *supra*, Gottstein relied on its filing date. *See Berges*, 618 F.2d at 772.

215. *See Berges*, 618 F.2d at 776 (reversing the decision of the Board, and awarding priority to Mr. Berges).

216. The court indicated that Mr. Berges’s patent application was assigned to Smith-Kline Corporation, and referred to the mailing of a sample to “an *independent* Smith, Kline, and French (SK&F) analytical lab.” *See id.* at 772. However, the opinion indicates that Mr. Berges’s “immediate supervisee” and supervisor were employees of SK&F, and it appears that all of the witnesses who testified in support of Berges’s priority position were part of the SK&F organization. *See id.* at 773-74.

217. Elemental analysis is a standard analytical technique used to confirm the chemical identity of a sample. The technique determines the percentages of carbon, hydrogen, and nitrogen in a sample. This information is then compared with the chemical formula of the putative compound to determine whether the former is or is not consistent with the latter. *See* ROGER GRANT & CLAIRE GRANT, GRANT & HACKH’S CHEMICAL DICTIONARY 37-38 (5th ed. 1987); *see also Berges*, 618 F.2d at 772-73 (describing performance of “standard elemental analysis determining carbon, hydrogen, and nitrogen percentages[,]” and noting that a report of a second analysis “indicated ‘good’ agreement between the ‘Found’ and ‘Theoretical’ carbon, hydrogen, and nitrogen values expected” for the compound in question).

218. *See Berges*, 618 F.2d at 773.

219. *See id.*

220. *See id.* at 773 n.2.

221. *See id.* at 773.

222. *See id.*

223. *See id.* at 773-74.

SK&F research facility in question—of a legal sample from the custodian, a copy of the *in vitro* evaluation from the senior microbiologist, an interim report of the *in vivo* testing from the microbiology technician, and other summary and status reports regarding the compound in question.²²⁴ Each of these witnesses testified specifically as to the dates these events had occurred, and all of the dates, sample identification numbers, and procedures described were consistent with each other and with Mr. Berges's assertions.²²⁵

The court found that this evidence showed an established routine of organized research²²⁶ inside SK&F, and provided the requisite corroboration for Berges's asserted reduction to practice:

Equally relevant to the issue of corroboration of an actual reduction to practice are the routine pathways by which knowledge of ongoing research was disseminated throughout the cephalosporin research team. Berges did not simply decide by himself to synthesize a

224. See *id.* at 774.

225. See *id.* at 773-74.

226. See *id.* at 774. The significance of demonstrating that an alleged reduction to practice occurred as part of an organized program of research is apparent from case decisions. See, e.g., *Reese v. Hurst*, 661 F.2d 1222, 1230-31 (C.C.P.A. 1981) (holding applicant's evidence of reduction to practice as defective for lack of corroboration, specifically observing that the experiments in question "were not carried out in the ordinary course of an organized and supervised program of research conducted over an extended period of time"); *White v. Habenstein*, 219 U.S.P.Q. (BNA) 1213, 1218 (Bd. Pat. Int. 1983) (rejecting evidence of an asserted reduction to practice as insufficient, specifically noting that "there is no conclusive evidence of record which establishes that the so-called notebook pages were kept in the ordinary course of an organized program of research conducted over an extended period of time"). Interestingly, in at least one case, a party who was unable to establish the existence of an organized research program argued that the rule of reason discriminates against small start-up enterprises. See *Reese*, 661 F.2d at 1225-26 (discussing the junior party's argument that the Board "penalized" his company, which "was a fledgling company with no laboratory facilities, no employees and limited financial resources," and that he and his co-inventor "could not afford the luxury of having each and every step of their work independently corroborated by a third party"). According to the junior party, "[t]here [was] no reasonable basis for a rule of law which benefits larger organizations which can afford organized research facilities and penalizes private individuals and newly formed, fledgling companies, which cannot." *Id.* at 1226. The court rejected this argument as meritless, stating that the corroboration rule is based on the "paramount public policy of preventing fraud in patent procurement," a policy that "applies regardless of the size or financial resources of the party seeking a patent." *Id.* Judge Baldwin, concurring in the result in *Reese*, agreed that the company "did not have a systematic procedure for disseminating basic research data throughout a diverse corporate hierarchy." See *id.* at 1239 n.1 (Baldwin, J., concurring). However, in Judge Baldwin's view, work done by Mr. Reese's co-inventor, who was hired by Mr. Reese's company "to do specific experiments, with a particular goal in mind" constituted "an organized and supervised program of research." *Id.* (Baldwin, J., concurring).

compound He was involved in a supervised research program directed toward substituted cephalosporins.

. . . .

. . . .With all of the documentation briefly reviewed above, which consistently fits the affidavit evidence and planned activities of the members of the research team directed toward synthesis of T-ceph-A, we hold the production of T-ceph-A as and when asserted by Berges to be established by more than a preponderance of the evidence. He has therefore sustained his burden of proof and the corroboration required by patent law exists.²²⁷

The *Berges* court further referred to this type of corroborative evidence as a “cohesive web.”²²⁸

The Board and courts agree that the “[t]he rule of reason has eased the requirement of corroboration.”²²⁹ However, not every evidentiary showing passes muster under the rule of reason. Independent corroboration of evidence depending solely on the inventor(s) is still required.²³⁰ In addition, while the testimony of

227. *Berges*, 618 F.2d at 775. The court specifically rejected Gottstein’s argument that testimony of one who actually witnessed Berges’s reduction to practice was necessary. *See id.* at 776.

228. *See id.* at 775; *see also* *Hahn v. Wong*, 892 F.2d 1028, 1033 (Fed. Cir. 1989) (rejecting as insufficient evidence that which “does not create the cohesive ‘web of allegedly corroborative evidence’ found in *Berges*”). Another example of an “organized research endeavor” held to corroborate a reduction to practice is found in *Berry v. Webb*, 412 F.2d 261, 266-67 (C.C.P.A. 1969).

This approach to evaluating the sufficiency of corroborative evidence is consistent with a recent explanation of the “rule of reason” by the Board: “[T]he ‘rule of reason’ which governs our evaluation of the evidence does not require that conception be proved in detail by an unbroken chain of corroboration but rather that a reasoned determination be made as to the credibility of the inventor’s story.” *Kridl v. McCormick*, 105 F.3d 1446, 1449 (Fed. Cir. 1997) (quoting from the Board decision below).

229. *Ganguly v. Sunagawa*, 5 U.S.P.Q.2d (BNA) 1970, 1973 (Bd. Pat. App. & Int. 1987); *see also* *Coleman v. Dines*, 754 F.2d 353, 360 (Fed. Cir. 1985) (“This ‘rule of reason[]’ . . . was developed over the years in order to ease the requirement of corroboration”); *Reese*, 661 F.2d at 1225 (“In recent years, this court, by adopting a ‘rule of reason,’ has eased the requirement of corroboration with respect to the evidence necessary to establish the credibility of the inventor.”); *accord* *White v. Habenstein*, 219 U.S.P.Q. 1213, 1217 (Bd. Pat. Int. 1983).

230. *See, e.g., Mikus v. Wachtel*, 542 F.2d 1157, 1161-62 (C.C.P.A. 1976) (“That courts must review the record as a whole and must apply a rule of reason, when evaluating corroborative evidence of actual reduction to practice, does not dispense with the requirement for independent corroboration.”); *Horton v. Stevens*, 7 U.S.P.Q.2d (BNA) 1245, 1248 (Bd. Pat. App. & Int. 1988) (“Although adoption of the ‘rule of reason’ has eased the requirement of corroboration . . . it has not altered the requirement that corroborative evidence must not depend solely on the inventor himself, and must be independent of information received from the inventor.”); *see also* *Schendel v. Curtis*, 83 F.3d 1399, 1404 n.7, 1405 (Fed. Cir. 1996) (disagreeing with the Board’s conclusion that the inventor’s work was not part of an “organized

witnesses is valuable²³¹ and often necessary,²³² potential interference contestants, and others who may someday need to prove a date of invention,²³³ not surprisingly are concerned with

research endeavor," given the size of the company and the number of scientists with whom the inventor was involved, but nevertheless concluding that "a rule of reason analysis cannot overcome a lack of meaningful evidence that a claimed substance was obtained").

231. See, e.g., *Reese*, 661 F.2d at 1225 ("Independent corroboration may consist of testimony of a witness, other than the inventor, to the actual reduction to practice . . ."); *Allen v. Blaisdell*, 196 F.2d 527, 531 (C.C.P.A. 1952) (holding a reduction to practice to be corroborated by witness testimony, despite the absence of contemporaneous documentary evidence).

Of course, even the testimony of noninventor witnesses is insufficient if they derive their knowledge solely from the inventor. See, e.g., *Hahn*, 892 F.2d at 1032-33 (declaring the witness testimony submitted as corroboration of the inventor's testimony and notebook entries deficient because the witnesses' knowledge was derived from the inventor); *Larson v. Johanning*, 17 U.S.P.Q.2d (BNA) 1610, 1612 (Bd. Pat. App. & Int. 1990) (stating that a witness who testifies only to information provided by the inventor cannot corroborate the inventor's alleged reduction to practice). The Board's decision in *Anderson v. Crowther*, 152 U.S.P.Q. (BNA) 504 (Pat. Off. Bd. Pat. Int. 1965), exemplifies the pre-rule of reason application of this principle. The evidence in *Anderson* included the testimony of the inventor, his notebook entries (which were witnessed in a space marked "Experiment seen and understood by me"), and the testimony of the notebook witness. See *id.* at 506-07. The witness testified that he was working in the lab with the inventor at the time the work in question was completed and was familiar with and understood the chemical reaction, as well as the chemical and apparatus used, and had discussed the chemical analysis of the product with the inventor. See *id.* at 507. Despite this evidence, the Board found insufficient corroboration, in part because the Board viewed the witness's knowledge as derived from the inventor. See *id.* The reasoning in *Anderson* has been largely undercut by the abrogation of the requirement for "over the shoulder" corroboration. See, e.g., *Berges*, 618 F.2d at 776 (indicating that as long as there is a cohesive web of allegedly corroborative evidence, firsthand knowledge of the inventor's work is not necessary).

232. PTO interference rules require that "[t]he significance of documentary and other exhibits identified by a witness in an affidavit or during oral deposition shall be discussed with particularity by a witness." 37 C.F.R. § 1.671(f) (1998). This rule embodies the basic concept, which is well settled in patent law, that "exhibits do not ordinarily speak for themselves." *Hahn v. Wong*, 13 U.S.P.Q.2d (BNA) 1211, 1214 (Bd. Pat. App. & Int.), *aff'd*, 892 F.2d 1028 (Fed. Cir. 1989). For example, in *Hahn*, the inventor's evidence consisted of his testimony, pages from his laboratory notebook, and the testimony of two colleagues who testified that as of the critical date for establishing a reduction to practice of the invention at issue, they had "read" and "understood" the inventor's descriptions of his experimental work in his lab notebook. See *Hahn*, 892 F.2d at 1031. The Board and the Federal Circuit agreed that this evidence was insufficient to establish a reduction to practice under the rule requiring corroboration. See *id.* at 1032. The testimony of the witnesses established only that the notebook pages were in existence as of the critical date. See *id.* at 1033. The information contained in the notebooks itself, however, emanated solely from the inventor and, without some first hand knowledge, either of the alleged reduction to practice itself or of circumstances surrounding the alleged event, the witnesses' statements did not independently corroborate the statements made on the notebook pages. See *id.* at 1033-34.

233. The requirement for corroboration applies generally to an attempt to prove a pre-filing date of invention. Refer to note 9 *supra*. Thus, for example, an infringing defendant who seeks to invalidate its opponent's patent by showing,

creating and preserving documentary evidence of invention. Traditionally, the most common type of such evidence is the researcher's laboratory notebook, a form of evidence that has come to enjoy a special status in patent law.

C. *The Laboratory Notebook*

Researchers create and keep records of their research for a variety of reasons, for example, to meet internal reporting requirements,²³⁴ to satisfy regulatory authorities,²³⁵ and even to protect themselves against claims that they derived their ideas from others.²³⁶ However, for those interested in establishing patent rights in inventions, research records are primarily kept in anticipation of an eventual attempt to establish a date of invention.²³⁷

The classic example of a research record is the laboratory notebook.²³⁸ Notebooks are used to record ideas, observations, experimental protocols and results, and plans for further investigation. Traditionally, in commercial research laboratories, and more recently in academic and other nonprofit laboratories,

pursuant to 35 U.S.C. § 102(g), that it or a third party reduced the patentee's invention to practice before the patentee may, depending on the circumstances, have to provide corroborated proof, as will a patentee who seeks to establish a pre-filing date of invention to overcome an invalidity challenge.

234. See Gregory J. Battersby, *Inventions*, INTELL. PROP. STRATEGIST, Mar. 1996, at 2, 3 (recommending that employers impose a contractual obligation on employees to keep written notebook records of their work, "properly witnessed for use as invention records," to submit such records to the employer when requested or at the termination of the employee's services, and to report all inventions made by the employee during his or her term of employment to the employer).

235. See Stu Borman, *Electronic Laboratory Notebooks May Revolutionize Research Record Keeping*, CHEMICAL & ENGINEERING NEWS, May 23, 1994, at 10, 11 (noting the Food & Drug Administration requirements for record keeping).

236. See Edwin S. Flores Troy, *Publish and Perish: Patentability Aspects of Peer Review Misconduct*, 5 TEX. INTELL. PROP. L.J. 47, 68-69 (1996) (explaining that the absence of laboratory notebook entries may make determinations of malfeasance difficult).

237. See, e.g., Brian G. Brunsvold & William H. Pratt, *Intellectual Property Rights—What Are They and How Does a Company Secure Them?*, A.L.I.-A.B.A. 137, 146 (1996) ("Because of the potential for . . . 'interferences,' an employee should keep detailed records at all stages of the inventive process in order to establish the earliest possible date of invention. . . . The importance of recording or witnessing an invention cannot be emphasized strongly enough."); Dianne Callan, *Corporate Proprietary Procedures for Software*, 298 P.L.I./PAT. 549, 565 (1990) ("At the risk of sounding like a broken you-know-what, the three most important things you can do to protect your inventions are to keep records, keep records, and keep records.").

238. See, e.g., Stephen M. Bodenheimer, Jr. et al., *The Effect of the Interference Rule Revisions Enacted in Response to NAFTA and GATT*, 36 IDEA 19, 30 (1995) (noting that a number of companies provide laboratory notebooks to their research personnel); Callan, *supra* note 237, at 565-66 (providing guidelines on how to protect inventions by keeping an adequate laboratory notebook).

laboratory notebooks have been issued, used, and stored according to strict procedures²³⁹ designed to enhance their reliability and, accordingly, their potential evidentiary value.²⁴⁰

Researchers are typically given instruction regarding two aspects of how to keep research notebooks: (1) the substantive aspects of record keeping, such as the type of information to record and the level of detail required, as well as how such information should be characterized;²⁴¹ and (2) the procedures to employ to enhance the credibility of the records for purposes of potential future legal proceedings.²⁴² Traditionally, such procedures include the following:

The traditional laboratory notebook consists of bound, sequentially numbered pages, a feature that tends to reinforce the notion that no pages have been replaced or inserted.²⁴³ Researchers are traditionally taught to record entries sequentially, in permanent ink, without skipping space between entries.²⁴⁴ Correction of errors and other changes are to be made without erasing or obscuring the original entries.²⁴⁵ For example, deletions should be made by drawing a line through the information to be deleted and inserting the new information near the original entry.²⁴⁶ All entries, including concepts, observations, descriptions of actual experimental work, and all corrections or changes to those entries, are to be dated.²⁴⁷ Similarly, each entry

239. "[M]any companies have formal policies and practices aimed at recording their R&D work in a manner which will preserve the record as admissible evidence of the earliest date of invention." Brunsvold & Pratt, *supra* note 237, at 146 (advising corporate counsel to educate research and development personnel regarding record-keeping procedures).

240. See, e.g., Bodenheimer et al., *supra* note 238, at 28-31; Irving & Lewis, *supra* note 115, at 338-346 (providing detailed instructions on how to maintain laboratory records so that they can be admissible and effective); American Chemical Society, *Record Keeping Fact Sheet-A Guideline for Maintaining Research Records for Patent Purposes* (visited Mar. 5, 1999) <<http://www.acs.org/govt/pubs/5st45h.htm>>; National Technology Transfer Center, *How to Use Your Laboratory Notebook* (visited Feb. 3, 1999) <<http://www.nttc.edu/training/guide/sece05.html>>; Scientific Notebook Company, *Suggestions for Keeping a Laboratory Notebook* (visited Aug. 2, 1998) <<http://www.snco.com/instruction.htm>>.

241. See Irving & Lewis, *supra* note 115, at 338-39.

242. See *id.* at 339-43.

243. See, e.g., *id.* at 342 ("A bound notebook creates a presumption that the records have not been forged or altered by replacement or insertion of pages."); Scientific Notebook Company, *Proper, Proven Legal Format* (visited Feb. 3, 1999) <<http://www.snco.com/legal.htm>> (advertising permanently-bound laboratory notebooks that are "hard-bound" and "Smyth-sewn to avoid the problems of loose materials and lost or substituted pages").

244. See Irving & Lewis, *supra* note 115, at 342.

245. See *id.* at 343.

246. See *id.*

247. See *id.* at 342-43.

or page, including alterations (made in accordance with the above-described procedures) should be signed by the author, and “witnessed” (read, understood, and signed) by at least one person who is not likely to be an inventor, in the patent law sense, of the idea or work represented by the entry.²⁴⁸

Signing and witnessing research records obviously serve an authentication purpose. Moreover, in the context of patent interferences and other patent proceedings, these procedures provide additional assistance with identifying the people who are qualified to testify as first-hand witnesses to inventive activity.²⁴⁹ While it is not technically necessary to witness notebook entries made by persons who are not named as inventors on the patents or applications involved in an interference, because corroboration of such evidence is not required,²⁵⁰ it will not always be clear at the time experimental work is done precisely who will be the inventors of the subject matter at issue. Inventorship will be determined by the patent attorney or agent responsible for filing the patent application at the time the application is filed, and may even change during the course of the PTO’s examination of the application.²⁵¹ In addition, because of the requirement that the significance of documentary evidence be explained in

248. See *id.* at 339-40.

249. See *id.* at 340.

250. Refer to notes 147-49 *supra* and accompanying text.

251. Determining proper inventorship can be difficult even for experienced patent attorneys. See, e.g., W. Fritz Fasse, *The Muddy Metaphysics of Joint Inventorship: Cleaning Up After the 1984 Amendments to 35 U.S.C. § 116*, 5 HARV. J.L. & TECH. 153, 153 (1992) (“While it is clear that ‘inventors’ are to have exclusive patent rights in their discoveries, it has long been unclear exactly what characterizes an ‘inventor.’ Inventorship is especially difficult to define when several individuals have participated in a single invention.”); Nathan P. Letts, *Prosecuting Biotechnology Patent Applications*, in SEVENTH ANNUAL PATENT PROSECUTION WORKSHOP: ADVANCED CLAIM DRAFTING AND AMENDMENT WRITING 643, 682 (1997) (“Determining inventorship is often one of the most difficult issues in filing and prosecuting a patent application.”). Judge Newcomer, in *Mueller Brass Co. v. Reading Industries, Inc.*, 352 F. Supp. 1357 (E.D. Pa. 1972), described the task of determining inventorship as follows:

The exact parameters of what constitutes joint inventorship are quite difficult to define. It is one of the muddiest concepts in the muddy metaphysics of the patent law. On the one hand, it is reasonably clear that a person who has merely followed instructions of another in performing experiments is not a co-inventor of the object to which those experiments are directed. To claim inventorship is to claim at least some role in the final conception of that which is sought to be patented. Perhaps one need not be able to point to a specific component as one’s sole idea, but . . . it would have been less—less efficient, less simple, less economical, less something of benefit.

testimony,²⁵² it is preferable that notebook witnesses be knowledgeable about the subject matter involved.

Researchers are increasingly turning to computers for purposes of research record keeping.²⁵³ Records of experimental data and research reports can be conveniently prepared using word processing programs.²⁵⁴ Other computer programs are useful for creating and modifying graphical depictions, for example, of data, chemical structures, engineering diagrams, and the like.²⁵⁵ Electronic records may conveniently be searched, revised, reproduced, and shared with other researchers.²⁵⁶ In addition to electronic records created by researchers, such records are generated by a great variety of laboratory instrumentation,²⁵⁷ and such records may provide evidence critical to determinations of invention dates.²⁵⁸

Electronic research records, like other types of electronic records, are potentially vulnerable to data loss or corruption.²⁵⁹ Concerns relating to the accuracy, reliability, and permanence of

Mueller Brass Co. v. Reading Indus., Inc., 352 F. Supp. 1357, 1372 (E.D. Pa. 1972).

252. Refer to note 232 *supra*.

253. See American Chemical Society, *Electronic Record-Keeping for Patent Purposes, Cautions and Pitfalls* (visited Mar. 8, 1999) <<http://www.acs.org/govt/pubs/sst45g.htm>> [hereinafter ACS Pamphlet]; see also Bodenheimer et al., *supra* note 238, at 31 (recommending computer record-keeping procedures as a supplement to written records); Curtis G. Rose, *PropLaw™: IBM's Automated Invention Disclosure Processing System*, COMPUTER LAW, Jan. 1993, at 25, 25 (describing IBM's computerized invention-disclosure process).

254. See ACS Pamphlet, *supra* note 253.

255. See, e.g., Cambridge Soft, *About the ChemOffice Plugins* (visited Mar. 19, 1999) <<http://www.camsoft.com/plugins>> (advertising chemical structure drawing).

256. See, e.g., ACS Pamphlet, *supra* note 253; Dessy, *supra* note 20, at 428A-33A. For some researchers, the development of an electronic laboratory notebook system is part of a larger effort to facilitate collaboration by researchers at different locations. See Mark Crawford, *DOE Unveiling Drive to Crack Blocks to Remote Collaboration*, NEW TECH. WK., Mar. 3, 1997, available in 1997 WL 8521302 (describing the efforts of the Department of Energy to facilitate collaborative research).

257. See, e.g., ACS Pamphlet, *supra* note 253.

258. See, e.g., Berges v. Gottstein, 618 F.2d 771, 775 (C.C.P.A. 1980) (NMR (nuclear magnetic resonance) and IR (infrared) spectra); Grove v. Johnson, 22 U.S.P.Q.2d (BNA) 1044, 1048 (Bd. Pat. App. & Int. 1991) (IR scan and GLC (gas liquid chromatograph)); Hoffman v. Schoenwald, 15 U.S.P.Q.2d (BNA) 1512, 1513 (Bd. Pat. App. & Int. 1990) (proton NMR); De Solms v. Schoenwald, 15 U.S.P.Q.2d (BNA) 1507, 1509 (Bd. Pat. App. & Int. 1990) (elemental analysis, proton NMR, carbon 13 NMR and HPLC (high performance liquid chromatography)); Hahn v. Wong, 13 U.S.P.Q.2d (BNA) 1211, 1213 (Bd. Pat. App. & Int.), *aff'd*, 892 F.2d 1028 (Fed. Cir. 1989) (infrared spectroscopy, differential scanning calorimetry, gel permeation chromatography, nuclear magnetic resonance, and thermal gravimetric analysis).

259. Refer to notes 36-38 *supra* and accompanying text. See also ACS Pamphlet, *supra* note 253 (identifying the risks involved in using computer-based notebooks as compared to traditional notebooks).

electronic research records are heightened because of the strict evidentiary requirements applicable to records relied upon as evidence of invention.²⁶⁰

V. CREATING AND MAINTAINING RELIABLE ELECTRONIC PROOF OF PRIORITY

A. *Attributes of Reliable Electronic Record-Keeping Systems*

There are no reported cases discussing the evidentiary sufficiency of laboratory notebooks kept in electronic form. However, it is important to recognize that machine-generated reports and data have been admitted as evidence and relied upon to support proof of invention in interference and other patent proceedings for many years.²⁶¹ Thus, the use of such evidence, even in patent interference proceedings, is not new. Furthermore, there is nothing about the technology available for creating electronic laboratory notebooks²⁶² to suggest that such records are inherently more or less reliable than the other types of machine-generated evidence used in patent proceedings to date.

Nevertheless, just as researchers use specialized tools and follow particular procedures when keeping traditional paper

260. See ACS Pamphlet, *supra* note 253. Refer to note 23 *supra*. Such concerns have led some to conclude that a conservative, hybrid approach, in which electronic notebook entries are printed, witnessed, signed, and collected in a notebook, is prudent. See, e.g., Borman, *supra* note 235, at 12-13 (describing Pillsbury's use of such a "partially-electronic system"); Irving & Lewis, *supra* note 115, at 346 ("[I]t might still be preferable to print out hard copies of [research] records, and have the hard copies signed and witnessed like any other notebook entry. The printout should be attached permanently to a notebook or otherwise bound into permanent volumes."); see also Bodenheimer et al., *supra* note 238, at 31 (stating that "it is strongly recommended that records of the key dates and activities in an invention process, such as the dates of conception and reduction to practice . . . , should be maintained in conventional written notes . . . and, if desired, supplemented by computer records").

261. Refer to note 258 *supra* (recounting the types of instrument-generated documentary evidence considered in interferences).

262. A number of electronic laboratory notebook software packages are available or under development. See, e.g., McNamara, *supra* note 23, at 4 (describing the "Virtual Notebook," a "computer-based laboratory notebook"); *New Alliance Formed to Strengthen Laboratory Notebook Applications in Research*, BIOTECH EQUIPMENT UPDATE, Mar. 1, 1995, available in 1995 WL 8110931 (reporting the formation of a strategic alliance for the purpose of developing a "new generation" of laboratory notebooks); Jacek Gwizdka et al., *EEN: A Pen-based Electronic Notebook for Unintrusive Acquisition of Engineering Design Knowledge* (visited Feb. 1, 1999) <http://www.ie.utoronto.ca/EIL/DITL/WETICE96/EEN/EEN_WetIce96.html>; R. Lysakowski, *Driving Creation and Acceptance for Collaborative Electronic Notebooks* (last modified Sept. 11, 1997) <<http://www.che.chalmers.se/acs-lv-97/cinf-54.html>>.

laboratory notebooks, steps must be taken to insure the accuracy, reliability, and permanence of electronic laboratory notebooks. Because the Board and the courts are accustomed to evaluating the evidentiary sufficiency of paper laboratory notebooks, and because most of today's researchers have been exposed to traditional scientific record-keeping techniques and procedures, it is helpful to consider the rationales underlying standard scientific record-keeping procedures such as signing, dating, and witnessing when considering features and procedures for electronic laboratory notebook systems.

1. *Author's Signature.* Few cases specifically discuss the significance and function of the signature of the notebook entry's author.²⁶³ Nevertheless, the cases, taken together, provide guidance.

First, interference proceedings have been decided in favor of parties who have submitted no written or tangible evidence.²⁶⁴ It is possible, therefore, to establish a date of invention without signed notebook entries,²⁶⁵ and thus it is not *critical* that notebook entries be signed. Furthermore, signed notebook entries do not, by themselves, assure victory. Traditional laboratory notebook entries signed only by an inventor provide no independent verification regarding the information recorded therein.²⁶⁶

263. In research organizations, notebooks are typically kept by many people involved in the research process, including scientists, technicians, and analytical personnel. *See, e.g., Berges*, 618 F.2d at 772-73 (describing notebooks kept by chemists); *Berry v. Webb*, 412 F.2d 261, 263-66 (C.C.P.A. 1969) (detailing notebook entries made by scientists). As noted above, at the time research entries are made, these people may be unaware of their status as potential inventors and most likely have not yet been identified as witnesses who will be called upon to testify in an interference or other proceeding. Refer to notes 250-51 *supra* and accompanying text. Their notebook entries, however, may someday be used as evidence in either circumstance. Accordingly, this discussion is not limited to inventors' signatures.

264. *See, e.g., Allen v. Blaisdell*, 196 F.2d 527, 529, 531 (C.C.P.A. 1952) (awarding priority based on the testimony of the inventor and seven corroborating witnesses in a situation in which "[n]o documentary evidence in the form of notations made at the time [the invention was made] was introduced"); *McBride v. Acord*, 201 U.S.P.Q. (BNA) 549, 551 (Bd. Pat. Int. 1977) (specifically rejecting the argument that "tangible evidence" was required to verify the corroborating witnesses' testimony); *see also Donahue v. Baudry*, 223 U.S.P.Q. (BNA) 823, 827 (Bd. Pat. Int. 1984) (stating, in dicta, that sufficient corroboration was provided by the testimony of the inventor's technician, alone).

265. *See, e.g., Blicharz v. Hays*, 496 F.2d 603, 605-06 (C.C.P.A. 1974) (commenting that the notebook was unsigned and unwitnessed, but finding sufficient corroboration in other evidence).

266. *See, e.g., Searle v. Glarum*, 179 F.2d 974, 976 (C.C.P.A. 1950) (agreeing with the Board that "notebook records prepared by [the inventor] are merely self-serving documents, which, standing alone, do not effect . . . corroboration"); *Reed v.*

Obviously, however, signatures perform several important functions, including providing a basis for authenticating entries and connecting entries with their authors. Authentication may be particularly important in an interference in which the author has died prior to the proceeding or is otherwise unavailable.²⁶⁷ In patent matters, the “connecting” function of signing has special significance because the signature serves to distinguish the records of the inventor that will be treated as “self-serving”²⁶⁸ from those of noninventors which may provide corroboration for the inventor’s testimony.²⁶⁹ In addition, the Board and courts are accustomed to seeing signed notebook entries.

For these reasons, an electronic notebook system should incorporate some type of author identification or signature feature. In fact, “signing” in the electronic environment presumably has greater significance than in the traditional paper notebook system, in which entries are customarily made in the author’s handwriting.²⁷⁰ Thus, procedures or system requirements should be incorporated into electronic laboratory notebook systems to ensure that a record’s author documents his or her work promptly and regularly “signs” notebook entries.

Cislak, 175 F.2d 972, 974 (C.C.P.A. 1949) (“[W]e have held many times that [an inventor’s notebook] record and reports sent to others are not of themselves alone sufficient to establish corroboration, for the reason that they are in the category of self-serving declarations.”). *But see* Ritter v. Rohm & Haas Co., 271 F. Supp. 313, 320-21 (S.D.N.Y. 1967) (treating an inventor’s signed notebook as corroboration for his testimony and authority to the contrary as non-controlling).

267. *See, e.g.*, Anderson v. Pieper, 442 F.2d 982, 983-84 (C.C.P.A. 1971) (evaluating samples of dead witness’s handwriting).

268. Refer to note 266 *supra* and accompanying text (noting that inventor’s records do not provide independent verification the information recorded).

269. *See* Holmwood v. Sugavanam, 948 F.2d 1236, 1239 (Fed. Cir. 1991) (rejecting the argument that the testimony of a noninventor requires corroboration).

270. However, even in the electronic environment, it is possible to authenticate records by confirming characteristics of an individual’s handwriting. For example, PenOp, Inc., markets software that helps to verify who authored specific documents. *See Chemical Firms Secure Data with Electronic Signatures*, DOCUMENT IMAGING REP., Apr. 2, 1997, at 5 [hereinafter *Chemical Firms*]; Ken Phillips, *Unforgettable Biometrics*, PC WK., Oct. 27, 1997, at 95, 122. The software works in combination with a digitizing tablet such as a Wacom Technology’s “PenPartner.” *See id.* The PenOp system is a “biometric” authentication technique, in that it uses “digital technology to identify individuals based on their physical characteristics.” Bob Violino, *Body Language*, INFORMATIONWEEK, Aug. 18, 1997, at 36, 36. It measures such characteristics as letter size and writing speed, evaluating signatures 42 different ways to verify a record’s author. *See Chemical Firms, supra*, at 5. If the signature is valid, the PenOp system ties it to the document, preventing someone from scanning the signature and moving it to another document, or to a modified version of the original. *See id.* Refer to notes 276-77 *infra* and accompanying text (discussing other biometric identification techniques).

There are a number of electronic record identification technologies²⁷¹ that research organizations could use to connect a record with its author. These technologies are thus capable of performing the “signature” function in an electronic laboratory notebook system. With existing technologies, authors can be identified based on “something [they] know, something [they] have, or something [they] are.”²⁷² Passwords and user ID’s are common, relatively unsophisticated examples of “something you know.”²⁷³ Digital signatures, which can be used to verify both the author and content of a record, are another, more complicated, example.²⁷⁴ “Something you have” technologies depend upon identification devices, such as passcards, tokens, and “smart cards,” provided, for example, by systems administrators to authorized users.²⁷⁵ Biometric identification techniques are examples of “something you are” identification technologies in that they identify authors based on physical characteristics.²⁷⁶ Biometric techniques include fingerprint identification, iris and retinal scans, and recognition systems based on hand-geometry

271. Brief descriptions of various technologies are provided herein only to suggest that there are a number of potential technical features that may be incorporated into an electronic notebook system to parallel the traditional signature, dating, and witnessing procedures. Some of the technologies discussed herein are included or under consideration for inclusion in various electronic laboratory notebook systems or electronic research record management systems. No endorsement of any particular technology is intended. In fact, the discussion of available technologies is not intended to suggest that any particular system features or procedures, or level of technological sophistication, are necessary or sufficient to satisfy the requirements for proving a date of invention. Consistent with the rule of reason, all that should be required of electronic evidence is the reasonable certainty attainable with paper records. Given the concerns that have been expressed regarding establishing a date of invention with electronic records, refer to note 23 *supra* and accompanying text, it is reasonable to assume that some research organizations will err on the side of caution and adopt systems and procedures intended to assure better-than-reasonable certainty. The Board and the courts, however, should resist any tendency to require more assurance of reliability from electronic records than they have required of paper records. For the potential proponents of electronic record evidence, it is also worth noting the risks associated with adopting procedures that are too complicated or exacting to be followed routinely. Any failure by the proponent to observe its own procedures is likely to provoke a challenge on the ground that the proponent’s electronic records are not sufficiently reliable to be admitted or credited.

272. Don Elledge, *Keep Out Prying Eyes*, INFORMATIONWEEK, May 5, 1997, at 102, 103.

273. *See id.*

274. *See id.* at 104. Digital signatures can also be incorporated into more sophisticated “something you have” technologies. *See id.*; *see also* Andrew Cray, *Who Goes There?*, DATA COMM., Nov. 1997, at 87, 89.

275. *See* Cray, *supra* note 274, at 89-90 (comparing the security advantages of tokens and smart cards).

276. *See* Violino, *supra* note 270, at 38 (stating that the fingerprint-ID is the most advanced of the biometrics technologies).

and facial characteristics.²⁷⁷ Whatever technical authentication feature is employed, researchers should “sign” their electronic records promptly—preferably as those records are created.

2. *Dating Notebook Entries.* Obviously, a fundamental purpose of research records is to aid in establishing *when* certain events occurred—for example, to establish priority of invention in a patent interference,²⁷⁸ or to determine whether certain information is or is not prior art.²⁷⁹ Undated notebook entries, whether traditional or electronic, are of little value, at least for purposes of proving invention dates. Consequently, an accurate, automatic²⁸⁰ means of “date-stamping” entries is a necessary feature of an electronic research notebook system.

Date or date/time-stamping capabilities can be incorporated into an organization’s document management system for the purpose of establishing when particular records were created.²⁸¹ Assuming a foundation can be laid to establish the accuracy and reliability of the stamping feature, the dates stamped on particular records should be fully credited.²⁸²

A significantly higher level of reliability can be achieved using “digital notary” or “surety” services in which third parties

277. See, e.g., Laurie Ann Peach, *Biometrics Moves from the Big Screen to Real Life*, LASER FOCUS WORLD, Nov. 1997, at 109, 109-10. According to Ms. Peach, “[o]ther biometric technologies that are in development include body-odor identification, in which the ‘scent’ of a hand can be digitally recorded, signature verification, wrist-vein recognition, and even keystroke dynamic recognition, or how a person types.” *Id.* at 112. For example, MDL Information Systems of San Leandro, California, markets document management software to chemical companies that desire to record laboratory data electronically. See *Chemical Firms*, *supra* note 270, at 5. The software employs PenOp, a signature verification product, for record authentication. See *id.* (“Signature verification is attractive to pharmaceutical companies because they are used to authenticating [sic] paper records by signing them.”).

278. Refer to note 237 *supra* (discussing the significance of research records in establishing a date of invention).

279. Refer to note 9 *supra* (describing cases in which research records were used to determine whether information was or was not prior art).

280. Organizations can enhance the credibility and, thus, the evidentiary value of electronic research records by exercising control over the date function. Depriving researchers of control over the dating of records obviously limits the potential for manipulation.

281. See Charles R. Merrill & W. Scott Stornetta, *Time-Stamping Makes Digital Signatures Reliable*, NAT’L L.J., June 9, 1997, at B15 (“[A] research and development operation can implement a system of routine time-stamping of each researcher’s laptop notes every week, day or hour.”).

282. Cf. *English v. Ausnit*, 38 U.S.P.Q.2d (BNA) 1625, 1629 (Bd. Pat. App. & Int. 1993) (stating that the dates appearing in exhibits “will not be taken as true and must be proved by the testimony of someone other than the inventors or by other evidence independent of the inventors”).

certify that individual records existed as of certain times and have not been altered in the interim.²⁸³

3. *Alteration of Notebook Entries.* The established notebook-keeping procedures described above²⁸⁴ are designed, in part, to ensure that alterations are apparent or at least detectable.²⁸⁵ Because of the great concern in interference proceedings for truthful, reliable evidence, an electronic notebook system should also incorporate features that keep track of any manipulations or alterations of original records and preserve intermediate versions.

As noted above, digital signature and digital notary technologies can be used to verify that records have not been altered.²⁸⁶ Other "audit trail" technologies exist to track system access and record alteration attempts.²⁸⁷

4. *Witnessing Notebook Entries.* Should an electronic notebook system incorporate a witnessing feature? If so, how should such a feature be implemented? Again, a review of the principles that emerge from the cases involving traditional paper laboratory records is helpful.

283. See, e.g., Charles R. Merrill, *The Digital Notary™ Record Authentication System—A Practical Guide for Legal Counsel On Mitigation of Risk From Electronic Records* (visited Feb. 1, 1999) <http://www.surety.com/in_news/legalid.html>. Mr. Merrill notes:

To provide irrefutable evidence of priority of invention, particularly when the invention must remain secret, the Digital Notary Record Authentication System is a method of freezing both the WHAT and WHEN of each page of digital looseleaf laboratory notebooks. This could allow inventors to complete the transfer of all their work from sewn-page paper notebooks to PCs with increased rather than diminished time-date credibility.

Id.; see also Merrill & Stornetta, *supra* note 281, at B15 (discussing a "time-freezing" certification process that "unassailably" verifies both the time of creation and the content of the record at the time of creation, and its particular potential utility for time-stamping research and development records); *Protect the Validity of Your Corporate Documents*, ELECTRONIC COM. NEWS, Jan. 27, 1997, available in 1997 WL 7942978 (describing Surety Technologies' Digital Notary Service, which "fingerprints" individual records and certifies their existence and integrity by linking them with other records certified at the same time and by publishing validation information (but not the certified records themselves) weekly in the *New York Times*).

284. Refer to notes 243-48 *supra* and accompanying text.

285. See generally Irving & Lewis, *supra* note 115, at 342-43.

286. Refer to notes 274, 283 *supra* and accompanying text.

287. See, e.g., Braintree Technology, Inc., *SQL Secure* (visited Feb. 8, 1999) <<http://www.sybase.com/partners/code/cpis/888.html>> (describing database auditing software that can manage and manipulate audit trail data); *Electronic Notebook in Scientists' Future*, NEW TECH. WK., Feb. 18, 1997, available in 1997 WL 8521298 (describing efforts to develop a World Wide Web-based electronic notebook system "that will secure entries with data locks and date stamps").

Consistent with both the “rule of reason”²⁸⁸ and the fraud prevention policy underlying the requirement for corroboration,²⁸⁹ notebook witnessing is neither essential²⁹⁰ nor necessarily sufficient²⁹¹ in every case to establish priority of invention. The cases clearly hold that each case is to be decided on its own facts, and the evidence in each is to be viewed as a whole.²⁹²

As in the case of paper laboratory notebooks, a witnessing feature offers several benefits in the electronic environment. The electronic “signature” of a noninventor on a record, assuming the electronic notebook system can be shown to

288. Refer to Part IV.B.3 *supra* (explaining the “rule of reason” for evaluating the sufficiency of corroborating evidence).

289. Refer to notes 145-46 *supra* and accompanying text.

290. For example, the relevant notebooks in *Berges v. Gottstein*, 618 F.2d 771 (C.C.P.A. 1980) were unwitnessed. *See id.* at 772. Nevertheless, the court held that evidence of independent chemical analyses and “routine pathways” for dissemination of information among research team members was sufficient corroboration for the inventor’s testimony regarding his reduction to practice. *See id.* at 775. In another case, the testimony of a witness who observed some of the testing in question, together with a “Record of Invention” report and a subsequent patent application, was regarded as adequate to corroborate the inventor’s testimony, in spite of the fact that the inventor’s notebook was unsigned and unwitnessed. *See Blicharz v. Hays*, 496 F.2d 603, 604-06 (C.C.P.A. 1974).

291. For example, the signature of a witness who lacks independent knowledge of the work in question, without more, is insufficient to corroborate the inventor’s testimony. *See, e.g., Hahn v. Wong*, 892 F.2d 1028, 1033 (Fed. Cir. 1989); *see also Coffman v. Ellis*, 205 U.S.P.Q. (BNA) 773, 776 (Bd. Pat. Int. 1979) (holding that a notebook witness need not necessarily have observed the reduction to practice, but in the absence of testimony regarding what the witness independently knew or saw, his knowledge must be regarded as derived from the inventor); *accord Getsinger v. Young*, 164 U.S.P.Q. (BNA) 659, 663 (Pat. Off. Bd. Pat. Int. 1969).

Thus, merely having a witness sign a space that says “read and understood” will not provide the desired corroboration of an actual reduction to practice if that is all the witness does or knows. *See, e.g., Hahn*, 892 F.2d at 1033. Precisely how much knowledge or understanding is required of the witness is not clear. Prior to general application of the rule of reason, witnesses were generally required to have personally observed the reduction to practice and have personal knowledge of the results of the experimental work. *See, e.g., Anderson v. Crowther*, 152 U.S.P.Q. (BNA) 504, 508 (Pat. Off. Bd. Pat. Int. 1965). Today, a witness who shares a workspace with an inventor and in whose presence related work has been carried out may have sufficient knowledge to corroborate the inventor’s work. *See Grasselli v. Dewing*, 534 F.2d 306, 311 (C.C.P.A. 1976). In the words of the *Grasselli* court:

The dated signature, on a notebook page, of a witness *sufficiently familiar with the particular field of technology to understand what is described on that page* is evidence, under a rule of reason, upon which one may find corroboration, especially where, as here, that admittedly authentic page was kept in the ordinary course of an organized program of research conducted over an extended period of time.

Id. (emphasis added); *accord Donohue v. Baudry*, 223 U.S.P.Q. (BNA) 823, 827 (Bd. Pat. Int. 1984).

292. Refer to Part IV.B.3 *supra*.

reliably detect or prevent alterations to a record, once created, will corroborate the record's existence as of the date of the witness's signature.²⁹³ If such a record describes a "definite and permanent idea of the complete and operative invention,"²⁹⁴ the witness's "signature" will itself corroborate conception of an invention.²⁹⁵

As noted above, witnessed notebooks and invention disclosures serve a practical, as well as a legal, purpose in marshalling evidence of invention.²⁹⁶ They can be used to identify the persons knowledgeable about relevant events and, therefore, the appropriate persons to interview and from whom one should obtain testimony once a legal proceeding is anticipated.²⁹⁷ This is especially true when a significant period of time has passed between the reduction to practice of the invention and the discovery and testimony periods²⁹⁸ of the interference proceeding, or when there have been changes in the structure of the organization or the physical location of researchers. These legal and practical benefits make incorporation of a witnessing feature in an electronic notebook system desirable.

One way to incorporate a witnessing feature into an electronic laboratory notebook system is to provide for "signature" or authentication by one or more persons in addition to a record's creator. The authentication technologies

293. See, e.g., *Hahn*, 892 F.2d at 1033.

294. *Coleman v. Dines*, 754 F.2d 353, 359 (Fed. Cir. 1985) (quoting *Gunter v. Stream*, 573 F.2d 77, 80 (C.C.P.A. 1978)).

295. Refer to notes 308-11, 315-20 *infra* and accompanying text (explaining the date-stamping and content verification features that can be incorporated into electronic notebooks).

296. Refer to notes 249-52 *supra* and accompanying text.

297. Electronic record-keeping systems, with their indexing and search capacities, would presumably have a significant advantage over their paper counterparts with respect to this particular function.

298. Pursuant to the Rules of Practice in Patent Cases, PTO interference proceedings are divided into a series of phases, or periods. See 37 C.F.R. §§ 1.601-1.690 (1998). These include the preliminary motions period, "time for filing motions for additional discovery," and "testimony periods for taking any necessary testimony." *Id.* §§ 1.636, 1.651(a). Interferences are not declared until a patent examiner determines that two or more applications (or at least one application and one unexpired patent) contain interfering subject matter which is patentable to the applicants. See *id.* §§ 1.603, 1.606. As a result, interferences are declared following the PTO's determinations of patentability, during *ex parte* prosecution, in each of the applications at issue. Once declared, the average pendency of an interference proceeding through final hearing is estimated to be four to five years. See Charles L. Gholz, *Letters to the Editor*, 77 J. PAT. [& TRADEMARK] OFF. SOC'Y 825, 825 (1995). Accordingly, the time period between research activities relied upon for proof of a date of invention and the time testimonial affidavits are prepared and filed can easily exceed five years.

described above could be employed for this purpose, keeping in mind that a witnessing feature should, at a minimum, establish that someone other than the record's creator was aware of the record's existence at the time that he or she "witnessed" it.²⁹⁹

B. *Electronic Proof of Conception vs. Reduction to Practice*

Although the requirement for corroboration and the "rule of reason" apply to all types of inventive activity—conception, reduction to practice, and reasonable diligence³⁰⁰—the act of conception is inherently different from acts relied on as proof of reduction to practice or diligence. As discussed below, these differences translate into differences in the nature of proof necessary for corroboration and, therefore, to establish dates of invention. The differences have interesting implications for the use of electronic record-keeping systems for research records.

1. *Inherently Different Nature of Events to Be Proven.* As discussed above, conception is the "mental" part of inventing.³⁰¹ Once an inventor has formed in his or her mind "a definite and permanent idea of the complete and operative invention, as it is thereafter to be applied in practice[.]" conception has occurred.³⁰² However, because conception occurs inside the mind of an inventor and because proof of a purely mental event obviously depends entirely on the veracity of the inventor, the law does not consider conception to be complete until the inventor has somehow manifested his thoughts in a verifiable way.³⁰³ Furthermore, this manifestation must be in the form of a contemporaneous disclosure that would "*enable those skilled in the art to make the invention.*"³⁰⁴ In the words of one court, once conception has occurred, "[a]ll that remains to be accomplished, in order to perfect the act or instrument, belongs to the department of construction, not invention."³⁰⁵

299. Refer to note 293 *supra* and accompanying text.

300. Refer to notes 132-34 *supra* and accompanying text.

301. Refer to notes 111-12 *supra* and accompanying text.

302. *Coleman v. Dines*, 754 F.2d 353, 359 (Fed. Cir. 1985).

303. *See id.* (explaining that conception must be proven by corroborating evidence showing the inventor's disclosure of the idea to others).

304. *Id.* (quoting *Field v. Knowles*, 183 F.2d 593, 601 (C.C.P.A. 1950)) (emphasis added). The sufficiency of a disclosure asserted to constitute the manifestation of a conception is evaluated according to the standards for enablement of a patent specification. *See* 3 DONALD S. CHISUM, CHISUM ON PATENTS § 10.04[3], at 10-93 (1998) (citing *Spero v. Ringold*, 377 F.2d 652, 660 (C.C.P.A. 1967)).

305. *Mergenthaler v. Scudder*, 11 App. D.C. 264, 276 (1897).

Accordingly, “[t]he conception analysis necessarily turns on the inventor’s ability to describe his invention with particularity. Until he can do so, he cannot prove possession of the complete mental picture of the invention.”³⁰⁶

Manifestation is a separate requirement from corroboration in that the proponent of a date of conception must both prove the manifestation (*i.e.*, the act of disclosing the conception) and corroborate the manifestation with evidence independent of the inventor.³⁰⁷ At one time, it was required that the manifestation take the form of a disclosure to another person.³⁰⁸ However, this requirement was recognized as overly inflexible nearly a century ago.³⁰⁹ Despite some language in recent opinions suggesting that disclosure to another person is still required,³¹⁰ it is clear that manifestation in the form of a written disclosure, in which the existence of the writing can be corroborated as of a certain date, is sufficient to establish conception.³¹¹

Reduction to practice and diligence are inherently different from conception in that efforts to prove that a reduction to practice has occurred, or to establish that a party has exercised reasonable diligence over a period of time, involve proof that particular activities—physical events—have occurred. For example, if the nature of the invention is such that testing is required to establish its utility,³¹² it is necessary to show that the testing was carried out as of, or prior to, a particular date.³¹³ As a result, it is well settled that proof—even corroborated proof—that a record existed as of a certain date does not establish that the

306. *Burroughs Wellcome Co. v. Barr Lab., Inc.*, 40 F.3d 1223, 1228 (Fed. Cir. 1994).

307. *See Garascia, supra* note 104, at 741.

308. *See Peters v. Hopkins*, 34 App. D.C. 141, 144 (1909) (noting that supporting evidence of conception “must ordinarily consist of disclosures of the invention, as conceived, to others”).

309. *See id.* at 144-45 (“It is quite true that this supporting evidence must ordinarily consist of disclosures of the invention, as conceived, to others. . . . [H]owever . . . there may be cases in which conception can be established by other means than the disclosures referred to.”).

310. *See, e.g., Coleman v. Dines*, 754 F.2d 353, 359 (Fed. Cir. 1985) (“Conception must be proved by corroborating evidence which shows that the inventor disclosed to others his ‘completed thought . . .’”); *accord Northern Telecom Inc. v. Datapoint Corp.*, 9 U.S.P.Q.2d (BNA) 1577, 1623 (N.D. Tex. 1988), *aff’d in part, rev’d in part on other grounds*, 908 F.2d 931 (Fed. Cir. 1990).

311. Refer to note 176 *supra*.

312. Refer to note 116 *supra* (discussing whether an invention must be tested to establish reduction to practice).

313. Refer to note 129 *supra*.

activity described therein actually happened as of that date or even happened at all.³¹⁴

2. *Implications for Electronic Laboratory Notebook Systems.* To establish conception by showing that a written manifestation of the conception existed as of a certain date, it has been necessary, in the paper environment, to establish the requisite corroboration through the testimony or records of another (noninventor) person.³¹⁵ In contrast, the incorporation of reliable date-stamping and content-verification features into an electronic laboratory notebook system enables the computer, itself, to corroborate the existence of an intact record as of the date stamped thereon.³¹⁶ Thus, for proof of conception, the computer can serve as the witness.

For example, suppose that PharmCo is a major pharmaceutical company engaged in the search for new drugs. For several months, physicians have been prescribing PharmCo's new FDA-approved cold remedy, "Nocoffital." PharmCo pharmacologists have been carefully monitoring comments and reports from patients taking Nocoffital for any evidence of side effects or other relevant information. In particular, the PharmCo scientist responsible for the Nocoffital project, Dr. R.D. Fisher,³¹⁷ has been receiving reports that Nocoffital, in addition to alleviating cold symptoms, has been modifying patient mood and behavior. It occurs to Dr. Fisher, based on these reports, to investigate the potential of Nocoffital and related compounds for anti-psychotic activity. Based on the chemical structure of

314. See *Hahn v. Wong*, 892 F.2d 1028, 1033 (Fed. Cir. 1989) (holding that affiants' statements that they had "read and understood" particular pages of the inventor's laboratory notebook by a certain date did not corroborate an alleged reduction to practice because "they established only that those pages existed on a certain date [and] they did not independently corroborate the statements made on those pages"); see also *White v. Habenstein*, 219 U.S.P.Q. (BNA) 1213, 1218 (Bd. Pat. Int. 1983) (finding that a stipulation delineating what notebook entries purport to record does not equate to a stipulation that the researcher actually performed or personally observed the work recorded on those pages).

315. See, e.g., *Kridl v. McCormick*, 105 F.3d 1446, 1450-51 (Fed. Cir. 1997) (holding that an inventor's testimony regarding conception of the invention was corroborated by the description of the invention in the notebook—itsself witnessed—of the inventor's subordinate); *Price v. Symsek*, 988 F.2d 1187, 1195 (Fed. Cir. 1993) (rejecting the argument that a witness who can establish that a document relied upon as proof of conception existed as of a particular date must also testify that she understood its content or had it explained to her).

316. Refer to notes 281-83 *supra* and accompanying text.

317. For the purpose of this hypothetical, Dr. Fisher is part of an organized program of research at PharmCo. Refer to notes 209-28 *supra* and accompanying text (discussing organized research programs).

Nocoffital, Dr. Fisher proposes a series of compounds for synthesis by PharmCo chemists and for pharmacological evaluation.

Contemporaneous with his ideas, he creates an electronic laboratory notebook entry in which he sets forth complete chemical structures for the compounds he proposes for testing, together with synthetic routes for preparing each compound, and a notation to test the compounds for central nervous system activity, specifically anti-psychotic activity. He electronically "signs" the entry in accordance with PharmCo company procedures, and the system automatically date-stamps the record.

Assuming PharmCo can demonstrate that the content of the record has not been altered (for example, via an audit utility or digital signature technology³¹⁸), the computer itself establishes that Dr. Fisher's notebook entry existed as of the date electronically "stamped" on the record. The entry "speaks for itself,"³¹⁹ and, because it contains a legally sufficient conception of the compounds described therein,³²⁰ no further corroboration for Dr. Fisher's conception should be required. The computer has, in effect, "witnessed" the conception. Here, then, electronic notebook systems enjoy an advantage over paper systems.

Proof of a reduction to practice, however, is another matter. Suppose that several months later, it appears from *in vitro* studies that one of the compounds Dr. Fisher proposed has significant anti-psychotic activity. Based on those positive preliminary results, Dr. Fisher then evaluated the *in vivo* efficacy of the compound, named "Nocaratol," using a standard animal testing model. The animal test in question is a standard screen for anti-psychotic activity. Basically, it involves injecting a group of very agitated rats with a solution of the test compound (in this case, Nocaratol), and observing the subjects at regular intervals for behavioral modifications.

The day Dr. Fisher carried out the animal test, he recorded all of the relevant data including identifying information regarding the project, the compound, the test, and so forth, his description of the protocol, and his observations, in his electronic laboratory notebook. The notebook system incorporates an automatic, reliable date-stamping feature and an audit capability. Dr. Fisher has been thoroughly trained by PharmCo in the use of its electronic notebook system, and he follows

318. Refer to notes 281-83 *supra* and accompanying text.

319. Refer to note 176 *supra*.

320. See, e.g., *Oka v. Youssefyeh*, 849 F.2d 581, 583 (Fed. Cir. 1988) (holding that conception of a chemical compound requires: (1) the idea of the structure of the compound; and (2) possession of an operative method of making it).

PharmCo's record-keeping procedures. The entry in question reads as follows:

PHARMCO INC. RESEARCH RECORDS	10/14/94
Researcher Name:	Richard D. Fisher
Researcher I.D.:	51560
Department:	Pharmacology
Project:	HappyDaze
Therapeutic Group:	CNS
Test Name:	Behavior Screen (Rats)
Test I.D. No.:	297
Compound Name:	Nocaradol
Compound I.D. No.:	NP/RDF-9118
<p>12 hyper-agitated rats were dosed (i.v.) with 50 mg. Nocaradol. Subjects observed at 5 min., 15 min., and 1 hr.</p> <p>Rats were initially (before dosing) extremely agitated, exhibiting aggressive tendencies.</p> <p>At five minutes, I observed gradual reduction in aggression, with no observable hostile behavior in any of the subjects after 15 minutes. I then observed the previously hostile rats engage in friendly behaviors, such as smiling and nuzzling each other.</p> <p>1 hour: No change.</p> <p>#Significant (Level 4) activity.</p>	

Again, the computer itself establishes that Dr. Fisher's notebook entry existed as of the date electronically "stamped" on the record. No further corroboration for that fact should be required.³²¹

The record recites Dr. Fisher's observations of significant pharmacological activity.³²² However, the computer cannot establish that Dr. Fisher actually carried out the test he described in the notebook as of the date of the record and, consequently, cannot corroborate a reduction to practice of the

321. See *Price v. Symsek*, 988 F.2d 1187, 1195 (Fed. Cir. 1993) (holding that documentary evidence of conception, shown to exist as of a certain date, establishes the conception as of that date).

322. The record may also give rise to questions concerning whether Dr. Fisher spends too much time with his rats.

invention as of that date.³²³ Consistent with the policy underlying the corroboration requirement,³²⁴ the potential for fabrication or falsification of records is regarded as too great to treat the existence of records as evidence that events actually occurred. The use of electronic research record-keeping systems does not alter the potential for abuse in this regard.

In the preceding example, Dr. Fisher's electronic notebook was merely used to record his experimental protocol and observations. What if, as is often the case with today's sophisticated technology, the computer actually participates in the reduction to practice?³²⁵ For example, suppose that, based on the results described above, Dr. Fisher conducted an additional test involving an investigation into Nocaratol's effect on rat blood levels of hostilitin, a hormone present in high levels in the bloodstreams of individuals exhibiting aggressive behavior. In accordance with standard industry procedures for evaluating potential central nervous system agents, Dr. Fisher typically subjects compounds that have demonstrated activity in the rat behavior test to this quantitative blood-level test. The test involves measuring hostilitin blood levels in agitated rats, such as those used above in the behavior screen, followed by injecting the rats with Nocaratol, and subsequently measuring any change in blood hostilitin levels induced by the drug.

Suppose Dr. Fisher carried out the blood level screen involving Nocaratol about a week after the behavior experiment. The blood hostilitin levels were measured using computerized analytical equipment that is part of the electronic laboratory notebook system. The following notebook entry was

323. It should be noted that a notebook entry of a person (inventor or noninventor), who testifies to the truth of the statements contained therein and is available for cross-examination concerning the entry, is not hearsay under the Federal Rules of Evidence. *See* FED. R. EVID. 801 advisory committee's note. A record relied upon as evidence of conception is not hearsay in any event because it is not offered to prove the truth of the statements made in the record. For example, in the hypothetical described above, Dr. Fisher's initial notebook entry regarding Nocoffital derivatives and their potential for anti-psychotic activity would not be offered to prove that the compounds shown therein *are* anti-psychotic agents, but rather that as of a particular date, *Dr. Fisher proposed that the compounds would possess such a utility*. Nevertheless, because of the requirement for corroboration, the fact that such records are not hearsay does not significantly lessen the task facing the records' proponent. Whether records of inventive activity are admissible because they are not hearsay or because they qualify for admission pursuant to a hearsay exception, the corroboration requirement is the greater evidentiary challenge.

324. Refer to note 146 *supra*.

325. As noted previously, one of the principle advantages of electronic laboratory notebook systems is their ability to integrate data generation and analysis with record-keeping functions, thereby automating, when possible, the capture and storage of relevant data. Refer to note 20 *supra*.

automatically generated in the process:

PHARMCO INC.		10/23/94	
RESEARCH RECORDS			
Researcher Name:	Richard D. Fisher		
Researcher I.D.:	51560		
Department:	Pharmacology		
Project:	HappyDaze		
Therapeutic Group:	CNS		
Test Name:	Hostilitin Levels		
Test I.D. No.:	178		
Compound Name:	Nocaratol		
Compound I.D. No.:	NP/RDF-9118		
Sample	Initial	Final	Change
1	442	380	62
2	467	412	55
3	413	365	48
4	393	324	69
5	497	420	77
6	468	389	79
7	480	418	62
8	551	470	81
9	462	392	70
10	478	406	72
11	418	353	65
12	458	394	64
SAMPLE	RANGE:	RANGE:	AVERAGE
12	138	117	67

Assume further that the numerical average result of 67 demonstrates pharmacological activity that reasonably correlates to a practical utility³²⁶ for Nocaratol.³²⁷

326. When laboratory testing is relied upon to demonstrate pharmaceutical utility, there must be a reasonable correlation between the testing and the asserted practical use. See *Cross v. Iizuka*, 753 F.2d 1040, 1050-51 (Fed. Cir. 1985); *Rey-Bellet v. Engelhardt*, 493 F.2d 1380, 1384 (C.C.P.A. 1974) (holding that the *in vivo* testing carried out by the inventors could not "be regarded as having been an adequate predicator of antidepressant activity in human beings because at the time the test was run there was insufficient experience with it to show the necessary correlation between tetrabenazine antagonism in mice and antidepressant activity in man").

Dr. Fisher was solely responsible for the information in the first, qualitative test and, presumably, could have fabricated the information recorded. In contrast, beyond introducing the blood samples into the analytical instrument and entering the test identification information that appears at the top of the record,³²⁸ Dr. Fisher did not participate in the creation of the notebook record for the second, quantitative Nocaritol test. Additional corroboration for the quantitative test results, which themselves demonstrate utility, should not be required. Nevertheless, the computer cannot corroborate a reduction to practice based even on the second, quantitative test because reduction to practice is not complete until the inventor, or someone working on his behalf, appreciates that the test was successful.³²⁹ Thus, until Dr. Fisher, or someone under his direction, reviews the instrument-generated test results and understands that the results correlate to a utility for Nocaritol, reduction to practice does not occur, and PharmCo cannot establish a date of invention based on the test.³³⁰ Because of the requirement for appreciation of success, an electronic notebook system offers no corroboration advantage over paper records for proof of reduction to practice.

VI. CONCLUSION

Independent evidence corroborating the inventor's proof regarding inventive activity continues to be required. However, application of the corroboration requirement, under the rule of reason, is not formulaic—the evidence as a whole must be considered.

Evidence in electronic form, such as an entry in an electronic laboratory notebook, is admissible pursuant to established evidentiary principles and can provide or contribute to the "cohesive web" of corroborative evidence necessary to prove dates of invention. The inclusion of reliable signature, dating, witnessing, and content verification features should imbue electronic records with the level of credibility traditionally enjoyed by paper laboratory notebooks. In fact, electronic laboratory notebook systems have the potential to enhance researchers' ability to document and prove inventive activity.

327. In other words, this test, if adequately corroborated, would constitute a reduction to practice of the invention. Refer to note 116 *supra*.

328. PharmCo would need to corroborate Dr. Fisher's testimony regarding the steps leading up to the instrumental analysis, including his testimony that the Nocaritol blood samples gave rise to the computer-generated notebook entry.

329. Refer to note 116 *supra*.

330. Refer to note 116 *supra*.