

**THE “PRINTED PUBLICATION” BAR AFTER
KLOPFENSTEIN: HAS THE FEDERAL CIRCUIT CHANGED
THE WAY PROFESSORS SHOULD TALK ABOUT
SCIENCE?**

Sean B. Seymore^{*}

I. INTRODUCTION

Lurking around every patent is the would-be infringer, who waits for the right moment to pounce.¹ The infringer often targets university-owned patents as his prey because faculty inventors are ill-trained in the patent laws,² particularly the statutory loss-of-right provisions.³ The

^{*} J.D., Notre Dame Law School, 2006; Ph.D., University of Notre Dame, 2001; M.S.Chem., Georgia Institute of Technology, 1996; B.S., University of Tennessee, 1993. Current address: Foley Hoag LLP, Seaport World Trade Center West, 155 Seaport Blvd., Boston, MA 02210. E-mail: seymore@alumni.nd.edu.

1. An infringer, however, runs the risk of having to pay treble damages and attorney’s fees if the court finds his conduct willful. See 35 U.S.C. § 284 (2000) (permitting treble damages); *id.* § 285 (permitting reasonable attorney’s fees to prevailing party); *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 377 U.S. 476, 508 (1964) (explaining the deterrent effect of statutory provisions). So when “‘a potential infringer has actual notice of another’s [presumptively valid] patent rights, he has an affirmative duty to exercise due care to determine whether or not he is infringing,’ including ‘the duty to seek and obtain competent legal advice from counsel before the initiation of any possible infringing activity.’” *Knorr-Bremse Systeme Fuer Nutzfahrzeuge GmbH v. Dana Corp.*, 383 F.3d 1337, 1343 (Fed. Cir. 2004) (quoting *Underwater Devices, Inc. v. Morrison-Knudsen Co.*, 717 F.2d 1380, 1389-90 (Fed. Cir. 1983) (explaining the doctrine of willful infringement)).

2. See Sean B. Seymore, *My Patent, Your Patent, or Our Patent? Inventorship Disputes within Academic Research Groups*, 16 ALB. L.J. SCI. & TECH. 125, 166 (2006) (“[T]he university cannot rely on professors to make proper [patent-related] decisions . . . [because] professors rarely understand and appreciate patent law. . . .”); Sean B. Seymore, *How Does My Work Become Our Work? Dilution of Authorship in Scientific Papers, and the Need for the Academy to Obey Copyright Law*, 12 RICH. J.L. & TECH. 11, ¶ 39 (2006), available at <http://law.richmond.edu/jolt/v12i3/article11.pdf> (“[U]niversities need to train science faculty and graduate students in intellectual property fundamentals.”).

3. An inventor cannot receive a patent if the invention was “described in a printed publication in this or a foreign country . . . more than one year prior to the date of the application for patent in the United States.” 35 U.S.C. § 102(b). This loss-of-right provision, the “statutory bar,” prevents an inventor from obtaining a patent if he delays in filing, even if the product was new and

would-be infringer has in his arsenal the “printed publication” bar of 35 U.S.C. § 102(b).⁴ If the infringer can prove that, before the critical date,⁵ the professor disclosed the invention to a group of interested persons using a reference⁶ that falls under the broad ambit of a “printed publication,”⁷ the professor either jeopardizes his own right to a patent⁸ or compromises the value of an existing patent.⁹ The § 102(b) printed publication bar terrifies university technology transfer offices¹⁰ (TTOs)

patentable when it was invented:

[The loss-of-right provisions,] [s]ections 102(b), 102(c) and 102(d)[,] all relate to events and acts by the inventor or by other persons prior to the date when the inventor applies for a patent. The point of a statutory bar is that an inventor of a product or process that may have been new and patentable at the time of invention can lose the right to obtain a patent by tardiness in applying for a patent.

1 DONALD S. CHISUM, CHISUM ON PATENTS § 3.01 (2006).

“A person who invents a product . . . that meets the conditions of patentability (statutory subject matter, novelty, utility, nonobviousness) is under no categorical duty to file an application for the patent within any certain period of time;” but once an inventor’s action triggers a § 102(b) event, he “must apply for a patent within the prescribed period or be forever barred from obtaining a patent.” 2 CHISUM *supra*, § 6.02 (explaining the § 102(b) statutory bar).

4. For the statutory text, see *supra* note 3.

5. The critical date “[is] defined as one year prior to the U.S. filing date to which the application was entitled.” *Pfaff v. Wells Elecs., Inc.*, 124 F.3d 1429, 1433 (Fed. Cir. 1997), *aff’d*, 525 U.S. 55 (1998). Therefore, Congress “has not made the existence of a ‘printed publication’ a bar to the grant of a patent under all circumstances. Congress has given applicants a period of grace of one year after the invention has been described in a printed publication for the applicant to file his application.” *In re Tenney*, 254 F.2d 619, 624 n.5 (C.C.P.A. 1958).

6. Professor Donald Chisum defines a “prior art” reference as follows:

The prior art constitutes those references which may be used to determine the novelty and nonobviousness of claimed subject matter in a patent application or patent. It includes both documentary sources (patents and publications from anywhere in the world) and nondocumentary sources (things known, used or invented in the United States). A reference must be in the art pertinent to the invention in question or in an analogous art. A reference must be dated prior to the applicant’s date of invention or, in the case of statutory bars, more than one year prior to his date of application for a patent.

1 CHISUM *supra* note 3, Glossary, G1-18.

7. See *infra* Parts III, IV.

8. In the United States, “[w]hoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.” 35 U.S.C. § 101.

9. The accused or would-be infringer will always determine the existence of any statutory bars at an early stage in litigation because, “in terms of securing and organizing evidence, [the inquiry involves] a single and basic factual determination.” 2 HORWITZ & HORWITZ, PATENT LITIGATION: PROCEDURE & TACTICS § 6.03 (2006). Therefore, § 102(b) statutory bars are also a common ground for summary judgment. See *id.* § 6.05[5][c] (“Proof of an act by the patentee resulting in the loss of his right to patent is the most promising situation for summary judgment because the required showing probably will not be technical in nature.”).

10. “University technology transfer is the process by which a university commercializes inventions and innovations developed by university faculty and researchers. Technology transfer takes many forms, from patent licensing to forming start-up ventures on campus.” Mark L. Gordon, *University Controlled or Owned Technology: The State of Commercialization and*

because, in academic research, patentability and validity “can be derailed by the kind of disclosure that is a normal part of routine scientific discourse.”¹¹

In *In re Klopfenstein*,¹² the Federal Circuit held that a fourteen-slide lecture, which was ultimately displayed as a poster, was sufficient to trigger the “printed publication” bar, even though hard copies of the presentation were neither disseminated nor indexed in a library.¹³ *Klopfenstein* is particularly important in the realm of academic science because it suggests that under certain circumstances a run-of-the-mill research talk can become a § 102(b) “printed publication” and trigger the one-year clock.¹⁴

Some commentators view *Klopfenstein* as a departure from prior precedent,¹⁵ particularly the college thesis cases,¹⁶ which suggested that dissemination or library indexing of at least one copy was required to trigger the § 102(b) clock.¹⁷ In this Article, I argue that *Klopfenstein* is consistent with prior § 102(b) case law. The Federal Circuit has always recognized that “prior public disclosure of the substance of an invention serves as the most fundamental bar to the ability of an inventor to obtain patent protection.”¹⁸ Thus, *Klopfenstein* shows that the Federal Circuit, like its predecessor court,¹⁹ focuses the printed publication inquiry on whether the presentation is sufficiently accessible to the interested

Recommendations, 30 J.C. & U.L. 641, 641 (2004).

11. Jeff Rothenberg, *A Scientific Presentation Can Defeat Patentability*, THE BUSINESS REV., Dec. 2, 2005, available at <http://www.bizjournals.com/albany/stories/2005/12/05/smallb3.html?page=2>.

12. 380 F.3d 1345 (Fed. Cir. 2004).

13. *Id.* at 1352. See *infra* Part III.B.2.

14. See *infra* Part IV.

15. See, e.g., Margo A. Bagley, *Academic Disclosure and Proprietary Rights: Putting Patents in Their Proper Place*, 47 B.C. L. REV. 217, 221 (2006) (“The decision is significant because previous caselaw had required the distribution of at least some copies or the indexing and cataloguing of at least one physical copy of a reference before such information would be considered patent-defeating prior art.”); Cindy Ricks, Note, *The “Printed Publication” Bar As Applied to Presentations Made at Scientific Conferences*, 83 WASH. U. L.Q. 843, 861 (2005) (“The court’s decision in *Klopfenstein* appears to be a departure, or at least a change in direction, from previous case law regarding the printed publication bar of section 102(b).”).

16. See *infra* Part III.B.2.

17. See *infra* Part III.B.2.

18. Advisory Commission on Patent Law Reform, U.S. Dep’t of Commerce, Report to the Secretary of Commerce 47 (1992).

19. The U.S. Court of Customs and Patent Appeals (“C.C.P.A.”) ceased to exist on September 30, 1982. The successor court, the U.S. Court of Appeals for the Federal Circuit (“Federal Circuit”), adopted the C.C.P.A. decisional law as binding precedent. *South Corp. v. United States*, 690 F.2d 1368, 1370 (Fed. Cir. 1982) (en banc) (“As a foundation for decision in this and subsequent cases in this court, we deem it fitting, necessary, and proper to adopt [the holdings of the C.C.P.A.] as precedent.”).

public.²⁰ The key question for universities is how *Klopfenstein* will affect the way that science professors talk about science.

To answer this question, Part II explores the conflict between a professor's need to disseminate research and the university's potential interest in seeking patent protection. The research talk, one of the most important forums for communication in the science community, is an objective measure of research success and scholarship. When a professor produces a patentable invention, university TTOs must balance the professor's need to discuss the research against the strict statutory requirement to file within one year of public disclosure.²¹ If a professor inadvertently triggers the § 102(b) clock, the university may lose patent protection.²²

Part III describes the policy and statutory basis for the § 102(b) printed publication bar as interpreted by the Federal Circuit and its predecessor court.²³ Contrary to other commentators, this Article suggests that the court's jurisprudence has remained constant. Admittedly, however, the Federal Circuit has held that the inventor can trigger the printed publication bar *without* disseminating physical copies, but the focus of the inquiry remains the same: sufficient accessibility to the interested public.²⁴

In Part IV, this Article applies the four factors articulated by the *Klopfenstein* court²⁵ which aid in the § 102(b) printed publication inquiry to academic research talks. Although the Federal Circuit has

20. Compare *In re Wyer*, 655 F.2d 221, 226 (C.C.P.A. 1981) (“[W]e are convinced that the contents of the application were sufficiently accessible to the public and to persons skilled in the pertinent art to qualify as a ‘printed publication.’”) with *In re Cronyn*, 890 F.2d 1158, 1160 (Fed. Cir. 1989) (“The statutory phrase ‘printed publication’ has been interpreted to mean that before the critical date the reference must have been sufficiently accessible to the public interested in the art . . .”) and *In re Klopfenstein*, 380 F.3d 1345, 1350 (Fed. Cir. 2004) (“[W]e must consider several factors relevant to the facts of this case before determining whether or not [the reference] was sufficiently publicly accessible in order to be considered a ‘printed publication’ under § 102(b).”).

21. See *supra* note 3 and accompanying text.

22. See *supra* note 3 and accompanying text.

23. See *supra* note 19 and accompanying text.

24. See *In re Klopfenstein*, 380 F.3d 1345 (Fed. Cir. 2004). According to the court, a given reference is “publicly accessible” if

[U]pon a satisfactory showing that such document has been disseminated or otherwise made available to the extent that persons interested and ordinarily skilled in the subject matter or art exercising reasonable diligence, can locate it and recognize and comprehend therefrom the essentials of the claimed invention without need of further research or experimentation.

Bruckelmyer v. Ground Heaters, Inc., 445 F.3d 1374, 1378 (Fed. Cir. 2006) (quoting *I.C.E. Corp. v. Armco Steel Corp.*, 250 F.Supp. 738, 743 (S.D.N.Y. 1966)).

25. *Klopfenstein*, 380 F.3d at 1350.

suggested that a lecture that includes a transient display of visual aids is less likely to be considered a “printed publication” for § 102(b) purposes than lengthier displays,²⁶ this Part concludes that the run-of-the-mill research talk, which relies heavily on visual aids, cannot survive a *Klopfenstein* analysis.

Part V explores how professors, with proper planning, can discuss their research without destroying patentability. First, an inventor can timely file a provisional patent application, which will nullify § 102(b) if done properly. An inadequate or untimely filing, however, can create a trap for the unwary that may bar patentability. Second, universities can create an environment that gives faculty a reason to care about patentability issues. For example, universities should give professors a stake in the outcome, financial or otherwise, by encouraging and rewarding faculty entrepreneurialism. Therefore I assert that § 102(b) issues that arise in the academic context are best handled through managerial decision making; not through changing the patent laws.

II. RESEARCH TALKS, TECHNOLOGY TRANSFER, AND THE CONFLICT

A. *The Scientific Talk: A Piece of the Publish or Perish Puzzle*

The scientific research talk “has become one of the most important communication forums for the scientific community.”²⁷ An invitation to speak, like journal publications and external funding, is another indicator of a professor’s success in research.²⁸ Giving a talk at a research conference, university, corporation, or national laboratory is an objective measure of career advancement that may serve as an element in the promotion and tenure calculus.²⁹ Indeed, a young professor *must* leave

26. *Id.*

27. Mark Schoeberl & Brian Toon, Ten Secrets to Giving a Good Scientific Talk, http://www.cgd.ucar.edu/cms/agu/scientific_talk.html (last visited March 22, 2007).

28. Graeme Eisenhofer, *Scientific Productivity: Waning Importance for Career Development of Today’s Scientist?*, (Sept. 9, 1996) <http://his.com/graeme/pandp.html> (“It is essential that . . . the young scientist . . . appreciate the importance of this form of interpersonal communication for career advancement.”).

29. Universities tend to list the criteria for promotion and tenure explicitly in faculty handbooks. For example:

The performance of a faculty member in research is evaluated both qualitatively and quantitatively (e.g., numbers, impact factor, citations, etc.) based on . . . refereed articles published in recognized technical journals . . . ; competitive research grants from external organizations of national stature . . . ; patents awarded . . . ; presentations made at international, national or regional technical meetings and invited seminars (universities, industry, and government laboratories) . . .

the laboratory and ride the seminar circuit in order “to facilitate communication of results and initiate contact with other scientists.”³⁰ The success of academic scientists, therefore, “often depends on how quickly and how often they present their inventions to the rest of the scientific community.”³¹

Although the audience is most concerned with the substance of the talk, visual aids are essential.³² Without a doubt, the speaker must disclose his results with enough evidentiary support to convince a highly skeptical audience³³ that his research results are true and capable of repetition.³⁴ Earning the respect of one’s peers weighs heavily in the “publish or perish” calculus.³⁵

Criteria and Procedures on Faculty Evaluation for Tenure & Promotion, http://www.ksu.edu/academic/services/add/eng/chem/echm_promo_04_2003.pdf (last visited April 25, 2003). See also Promotion & Tenure Policies & Procedures of the Department of Biological Sciences at Mississippi State University, http://www.msstate.edu/dept/academic_affairs/BioSciP&Tdocument.pdf (last visited Sept. 16, 2005) (“The research activities of an individual being considered for promotion to Professor should be represented by an established research program with demonstrated continuous productivity and recognition of this program on a national and international level. Such recognition could include . . . invited seminars at research universities . . .”).

30. Eisenhofer, *supra* note 28.

31. Noera Ayaz, *Is a Scientific Presentation Disclosing A Later-Claimed Invention an Invalidating “Printed Publication” Under 35 U.S.C. Section 102(b)?* Oct. 18, 2004, <http://www.bakerbotts.com/infocenter/publications>.

32. The form and content of research seminars varies among professors. Whereas some science professors still use overhead transparencies, slides, or chalk, others use graphical presentation software. See generally CLIFF I. DAVIDSON & SUSAN A. AMBROSE, *THE NEW PROFESSOR’S HANDBOOK: A GUIDE TO TEACHING & RESEARCH IN ENGINEERING AND SCIENCE* 159-70 (describing how a new professor should present a talk on research results).

33. Many scientists adopt Sturgeon’s law that ninety-five percent of biomedical science, including research, is “crap.” Peter J. McDonnell M.D., *Are You Skeptical of the Latest Peer-Reviewed Results?* OPTHALMOLOGY TIMES, Feb. 15, 2006, at 4, available at <http://www.opthalmologytimes.com/opthalmologytimes/article/articleDetail.jsp?id=306>.

34. See, e.g., Robert Speth, *Bad Science, Fraud, and Peer Review*, CHEMISTRY & INDUSTRY, Jan. 23, 2006, at 15 (attributing sloppy science and scientific fraud to lapses in the peer review process).

There is increasing concern that most current published research findings are false. The probability that a research claim is true may depend on study power and bias, the number of other studies on the same question, and, importantly, the ratio of true to no relationships among the relationships probed in each scientific field.

John P. A. Ioannidis, *Why Most Published Research Findings Are False*, PLOS MEDICINE, August 2005, at e124, available at <http://medicine.plosjournals.org/perlserv/?request=get-document&doi=10.1371/journal.pmed.0020124>. In many scientific fields, “claimed research findings may often be simply accurate measures of the prevailing bias.” *Id.*

35. “Of course, the would be up and coming scientist must have the necessary oral communication skills and some good material to present to warrant an invited presentation. Here again is the importance of scientific productivity and the need to link this to opportunities of exposure and promotion at meetings, symposia, and lecture series.” Eisenhofer, *supra* note 28.

B. Faculty-Generated Inventions: The Key to Technology Transfer

Research universities have created technology transfer offices (TTOs) which strive to "transfer" faculty-generated inventions from the laboratory to the world of commerce.³⁶ In light of the ever-increasing costs of conducting research and the uncertainty of federal funding, these collaborations allow universities to generate revenue through patent licensing.³⁷ Nevertheless, in fact, licenses generate only a relatively small percentage of a university's income.³⁸ Universities derive "second-order" benefits from technology transfer, which include

36. The Patent and Trademark Act Amendments Act of 1980, commonly known as the Bayh-Dole Act, sparked the growth of university technology transfer, by allowing universities and other non-profit organizations to retain title to inventions which emerge from federally-sponsored research. See Pub. L. No. 96-517 § 6, 94 Stat. 3019 (1980) (codified as amended at 35 U.S.C. §§ 200-212 (2006)). Through this legislation, Congress sought "to promote the utilization of inventions arising from federally supported research[.]" "to encourage maximum participation of small business firms in federally supported research[.]" "to promote collaboration between commercial concerns and nonprofit organizations, including universities." *Id.* at § 200. Professor Mireles explains the integral role of technology transfer at the modern research university as follows:

Most, if not all, universities have developed policies directed toward research and development collaborations between private industry and the university. Those policies attempt to strike a balance between the desire to use university research to bring products to market, create revenue streams for the university, which generate additional funding for university research, and maintain the ability of university researchers to pursue basic research. The policies also state the university's stance toward university-private industry licensing and define the rights and duties of the inventor, the university, and the outside entity. In addition to a policy, most universities will establish administrative procedures for evaluating prospective patented inventions, obtaining and securing patents and other intellectual property rights, and transferring rights to entities outside the university.

Michael S. Mireles, *An Examination of Patents, Licensing, Research Tools, and the Tragedy of the Anticommons in Biotechnology Innovation*, 38 U. MICH. J.L. REFORM 141, 161 (2004) (footnotes omitted).

37. See Kenneth Sutherlin Dueker, *Biobusiness on Campus: Commercialization of University-Developed Biomedical Technologies*, 52 FOOD & DRUG L.J. 453, 453-56 (1997) (providing a detailed history and economic analysis on technology transfer at universities).

38. *Id.* at 453 ("Most people who are even reasonably optimistic think it's highly unlikely that very many institutions will ever realize more than five percent of their research budget from this source.") *Id.* (citing *Universities Across U.S. Invent a Way to Bring in More Money, Cashing in on Research*, Omaha World-Herald, May 30, 1995, at 2); Peter D. Blumberg, Comment, *From "Publish or Perish" to "Profit or Perish": Revenues From University Technology Transfer and the § 501(c)(3) Tax Exemption*, 145 U. PA. L. REV. 89, 97 (1996) ("An oft-quoted rule of thumb suggests that of ten laboratory inventions, only one will receive a patent; only one in ten patents will be licensed by a company, and only one in ten licenses results in more than \$25,000 per year in income.") (citation omitted); Joshua B. Powers, *Between Lab Bench and Marketplace: the Pitfalls of Technology Transfer*, THE CHRONICLE OF HIGHER ED., May 22, 2006, at B18 ("[Research] shows that after subtracting their operating costs — i.e., expenditures for patenting, staffing, and overhead — more than half of universities consistently lose money on technology transfer.").

fulfilling a professor's desire to see tangible results of his research, allowing professors to engage in applied rather than basic research, creating university-owned startups, and fulfilling the university's mission to disseminate knowledge for the public good.³⁹

Additionally, technology transfer alters the relationship between academic research and commerce, which changes faculty behavior and the culture of academic research.⁴⁰ For example, a professor "who may previously have looked to coauthorship or journal citation, now seeks [listing on a patent] as coinventor or seeks receipt of a portion of the licensing agreement revenues."⁴¹ Indeed, commercial interest in a professor's invention is a strong indicator of creative scholarship,⁴² which is "proven" if the invention is ultimately licensed.⁴³ Therefore, patent licensing raises many questions about academic freedom, research

39. See Dueker, *supra* note 37, at 468-69 (describing the "second-order" benefits of technology transfer).

40. See generally Sara Boettiger & Alan Bennett, *The Bayh-Dole Act: Implications for Developing Countries*, 46 IDEA 261, 266-67 (2006) (discussing the effect of increased patenting and commercialization on U.S. universities' research agenda); Harvey Brooks, *Current Criticisms of Research Universities*, in THE RESEARCH UNIVERSITY IN A TIME OF DISCONTENT 231, 247 (Jonathan R. Cole et. al. eds., 1994) ("[Some critics suggest that] universities have already moved much too far toward adopting the culture of the marketplace and . . . fear that business interests and values and rent-seeking behavior are undermining the distinctive academic culture and its potential contribution to national well-being . . .").

41. Natasha N. Aljalian, *The Role of Patent Scope in Biopharmaceutical Patents*, 11 B.U. J. SCL. & TECH. L. 1, 43 n.167 (2005) (citation omitted).

42. See, e.g., Boston Univ. College of Engineering, Faculty Expectations § 2.6 (May 2001), available at <http://www.bu.edu/eng/facforms/FACULTY%20EXPECTATIONS%20Final.pdf> (May 2001) ("Technology transfer, i.e. the moving of ideas from the laboratory to the world of commerce in a useful form, is an important part of knowledge dissemination and is therefore another indication of success in research.").

43. Some universities consider patents in promotion and tenure evaluations:

[A]ll faculty . . . are expected to engage in scholarly endeavors and produce works to be judged by their peers, both inside and outside the University. Peer reviews may take several forms, but acceptance of work should provide evidence of some wider recognition of the work's value. Acceptance of a manuscript by the editor of a refereed professional journal certainly satisfies these conditions, *but so does issuance of a patent or other protection of intellectual property* [Emphasis added.]

New Mexico State University, Guidelines for Promotion and Tenure of Academic Programs and AES Faculty (Oct. 29, 1996), http://www.cahe.nmsu.edu/employee/internal_docs/AESpt.html. See also Stevens Institute of Technology; The Faculty P&T Committee White Paper on Promotion, Tenure, and Mentoring § 5.6 (Dec. 12, 2005), <http://www.stevens-tech.edu/main/home/faculty> ("Candidates who bring forward creative inventions or are granted significant patents . . . need to be recognized. Such accomplishments may count as evidence of scholarly activity. . . . It should be possible, therefore, for the exceptional candidate to be recommended for tenure and/or promotion substantially on the basis of his or her contributions as an inventor."). But see New Mexico State University, *supra*, "[P]ublication in refereed scholarly journals precedes other evidence of professional stature."

priorities, incentives, and the need to preserve "open science."⁴⁴

Universities promulgate patent policies that attempt to prevent inadvertent § 102(b)-triggering events.⁴⁵ The risk of the statutory bar "helps explain the precautions and gyrations that universities and inventors must go through, and that are, in certain cases, the cause of potential conflicts between academic researchers and commercial sponsors and licensees."⁴⁶

C. *The Conflict*

Universities must balance the need to allow science professors to disseminate their research with the need to protect the institution's interest in patent licensing. This balancing demonstrates the tension between patent protection and the dissemination of information:

Scientific researchers and academics are often under a great deal of pressure to publish or present their findings soon after making their discoveries. Indeed, scientists' success often depends on how quickly and how often they present their inventions to the rest of the scientific community. These strong incentives to promulgate their findings at an

44. Arti K. Rai & Rebecca S. Eisenberg, *Bayh-Dole Reform and the Progress of Biomedicine*, 66 *LAW & CONTEMP. PROBS.* 289, 305 (2003) (describing the prominent role of TTOs in university decision-making). Commercialization and licensing decisions often are made by technology transfer officers who are not themselves academics. *Id.* TTOs "see their primary job as bringing licensing revenue into the university. Their ability to bring in license revenue may also be an important criterion by which their performance is assessed. Adherence to norms of open science is at odds with this primary mission and tempts technology transfer professionals to depart from the form whenever they think a particular material may have commercial value." *Id.* at 306 (footnote omitted).

45. For example, Georgetown University prints its patent policy in the faculty handbook: The University Inventor is subject to many pressures in the academic community to publish materials describing research. Premature publication may, however, adversely affect the public use and benefits of scientific data. Ideas promulgated in the literature without adequate prior protection may ultimately be lost to the public good due to their limited commercial potential. It is important for the University Inventor to be aware of the potential harm of premature publication, which severely undermines the patentability of an invention. Because of the great costs associated with bringing a product to market, companies are usually willing to develop technology only if it is protected by patents.

.....

In general, a patent owner in the United States has a grace period of one year to file an application after disclosure through publication or public presentation of the nature of the invention. If the U.S. patent application is filed prior to any publication or presentation, worldwide patent rights are preserved for one year from the U.S. filing date.

Georgetown University Faculty Handbook, § XIII.c (1999), available at <http://www.georgetown.edu/facultysenate/handbook.html>.

46. Dueker, *supra* note 37, at 472 (discussing the § 102(b) printed publication bar).

early date may cause problems for inventors under U.S. and foreign patent law when they seek patent protection for the fruits of their earlier-disclosed findings.⁴⁷

The actual fight is over timing;⁴⁸ however, “an understanding has developed between universities and industry (and between TTOs and faculty) that publication will be delayed only for the minimum amount of time necessary to secure intellectual property protection.”⁴⁹

While a reasonably astute science professor recognizes that disclosure in a journal publication or at a research conference may adversely affect patentability, a professor may not know that, in light of *Klopfenstein*, an informal, run-of-the-mill research talk can also trigger the § 102(b) printed publication bar.⁵⁰

III. THE “PRINTED PUBLICATION” BAR

The Patent Act⁵¹ contains a loss-of-right provision, 35 U.S.C. § 102(b), which precludes patentability for the inventor’s own conduct.⁵² An inventor cannot receive a patent if the invention was “described in a printed publication in this or a foreign country . . . more than one year prior to the date of the application for patent in the United States”⁵³ Therefore, a delay in filing the patent application leads to a “statutory bar.”⁵⁴

47. *Ayaz*, *supra* note 31.

48. *Dueker*, *supra* note 37, at 473.

[T]he one-year grace period [available in the U.S.] is not available in many foreign countries. Thus, any prefiling publication . . . may result in the loss of foreign rights. These considerations have lead [sic] both industrial sponsors and university TTOs to attempt to delay publication to allow for patent filings.

Id.

49. *Id.* “[A]lthough a good deal of attention is given to this issue, publication delay provisions are rarely sticking points in contract negotiations. They present problems only with unsophisticated sponsors who are not familiar with university contract practices.” *Id.* (citation omitted).

50. *See infra* Part IV.

51. *See* 35 U.S.C. §§ 1-376 (2000).

52. *Id.* § 102(b).

53. *Id.*

54. Patent practitioners are always mindful of the so-called “statutory bar.”

Disclosure to the public of one’s own work constitutes a bar to the grant of a patent claiming the subject matter so disclosed . . . only when the disclosure occurred more than one year prior to the date of the application, that is, when the disclosure creates a one-year time bar, frequently termed a “statutory bar,” to the application under § 102(b).

In re Katz, 687 F.2d 450, 454 (C.C.P.A. 1982).

A. Policy Considerations

The printed publication bar⁵⁵ operates to deny the benefit of patent protection to an inventor who has already made his invention accessible to the public by his own conduct.⁵⁶ The Supreme Court views the patent system as “a carefully crafted bargain that encourages both the creation and the public disclosure of new and useful advances in technology, in return for an exclusive monopoly for a limited period of time.”⁵⁷ Professor Durham explains the threefold rationale for § 102(b) and how the statute strikes a balance between the needs of the inventor and the public as follows:

First, and most generally, [§ 102(b)] encourages diligence by penalizing inventors who are lazy . . . or who for some other reason delay in filing a patent application. Second, it prevents the public from being misled where the availability of the invention to the public, without evidence that the inventor intends to obtain a patent, might create the impression that the invention is up for grabs. [Third], it prevents what could be an unwarranted extension of the inventor’s monopoly powers . . . [which] could prevent potential competitors from daring to compete. On the other hand, an inventor does need a certain amount of time to . . . judge whether [the invention] is worth pursuing, and prepare a patent application. . . . [The one-year grace period] effectively balances the needs of the inventor against the needs of the public.⁵⁸

Section 102(b) “serves as a limiting provision, both excluding ideas that are in the public domain from patent protection and confining the

55. “The ‘printed publication’ bar appears to have been first enacted in § 7 (on examination) of the Patent Act of 1836, 5 Stat. 117, July 4, 1836. Section 6 of the Act of 1793, 1 Stat. 318, listing defenses, used the expression ‘described in some public work anterior to the supposed discovery of the patentee.’” *In re Wyer*, 655 F.2d 221, 226 n.3 (C.C.P.A. 1981).

56. See *LaBounty Mfg., Inc. v. U.S. Int’l Trade Comm’n*, 958 F.2d 1066, 1071 (Fed. Cir. 1992) (“The general purpose behind section 102(b) bars is to require inventors to assert with due diligence their right to a patent through the prompt filing of a patent application.”). Section 102(b) “establishes a one year grace period based on publication or public use or sale, after which an inventor is barred from access to the patent system.” *Woodland Trust v. Flowertree Nursery, Inc.*, 148 F.3d 1368, 1370 (Fed. Cir. 1998). But section 102(b), “unlike § 102(a), is primarily concerned with the policy that encourages an inventor to enter the patent system promptly, while recognizing a one year period of public knowledge or use . . . before the patent application must be filed.” *Id.* at 1370.

57. *Pfaff v. Wells Elec., Inc.*, 525 U.S. 55, 63 (1998).

58. ALAN L. DURHAM, *PATENT LAW ESSENTIALS: A CONCISE GUIDE* 117-18 (2004) (citing *LaBounty*, 958 F.2d at 1071) (discussing the general purpose and policies behind the § 102(b) bars); *Continental Plastic Containers v. Owens Brockway Plastic Prods., Inc.*, 141 F.3d 1073, 1079 (Fed. Cir. 1998) (same); and *Baxter Int’l, Inc. v. Cobe Labs., Inc.*, 88 F.3d 1054, 1058 (Fed. Cir. 1996) (same).

duration of the monopoly to the statutory term.”⁵⁹ To allow the inventor to withdraw, as the subject matter of a patent, that which is already in possession of the public would frustrate the patent laws.⁶⁰ As consideration for the patent grant, “something must be given to the public which it did not have before[,]”⁶¹ but if the public already possesses that “something,” or if it is already publicly accessible, there is a failure of consideration.⁶² When the lack of consideration occurs before issuance, the patent application will be rejected; when afterward, the patent is subject to invalidation.⁶³

B. Statutory Construction

1. Overview

“The statutory phrase ‘printed publication’ has been interpreted to mean that before the critical date⁶⁴ the reference must have been sufficiently accessible to the public interested in the art; dissemination and public accessibility are the keys to the legal determination whether a prior art reference was ‘published.’”⁶⁵ The proponent of the printed

59. *Pfaff*, 525 U.S. at 64.

60. See *Bonito Boats Inc. v. Thunder Craft Boats Inc.*, 489 U.S. 141, 148 (1989) (“Sections 102(a) and (b) operate in tandem to exclude from consideration for patent protection knowledge that is already available to the public. They express a congressional determination that the creation of a monopoly in such information would not only serve no socially useful purpose, but would in fact injure the public by removing existing knowledge from public use.”); *In re Wyer*, 655 F.2d 221, 226 (C.C.P.A. 1981) (“As this court pointed out in *In re Bayer*, [568 F.2d 1357, 1359 (C.C.P.A. 1978)], the printed publication provision was designed to prevent withdrawal by an inventor, as the subject matter of a patent, of that which was already in the possession of the public.”). In 1958, the C.C.P.A. provided an expansive discussion of the policy underlying the printed publication bar:

An inventor does not become entitled to a patent merely by exercising his creative faculties in the production of an art or instrument. The consideration for the grant of his exclusive privilege is the benefit which he confers upon the public by placing in their hands a means through the use of which their wants may be supplied.

In re Tenney, 254 F.2d 619, 623 (C.C.P.A. 1958) (quoting 1 WILLIAM C. ROBINSON, *THE LAW OF PATENTS FOR USEFUL INVENTIONS*, at 305 (1890)). So “unless the public so derives benefit, [and] unless the patentee, by his disclosure, adds to the sum of human knowledge, the grant of a patent would, in fact, be a monopoly within the above definition, and the policy of the patent laws would be frustrated.” *Id.*

61. *Tenney*, 254 F.2d at 624.

62. *Id.*

63. *Id.* at 623. “If the same means has been already made accessible to [the public] by the inventive genius . . . no benefit results to them from his inventive act and there is no consideration for his patent. . . . In order, therefore, that an invention may be patented or protected by a patent, it must be new, that is, bestowed for the first time upon the public by the patentee.” *Id.*

64. See *supra* note 5 and accompanying text.

65. *In re Klopfenstein*, 380 F.3d 1345, 1348 (Fed. Cir. 2004) (quoting *Constant v. Advanced*

publication bar must prove by clear and convincing evidence⁶⁶ that prior to the critical date, a document "has been disseminated or otherwise made available to the extent that persons interested and of ordinary skill in the subject matter or art, exercising reasonable diligence can locate it and recognize and comprehend therefrom the essentials of the claimed invention without need of further research or experimentation."⁶⁷ Operation of the bar "is a legal determination based on underlying fact issues, and therefore must be approached on a case-by-case basis."⁶⁸ When "no facts are in dispute, the question of whether a reference represents a 'printed publication' is a question of law."⁶⁹

2. What Does "Dissemination" Mean?

The Federal Circuit does not interpret "dissemination" to *require* the distribution of physical copies, which is consistent with the court's construction of "printed publication" as a unitary concept.⁷⁰ The court

Micro-Devices, Inc., 848 F.2d 1560, 1568 (Fed. Cir. 1988), *cert. denied*, 488 U.S. 892 (1988)).

66. *See, e.g.*, Northern Telecom, Inc. v. Datapoint Corp., 908 F.2d 931, 936-37 (Fed. Cir. 1990) ("The district court, referring to the uncertainties of public access[,] . . . found that Datapoint had failed to prove by clear and convincing evidence facts requiring a conclusion that these documents were sufficient as prior publications . . . [because the court] was unable to find that anyone could have had access to the documents by the exercise of reasonable diligence. . . . [We affirm]."), *cert. denied*, 498 U.S. 520 (1990); Norian Corp. v. Stryker Corp., 252 F.Supp.2d 945, 954 (N.D.Cal. 2002) ("[The proponent] had to prove that the abstract qualified as a printed publication, including public accessibility, by clear and convincing evidence."), *rev'd on other grounds*, 363 F.3d 1321, 1330 (Fed. Cir. 2004) ("[T]he lack of substantial evidence of actual availability . . . adequately supports the court's conclusion that dissemination of the Abstract was not established."). A patent is presumed valid; thus, the challenger must come forward with clear and convincing evidence of invalidity. *See* 35 U.S.C. § 282 (2002).

67. *Mass. Inst. of Tech. v. AB Fortia*, 774 F.2d 1104, 1109 (Fed. Cir. 1985) (quoting *In re Wyer*, 655 F.2d 221, 226 (C.C.P.A. 1981)). *Cf. In re Hall*, 781 F.2d 897, 899 (Fed. Cir. 1986) ("The proponent of the publication bar must show that prior to the critical date the reference was sufficiently accessible, at least to the public interested in the art, so that such a one by examining the reference could make the claimed invention without further research or experimentation.").

68. *Hall*, 781 F.2d at 899 (citing *Wyer*, 655 F.2d at 227). *See also* *Norian Corp. v. Stryker Corp.*, 363 F.3d 1321, 1330 (Fed. Cir. 2004) ("Whether a document is a prior publication [for § 102(b) purposes] is a question of law."); *In re Cronyn*, 890 F.2d 1158, 1161 (Fed. Cir. 1989) ("The decision whether a particular reference is a printed publication 'must be approached on a case-by-case basis.'") (citing *Wyer*, 655 F.2d at 227).

69. *In re Klopfenstein*, 380 F.3d 1345, 1347 (Fed. Cir. 2004) (citing *Cronyn*, 890 F.2d at 1159). "Questions of law appealed from a Board [of Patent Appeals & Interferences] decision are reviewed de novo. . . . [When] there are no factual disputes between the parties . . . the legal issue of whether [a] reference is a 'printed publication' will be reviewed de novo." *Id.* at 1347-48.

70. The C.C.P.A. settled any dichotomy between "printed" and "publication" in 1981: "The traditional process of "printing" is no longer the only process synonymous with "publication." The emphasis, therefore, should be public dissemination of the document, and its availability and accessibility to persons skilled in the subject matter or art."

We agree that "printed publication" should be approached as a unitary concept. The

defines “dissemination” in its literal sense, which is more in line with the purpose of the statute.⁷¹ In *In re Wyer*, the C.C.P.A. determined that an Australian patent application on microfilm qualified as a printed publication even without proof of an actual viewing or dissemination of the reference.⁷² The key fact for § 102(b) purposes was that “the contents of the application were sufficiently accessible to the public and to persons skilled in the pertinent art”⁷³ Therefore, dissemination of physical copies can serve as evidence of public accessibility, which is the “touchstone” to whether a reference is a printed publication.⁷⁴

The Federal Circuit’s literal construction of “dissemination” proved fatal for the applicants in *Klopfenstein*.⁷⁵ In that case, the applicants presented a slide presentation at a conference, which was printed and displayed on poster boards for two and a half days there, and then for less than a day at Kansas State University.⁷⁶ The Board of Patent Appeals and Interferences affirmed the examiner’s rejection because “the full invention . . . was made publicly accessible to those of ordinary skill in the art by the . . . reference [before the critical date] and that this introduction into the public domain of disclosed material via printed display represented a ‘printed publication’ under [§ 102(b)].”⁷⁷ Before the Federal Circuit, the inventors argued that the reference was not a printed publication because: (1) hard copies were not disseminated at the conference;⁷⁸ and (2) the slides were neither catalogued nor indexed in a library database.⁷⁹ The appellants relied on *In re Cronyn*, in which the

traditional dichotomy between “printing” and “publication” is no longer valid. Given the state of technology . . . the “probability of dissemination” of an item very often has little to do with whether or not it is “printed” in the sense of that word when it was introduced into the patent statutes in 1836. In any event, interpretation of the words “printed” and “publication” to mean “probability of dissemination” and “public accessibility,” respectively, now seems to render their use in the phrase “printed publication” somewhat redundant.

Wyer, 655 F.2d at 226 (C.C.P.A. 1981) (citation omitted) (footnote omitted).

71. See *supra* notes 55-63 and accompanying text.

72. *Wyer*, 655 F.2d at 226.

73. *Id.* For a discussion of the hypothetical skilled artisan, see Part IV.C.

74. *In re Hall*, 781 F.2d 897, 898 (Fed. Cir. 1986) (quoted in *Norian Corp. v. Stryker Corp.*, 363 F.3d 1321, 1330 (Fed. Cir. 2004)).

75. *In re Klopfenstein*, 380 F.3d 1345, 1348 n.3 (Fed. Cir. 2004).

76. *Id.* at 1347.

77. *Id.*

78. But if copies of the reference are made available, the reference might be a printed publication even if six or fewer attendees request a copy. See *Mass. Inst. of Tech. v. AB Fortia*, 774 F.2d 1104, 1109 (Fed. Cir. 1985) (holding that a paper orally presented at a scientific meeting open to all persons with written copies available upon request without restriction, and actually distributed to six persons, is a printed publication).

79. *Klopfenstein*, 380 F.3d at 1346-47.

court held that the undergraduate student theses at issue were not § 102(b) publications because “they had not been either catalogued or indexed in [any] meaningful way.”⁸⁰ Nevertheless, the Federal Circuit rejected the appellants’ narrow definition of “dissemination.”

While the *Cronyn* court held “dissemination” to be necessary to finding something to be a “printed publication”, [sic] the court there used the word “disseminate” in its literal sense, i.e. “make widespread” or “to foster general knowledge of.” *Webster’s Third New International Dictionary* 656 (1993). The court did not use the word in the narrower sense the appellants have employed it, which requires distribution of reproductions or photocopies.⁸¹

After the panel made clear that the distribution of copies is not required,⁸² the court clarified any ambiguity in the prior case law:

Thus, throughout our case law, public accessibility has been the criterion by which a prior art reference will be judged for the purposes of § 102(b). Oftentimes courts have found it *helpful* to rely on distribution and indexing as proxies for public accessibility. But when they have done so, *it has not been to the exclusion of all other measures of public accessibility*. In other words, distribution and indexing are not the only factors to be considered in a § 102(b) “printed publication” inquiry.⁸³

So *Klopfenstein* introduced no substantive changes to the § 102(b) printed publication doctrine,⁸⁴ although it reminds inventors to include slide presentations as prior art disclosed to the USPTO during prosecution.⁸⁵ Nevertheless, the decision caused TTOs and other

80. *In re Cronyn*, 890 F.2d 1158, 1161 (Fed. Cir. 1989).

81. *Klopfenstein*, 380 F.3d at 1348 n.3.

82. *Id.* at 1348. “Even if the cases cited by the appellants relied on inquiries into distribution and indexing to reach their holdings, they do not limit this court to finding something to be a ‘printed publication’ *only* when there is distribution and/or indexing.” *Id.*

83. *Id.* at 1350 (emphasis added).

84. Some commentators read the case differently. See, e.g., Katherine E. White, *An Efficient Way to Improve Patent Quality for Plant Varieties*, 3 NW. J. TECH. & INTELL. PROP. 79, 91 (2004) (“The holding in *Klopfenstein* further reveals the Federal Circuit’s willingness to look at prior art more expansively than in the past.”); Bagley, *supra* note 15, at 221 (“[O]ther judicial, legislative, and commercial developments point toward an even bleaker future for academic disclosure in the sciences. . . . *Klopfenstein* seems sure to result in a further stifling of scholarly discourse prior to the filing of patent applications.”); Ricks, *supra* note 15, at 861 (“[T]he court’s decision has serious implications for future applications of the printed publication doctrine, particularly as it relates to those who make presentations at professional conferences or trade shows.”).

85. An applicant’s failure to disclose material information to the USPTO during patent prosecution may lead to a finding of inequitable conduct, which can render a patent unenforceable. See *Brasseler, U.S.A. I, L.P. v. Stryker Sales Corp.*, 267 F.3d 1370, 1380 (Fed. Cir. 2001) (“To

observers to panic because they mistakenly understood the “college thesis cases” to stand for the proposition that § 102(b) *required* the distribution of physical copies.⁸⁶ *Klopfenstein* does show, however, that the Federal Circuit, like its predecessor court, will not subordinate substance to form in the § 102(b) analysis.⁸⁷ The focus of the inquiry

avoid a finding of inequitable conduct, *doubts concerning whether information is material should be resolved in favor of disclosure.*”) (emphasis added) (citation omitted). Inequitable conduct is a defense raised by an accused infringer in almost every patent case. See *Ferring B.V. v. Barr Lab., Inc.*, 437 F.3d 1181, 1196 (Fed. Cir. 2006) (Newman, J., dissenting) (“[T]he habit of charging inequitable conduct in almost every major patent case has become an absolute plague.”) (quoting *Burlington Indus. v. Dayco Corp.*, 849 F.2d 1418, 1422 (Fed. Cir. 1988)). To determine if inequitable conduct has occurred, the court applies a two-step factual analysis followed by a balancing test:

Applicants for patents have a duty to prosecute patents in the PTO with candor and good faith, including a duty to disclose information known to the applicants to be material to patentability. 37 C.F.R. § 1.56(a) (2004); *see also* *Molins PLC v. Textron, Inc.*, 48 F.3d 1172, 1178 (Fed. Cir. 1995). A breach of this duty may constitute inequitable conduct, which can arise from an *affirmative misrepresentation of a material fact, failure to disclose material information*, or submission of false material information, coupled with an intent to deceive or mislead the PTO. A party asserting that a patent is unenforceable due to inequitable conduct must prove materiality and intent by clear and convincing evidence. *Kingsdown Med. Consultants, Ltd. v. Hollister, Inc.*, 863 F.2d 867, 872 (Fed. Cir. 1988) [(en banc), *cert. denied*, 490 U.S. 1067 (1989)]. Once threshold findings of materiality and intent are established, the trial court must weigh them to determine whether the equities warrant a conclusion that inequitable conduct occurred.

Purdue Pharma L.P. v. Endo Pharms. Inc., 438 F.3d 1123, 1128 (Fed. Cir. 2006) (emphasis added) (citations omitted). In *PerSeptive Biosys., Inc. v. Pharmacia Biotech, Inc.*, a district court found that an inventor intentionally misrepresented both the presence of slides at a brief conference talk and important dates relevant to § 102(b). 12 F.Supp.2d 69, 127-30 (D. Mass. 1998). The Federal Circuit held that the district court did not abuse its discretion in holding the patent unenforceable. *PerSeptive Biosys., Inc. v. Pharmacia Biotech, Inc.*, 225 F.3d 1315, 1322-23 (Fed. Cir. 2000).

86. *See, e.g.*, *Gulliksen v. Halberg*, 75 USPQ 252, 256 (B.P.A.I. 1937) (holding that a single copy of a thesis in a public library is a “printed publication”); *Ex parte Hershberger*, 96 USPQ 54 (B.P.A.I. 1953) (same); *In re Bayer*, 568 F.2d 1357 (C.C.P.A. 1978) (granting patentee’s application for a chemical compound because the probability of public accessibility was small since only the library staff and the graduate committee had access to the thesis on the critical date); *In re Hall*, 781 F.2d 897 (Fed. Cir. 1986) (holding that a single copy of a dissertation catalogued in a library was a “printed publication” because it was “publicly accessible” several months before the critical date); *In re Cronyn*, 890 F.2d 1158, 1161 (Fed. Cir. 1989) (holding that three undergraduate theses were not printed publications under § 102(b) because they had neither been catalogued nor indexed in a meaningful way and were not accessible to the public).

87. *Cf.* Advisory Commission on Patent Law Reform, U.S. Dep’t of Commerce, Report to the Secretary of Commerce 47 (1992). (“[P]rior public disclosure of the substance of an invention serves as the most fundamental bar to the ability of an inventor to obtain patent protection.”). The most famous and most cited example of an appellate court adopting the “substance over form” mantra in a patent case came when the Supreme Court articulated the doctrine of equivalents:

One who seeks to pirate an invention, like one who seeks to pirate a copyrighted book or play, may be expected to introduce minor variations to conceal and shelter the piracy. Outright and forthright duplication is a dull and very rare type of infringement. *To prohibit no other would place the inventor at the mercy of verbalism and would be*

remains the same: Sufficient accessibility to the interested public.⁸⁸

IV. CAN THE RUN-OF-THE MILL RESEARCH TALK SURVIVE A *KLOPFENSTEIN* ANALYSIS?

A. Overview

Although *Klopfenstein* does not substantively change the § 102(b) inquiry,⁸⁹ the Federal Circuit has “added another refinement to a series of cases drawing fine distinctions as to how widely academic researchers may promulgate their findings in collegial presentations without starting the one-year time clock ticking for filing a patent application (or losing rights in the invention) by virtue of having created a ‘printed publication.’”⁹⁰ In *Klopfenstein*, the Federal Circuit held that lecture slides displayed in a poster presentation, which was neither distributed nor indexed, were nonetheless “sufficiently publicly accessible” to count as a § 102(b) printed publication.⁹¹ The court considered four factors in its analysis, which were: (1) “the length of time the display was exhibited;” (2) “the expertise of the target audience;” (3) “the existence (or lack thereof) of reasonable expectations that the material displayed would not be copied;” and (4) “the simplicity or ease with which the material displayed could have been copied.”⁹²

Although many professors know that a formal presentation at a research conference may adversely affect patentability,⁹³ less formal presentations, including “chalk talks,”⁹⁴ may also trigger the § 102(b)

subordinating substance to form. It would deprive him of the benefit of his invention and would foster concealment rather than disclosure of inventions, which is one of the primary purposes of the patent system.

Graver Tank & Mfg. Co. v. Linde Air Prods. Co., 339 U.S. 605, 607 (1950) (emphasis added). The mantra is also used in other contexts. See, e.g., 5 ANTHONY WILLIAM DELLER, DELLER'S WALKER ON PATENTS § 453, at 361 (2d ed. 1972) (“Anything in tangible form that may properly be relied upon . . . in support of a rejection on a matter of *substance, not form*, of a claim in a pending application for patent.”) (emphasis added).

88. See discussion, *supra* note 20.

89. See *supra* Part III.B.

90. *Ayaz*, *supra* note 31.

91. *In re Klopfenstein*, 380 F.3d 1345, 1350 (Fed. Cir. 2004).

92. *Id.*

93. Many universities provide explicit warnings in their patent policies. For an example, see *supra* note 45 and accompanying text (excerpting Georgetown's patent policy, which appears in the faculty handbook).

94. A “chalk talk” is a lecture given with a piece of chalk and a clean blackboard (or a marker and a blank overhead transparency). The “chalk talk” is a “less formal,” “more interactive” talk which gives the speaker and the audience “more opportunity to explore ideas, direction of work, and

printed publication bar.⁹⁵ Informal research talks, like formal conference presentations, incorporate visual aids,⁹⁶ which lie at the heart of the § 102(b) analysis.⁹⁷ These references often convey more useful information than the speaker's words because scientists rely on diagrams and drawings to understand complex concepts, to visualize spatial relationships, and to create mental models.⁹⁸ But visual aids may prove fatal for the unwary inventor. If a diagram or drawing discloses the essential elements of the patent claim, the reference could either bar patentability or invalidate an issued patent. Because informal research talks occur frequently in academic science and tend to follow the same basic form,⁹⁹ professors and TTOs need to know if these presentations

some perspective of the field.” Jim Austin, *You've Worked Hard to Get This Far*, (Nov. 22, 2002), http://sciencecareers.sciencemag.org/career_development/previous_issues/articles/2030/you_ve_worked_hard_to_get_this_far (explaining that a faculty candidate in a science department is often asked to give a “chalk talk” to a mock class as part of the on-campus interview). “Chalk talks” are invaluable during the question-and-answer portion of a seminar:

In all of this we have ignored the one time-tested visual that has served scientific speakers for centuries: the blackboard. In many settings, there will, of course, be no blackboards. Where they are available, blackboards are most useful during the question and answer period that follows most talks. Then, blackboards are invaluable to draw new relationships, structures, and so on, that were not included in the talk but are needed to illustrate answers to questions from the audience.

IVAN VALIELA, *DOING SCIENCE: DESIGN, ANALYSIS, AND COMMUNICATION OF SCIENTIFIC RESEARCH* 153-54 (Oxford Univ. Press 2001).

95. This Article focuses on informal research talks. For an analysis of the § 102(b) printed publication bar to formal science presentations at research conferences, see Ricks, *supra* note 15.

96. See *supra* note 32 and accompanying text (discussing visual aids).

97. “Most scientific presentations use visual aids—and almost all scientific presentations are casual and extemporaneous.” Schoeberl, *supra* note 27. Scientific presentations with no visual aids are nearly nonexistent; but, nonetheless, “it is important to note that an entirely oral presentation at a scientific conference that includes neither slides nor copies of the presentation is without question not a ‘printed publication’ for the purposes of 35 U.S.C. § 102(b).” *In re Klopfenstein*, 380 F.3d 1345, 1349 n.4 (Fed. Cir. 2004).

98. For example, chemists use Lewis diagrams as the principal method to convey information about molecules. Chemists use Lewis diagrams to explain reactivity, to predict reactive sites, to describe bonding, and to convey information about bonding that words cannot. Dr. Gilbert N. Lewis, Dean of the College of Chemistry at the UC Berkeley and one of America's greatest and most influential chemists, introduced his electron-dot diagrams to the chemistry community in 1916. See generally G. N. Lewis, *The Atom and the Molecule*, 38 J. AMER. CHEM. SOC. 762-85 (1916) (explaining the theory that a covalent bond consists of a shared pair of electrons); G. N. LEWIS, *VALENCE AND THE STRUCTURE OF ATOMS AND MOLECULES* (Chemical Catalog Co. 1923) (same).

99. Professor Chad Orzel describes how talks about synthetic organic chemistry, for example, invariably follow the same four-stage basic form:

Stage One: “Here's this thing we're trying to make.” This is usually accompanied by a picture consisting of a bunch of hexagons, and maybe a ribbon diagram or some other three-dimensional model. Stage One will occasionally include an explanation of why they're trying to make whatever the thing is, but don't count on it.

Stage Two: “Here's the stuff we start with.” This will include a couple of diagrams

can survive a *Klopfenstein* analysis.¹⁰⁰

B. The “Duration of the Display” Factor

“The duration of the display is important in determining the opportunity of the public in capturing, processing and retaining the information conveyed by the reference.”¹⁰¹ A court is less likely to find that a transient display, as compared to a lengthy display, is a printed publication.¹⁰² The *Klopfenstein* court cited *Regents of the Univ. of California v. Howmedica*,¹⁰³ where the trial judge found that a transient display of lecture slides was not a printed publication under § 102(b), even if the slides described the essential elements of the patent claims.¹⁰⁴ At the other end of the spectrum is the reference in *Klopfenstein*, which the inventor displayed for three days.¹⁰⁵ *Howmedica* and *Klopfenstein* show that the mere display of slides accompanying an oral presentation is not per se a “printed publication;” however, the longer a reference is

showing different arrangements of hexagons. The jargon will get pretty thick, here, but almost all the strange words will be names of different parts and sub-parts of molecules.

...

Stage Three: “Here are the steps in the process.” This will include at least one slide showing multiple diagrams of hexagons, with arrows between them. The jargon will again be pretty thick, but here, all the strange words will refer to methods of sticking pieces of molecules together. . . .

Stage Four: “Here are some graphs to prove we ended up what we wanted.” This is the stage with the greatest variety of slides. Data graphs may include (but are not limited to) pictures of chart recorder traces, blobby photographs of electrophoresis gels, or pictures of pencil marks made on chromatography films. You’ll also get the occasional bar graph or scatter plot.

Posting of Chad Orzel of Notes Toward a User’s Guide to Synthetic Chemistry Talks to Scienceblogs, http://scienceblogs.com/principles/2006/03/notes_toward_a_users_guide_to.php (Mar. 24, 2006, 3:19 p.m.).

100. The *Klopfenstein* factors have been applied elsewhere outside of the poster presentation context. See, e.g., Zhichong Gu, *MercExchange v. eBay: Should Newsgroup Postings Be Considered Printed Publications as a Matter of Law in Patent Litigation?*, 35 GOLDEN GATE U.L. REV. 225, 250 (2005) (analyzing the *Klopfenstein* factors to determine if a newsgroup is a printed publication under § 102(b)).

101. *In re Klopfenstein*, 380 F.3d 1345, 1350 (Fed. Cir. 2004).

102. *Id.* at 1350-51 (“The more transient the display, the less likely it is to be considered a ‘printed publication.’ . . . Conversely, the longer a reference is displayed, the more likely it is to be considered a ‘printed publication.’”) (citation omitted).

103. *Regents of the Univ. of California v. Howmedica, Inc.*, 530 F.Supp. 846, 860 (D.N.J. 1981), *aff’d*, 676 F.2d 687 (3d Cir. 1982) (unpublished table decision).

104. *Id.* at 850. Unfortunately, the district court, in its findings of fact, did not give the exact time that each slide was displayed during the presentation. *Id.* at 848-52.

105. See *Klopfenstein*, 380 F.3d at 1351 (“[T]he Liu reference was displayed for a total of approximately three days. It was shown at the AACC meeting for approximately two and a half days and at the AES at Kansas State University for less than one day.”).

displayed, the more likely it is to trigger § 102(b).¹⁰⁶

Oral research talks tend to include transient displays of lecture slides that may last from thirty seconds to several minutes per slide.¹⁰⁷ The rule of thumb is to allow at least one minute per slide,¹⁰⁸ although some speakers give the audience several minutes to “absorb” each slide.¹⁰⁹ The actual display time depends on factors such as the complexity of the substantive material, font size, and whether the substantive content is new or background material.¹¹⁰ However, the limited duration of these lecture presentations is not dispositive. Many scientists follow the “rule of three” when planning and delivering a talk: “[T]ell em what you’re going to tell em, tell em, and tell em what you told em.”¹¹¹ So, to the extent that retention and comprehension are key factual issues, a reference displayed from thirty seconds to several minutes may in fact be “sufficiently accessible” to a person of ordinary skill in the art.¹¹²

C. *The “Expertise of the Target Audience” Factor*

The audience’s expertise “can help determine how easily those who viewed it could retain the displayed material.”¹¹³ The key question is whether members of the intended audience possess “ordinary skill in the

106. *See id.* (“[T]he longer a reference is displayed, the more likely it is to be considered a ‘printed publication.’”).

107. “Slides” is used in a broad sense to include 35mm slides, “slides” created with presentation software like Microsoft PowerPoint, and overhead transparencies.

108. *See, e.g.,* Andrew S. Kane, *Scientific Communication Techniques*, (2003), <http://aquaticpath.umd.edu/scicom/SciCom-handout.pdf> (“Avoid using more than 1 slide per minute of talk, on average.”); Biology Student Handbook, Guidelines for Oral Presentations, Albertson College, <http://www.albertson.edu/academics/biology/Resources/handbook> (last visited Apr. 25, 2006) (“A general rule of thumb—1 slide for each minute of your presentation. Do not plan on including every item from your research paper in your presentation.”).

109. *See, e.g.,* James C. Garland, *Advice to Beginning Physics Speakers*, PHYSICS TODAY, July 1999, at 43, available at <http://www.physics.ohio-state.edu/~kagan/phy596/Presentations/AdviceToBeginningPhysicsSpeakers.pdf>. (“Although you needn’t adhere to hard and fast rules, as a practical matter you should allow several minutes for an audience to absorb each transparency.”).

110. *See, e.g.,* Biology Student Handbook, *supra* note 108 (“Slides must be visually simple in order to be understood in a short time that they are to be viewed by the audience. A good slide is self-explanatory when viewed for 15 to 30 seconds. This means that axes and other lines must be clearly labeled with both conceptual and unit terms. Do not use font smaller than 18-20. Avoid putting too much information on your slides.”).

111. Bob Zink and Carla Cicero, *Thoughts for Students on Oral & Poster Presentations*, <http://www.fieldmuseum.org/aou/oraltalk.htm> (last visited Apr. 26, 2006) (discussing the “rule of three”).

112. *See infra* Part IV.C.

113. *In re Klopfenstein*, 380 F.3d 1345, 1351 (Fed. Cir. 2004).

art.”¹¹⁴ The hypothetical person having ordinary skill in the art, a legal construct akin to the “reasonable person” used as a reference in negligence determinations,¹¹⁵ is presumed to know all of the contents of the relevant prior art.¹¹⁶ This legal construct “is a prism or lens through which a judge, jury, or the [Board of Patent Appeals and Interferences] views the prior art and the claimed invention.”¹¹⁷ By imposing an objective standard, this reference point prevents the factfinders from introducing their own insight or hindsight into the process.¹¹⁸ The Federal Circuit explains how to construct the hypothetical person as follows:

Factors that may be considered in determining level of ordinary skill in the art include: (1) the educational level of the inventor; (2) type of problems encountered in the art; (3) prior art solutions to those problems; (4) rapidity with which innovations are made; (5) sophistication of the technology; and (6) educational level of active workers in the field.¹¹⁹

The hypothetical person having ordinary skill in the art “would, of necessity have the capability of understanding the scientific and engineering principles applicable to the pertinent art,”¹²⁰ but need not be “persons working in the field of the invention [who] are likely to be familiar with the relevant literature.”¹²¹

114. In patent law, the perspective of “one of ordinary skill in the art” is applied to judge obviousness, enablement, and other issues related to patentability. *See, e.g.*, 35 U.S.C. § 103(a) (2000) (“A patent may not be obtained though the invention is not identically disclosed or described as set forth in § 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having *ordinary skill in the art* to which said subject matter pertains.”) (emphasis added); *Graham v. John Deere Co.*, 383 U.S. 1, 15 (1966) (describing the factual inquires required to determine nonobviousness).

115. *See In re Rouffet*, 149 F.3d 1350, 1357 (Fed. Cir. 1998) (describing the hypothetical person). The legal construct “also presumes that all prior art references in the field of the invention are available to this hypothetical skilled artisan.” *Id.*

116. *See In re Carlson*, 983 F.2d 1032, 1037 (Fed. Cir. 1992) (“[T]he hypothetical person of ordinary skill in the art . . . is charged with knowledge of all the contents of the relevant prior art.”) (citing *Kimberly-Clark Corp. v. Johnson & Johnson*, 745 F.2d 1437, 1454 (Fed. Cir. 1984); *In re Hall*, 781 F.2d 897, 899-900 (Fed. Cir. 1986)).

117. *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001), *cert. denied*, 534 U.S. 1128 (2002).

118. *See id.*

119. *Environmental Designs, Ltd. v. Union Oil Co.*, 713 F.2d 693, 696 (Fed. Cir. 1983), *cert. denied*, 464 U.S. 1043 (1984).

120. Manual of Patent Examining Procedure (“MPEP”) § 2141.03 (8th ed., Rev. 4, Oct. 2005) (quoting *Ex parte Hiyamizu*, 10 USPQ2d 1393, 1394 (B.P.A.I. 1988)).

121. *Helefix Ltd. v. Blok-Lok, Ltd.*, 208 F.3d 1339, 1347 (Fed. Cir. 2000) (reversing a district court’s determination that a person of ordinary skill in the art is familiar with all of the pertinent

Members of the audience who are persons of ordinary skill in the art are more likely to retain the displayed material than those who are not.¹²² The *Klopfenstein* court followed the reasoning of Judge Learned Hand, who stated in a patent case that a reference, “*however ephemeral its existence, may be a printed publication if it goes direct to those whose interests make them likely to observe and remember whatever it may contain that is new and useful.*”¹²³ Following this reasoning, the transient display of slides characteristic of a run-of-the-mill research talk can be a printed publication for § 102(b) purposes since members of the audience: (1) do not need much time to comprehend the disclosure; and (2) tend to remember what they have seen. Thus, the durational prong and the expertise prong are extensively intertwined.

An inventor can assume that an audience of interested scientists is comprised of persons of ordinary skill in the art. The attendees often possess the technical knowledge, academic pedigrees, and a level of expertise that is commensurate in scope to that of the inventor and other researchers in the field.¹²⁴ Indeed, the inventor’s audience most likely includes fellow Ph.D. scientists who understand the “type[s] of problems encountered in the art,” the “prior art solutions to those problems,” and the “sophistication of the technology.”¹²⁵ Ph.D. scientists generally do not need much time to comprehend the disclosure and, therefore, leave the presentation remembering what they have seen.

D. The “Protective Measures” Factor

Where professional norms entitle the patentee to a reasonable expectation that the information displayed will not be copied, the court is more reluctant to find that the reference is a printed publication.¹²⁶

literature).

122. See *In re Klopfenstein*, 380 F.3d 1345, 1351 (Fed. Cir. 2004) (determining that attendees at the research conference satisfied this prong because they were, objectively, persons of ordinary skill in the art).

123. *Id.* (quoting *Jockmus v. Leviton*, 28 F.2d 812, 813-14 (2d Cir. 1928)) (internal quotation marks omitted) (emphasis added).

124. See, e.g., *Eli Lilly & Co. v. Zenith Goldline Pharm., Inc.*, 364 F. Supp.2d 820, 846 (S.D. Ind. 2005) (stating that in a drug-related patent infringement suit, “[a] person of ordinary skill in the art in this case would be a scientist with a Ph.D. in medicinal chemistry, pharmacology, or a similar discipline”); *Synbiotics Corp. v. Heska Corp.*, 137 F. Supp.2d 1198, 1208 (S.D.Cal. 2000) (finding that academic Ph.D. scientists, including the co-author of an invalidating reference, were persons of ordinary skill in the art in a patent infringement suit).

125. See *supra* note 119 and accompanying text (explaining how the court determines the hypothetical person of ordinary skill in the art).

126. *Klopfenstein*, 380 F.3d at 1351 (“Whether a party has a reasonable expectation that the information it displays to the public will not be copied aids our § 102(b) inquiry. Where

Although "this reluctance helps preserve the incentive for inventors to participate in academic presentations or discussions,"¹²⁷ the court nonetheless encourages the inventor to take protective measures to create the reasonable expectation that the information will not be copied.¹²⁸

In the seminar context, protective measures could include a simple disclaimer that "inform[s] members of the viewing public that no copying of the information will be allowed or countenanced."¹²⁹ In *Klopfenstein*, the inventors failed to create the reasonable expectation because they took no protective measures to prevent note taking.¹³⁰ Because the court did not need to consider a fact situation where protective measures were actually taken it is difficult to elucidate the contours of reasonable expectation. Protective measures may simply create an inference which the patent examiner or infringer can rebut with evidence of actual copying. The reasonableness of the expectation, like other aspects of the printed publication inquiry, must be analyzed on a case-by-case basis.¹³¹ For example, a simple disclaimer may be reasonable for a small audience where the inventor can monitor copying, but unreasonable for large groups that cannot be effectively policed.

In a report to the Secretary of Commerce on the basis for the § 102(b) grace period, the Advisory Commission on Patent Law Reform noted that in academic science, "[l]ong and firmly established traditions . . . encourage open and free communication through early publication and dissemination of the results of scientific research."¹³² A prohibition on taking notes is antithetical to scientific discourse because it would thwart openness, collegiality,¹³³ and the "free flow of ideas."¹³⁴ Indeed,

professional and behavioral norms entitle a party to a reasonable expectation that the information displayed will not be copied, we are more reluctant to find something a 'printed publication.'").

127. *Id.*

128. *Id.* "Where parties have taken steps to prevent the public from copying temporarily posted information, the opportunity for others to appropriate that information and assure its widespread public accessibility is reduced." *Id.*

129. *Id.*

130. *Id.*

131. *Klopfenstein*, 380 F.3d. at 1350 ("The determination of whether a reference is a 'printed publication' under 35 U.S.C. § 102(b) involves a case-by-case inquiry into the facts and circumstances surrounding the reference's disclosure to members of the public.") (citing *In re Cronyn*, 890 F.2d 1158, 1161 (Fed. Cir. 1989); *In re Hall*, 781 F.2d 897, 899 (Fed. Cir. 1986)).

132. Advisory Commission on Patent Law Reform, U.S. Dep't of Commerce, Report to the Secretary of Commerce 47 (1992).

133. "Collegiality" is a subjective term that has been defined as "the capacity to relate well and constructively to the comparatively small bank of scholars on whom the ultimate fate of the university rests." *Mayberry v. Dees*, 663 F.2d 502, 514 (4th Cir. 1981) (introducing "collegiality" into higher education case law as a legitimate criterion for promotion and tenure), *cert. denied*, 459

taking notes and asking questions define what it means to “actively participate” in a seminar. Scientists copy slides and take notes not only to understand complex schemes,¹³⁵ but also to generate ideas for their own research.¹³⁶ Therefore, although protective measures would allay the patentability-related fears of many TTOs, professors might view any university patent policy that mandates protective measures as stifling scholarship or as an intrusion into academic freedom. At the very least, prohibiting note taking would adversely affect the collegial interchange and the open flow of ideas between the inventor and his peers.¹³⁷ Thus, protective measures would significantly alter the way professors talk about science.¹³⁸

U.S. 830 (1982). See also Mary Ann Connell & Frederick G. Savage, *The Role of Collegiality in Higher Education Tenure, Promotion, and Termination Decisions*, 27 J.C. & U.L. 833, 834 (2001) (“While most institutions do not specify collegiality as a distinct criterion for tenure or promotion, many include within the teaching or service components a requirement that the candidate ‘work well with colleagues,’ ‘demonstrate good academic citizenship,’ or ‘contribute to a collegial atmosphere.’”); FRANKLIN SILVERMAN, *COLLEGIALITY AND SERVICE FOR TENURE AND BEYOND: ACQUIRING A REPUTATION AS A TEAM PLAYER* vii (Praeger Publishers 2003) (providing assistant professors and graduate students contemplating an academic career with practical information that will help them meet collegiality and service expectations for promotion and tenure).

134. Some commentators argue that university technology transfer compromises faculty and stifles the free flow of ideas:

Another matter of concern commonly raised by critics of university technology transfer is that the *free flow of ideas* in the academic world is stifled by the focus on commercialization of inventions and innovations. Many in the academic community insist that it is imperative that discoveries are published immediately and that information is shared openly. Companies that work with university researchers, on the other hand, often demand delays in the publication and sharing of discoveries and ideas. In order to protect the value of proprietary information, it is often necessary to avoid publication, or other forms of sharing of information and data, until proper intellectual property protection is in place.

Gordon, *supra* note 10, at 648 (emphasis added) (footnotes omitted).

135. See, e.g., J. Gregory Trafton & Susan B. Trickett, *Note-Taking for Self-Explanation and Problem Solving*, in 16 HUMAN-COMPUTER INTERACTION 1, 4 (2001) (“One strategy that may help learners as they solve problems is taking notes. Note-taking is a very general strategy that has been well studied in a number of traditional learning environments . . .”).

136. What a scientist hears in a lecture can lead to major discoveries:

An accidental observation followed by a little detective work has led to the discovery [of a novel organic synthetic pathway] . . . [Professor Josef Michl] happened to hear a lecture by Timothy Clark of the University of Erlangen-Nuremberg, in Germany, in which he mentioned in passing a prediction he had made in a computational paper in 1986 “A bulb lit in my brain . . .” [And, interestingly,] no one seems to have pursued Clark’s idea

Steve Ritter, *New Radical Route To Polyolefins: Weakly Solvated “Naked” Li⁺ Promotes Novel Radical Polymerization of Alkenes*, CHEMICAL & ENG’G NEWS, Apr. 24, 2006, at 11, available at <http://pubs.acs.org/cen/news/84/i17/8417notw4.html>.

137. Cf. Ricks, *supra* note 15, (“This extra need for precautions may have repercussions on the amount of ‘open and free communication’ in the scientific community.”).

138. The Federal Circuit did not envision this conclusion. See *In re Klopfenstein*, 380 F.3d

E. The “Ease of Copying” Factor

Here, the court determines the ease or simplicity with which a member of the audience can copy the display.¹³⁹ “The more complex a display, the more difficult it will be for members of the public to effectively capture its information,” but “[t]he simpler a display is, the more likely members of the public could learn it by rote or take notes adequate enough for later reproduction.”¹⁴⁰ To evaluate complexity, the court considers both the substantive content of the reference and, in the case of lecture slides, the content of each slide.¹⁴¹ In *Klopfenstein*, the court found that only eight out of fourteen slides contained substantive information.¹⁴² Of this number, “only a few slides presented would have needed to have been copied by an observer to capture the novel information presented by the slides,”¹⁴³ and each of these slides contained no more than three short bullets.¹⁴⁴ Thus, “the reference itself was presented in such a way that copying of the information it contained would have been a relatively simple undertaking for those to whom it was exposed”¹⁴⁵

The way that a reference is presented during a research talk is trivial for purposes of comprehension or copying. Research talks are such a fundamental forum for scientific discourse that the ordinary Ph.D. scientist can copy or “capture the novel information presented by the slides”¹⁴⁶ with little or no difficulty.¹⁴⁷ To be sure, scientists can extract

1345, 1351 (Fed. Cir. 2004) (“[The court’s reluctance to find that a reference is a printed publication if the inventor has a reasonable expectation that the information will not be copied] helps preserve the incentive for inventors to participate in academic presentations or discussions.”).

139. *Id.* (explaining the fourth factor).

140. *Id.*

141. *See id.*

142. *See id.* at 1351 (“The Liu reference was made up of 14 separate slides. One slide was a title slide; one was an acknowledgement slide; and four others represented graphs and charts of experiment results. The other eight slides contained [substantive] information presented in bullet point format”).

143. *Id.* at 1351-52.

144. *In re Klopfenstein*, 380 F.3d 1345, 1351 (Fed. Cir. 2004) (“[The eight substantive slides contained] no more than three bullet points to a slide. Further, no bullet point was longer than two concise sentences.”).

145. *Id.* at 1352.

146. *Id.* at 1351-52.

147. Scientists tend to follow certain rules of thumb when preparing visual aids, which include: (1) not exceeding 20% of the total slide area with text; (2) limiting a slide to five lines with no more than five words per line (the “5 × 5 rule”); (3) using a large, conservative font; (4) conveying no more than one idea per slide; (5) avoiding more than one slide per minute of talk; and (6) less is better. *See Kane, supra* note 108 (explaining how to prepare well-designed slide presentation); *Zink, supra* note 111 (same); *Schoeberl, supra* note 27 (same).

substantive information even if the inventor delivers a sloppy talk. When a speaker displays a “busy” slide, he will usually take extra time to explain it.¹⁴⁸ If he does not, a member of the audience will seek clarification immediately or during the question-and-answer period.¹⁴⁹ In short, an attendee rarely leaves a research talk with unanswered questions.¹⁵⁰ Therefore, slide complexity is unimportant.

F. Balancing

Application and balancing of the four factors show that the traditional scientific research talk cannot survive a *Klopfenstein* analysis. Although the display of each substantive slide during a talk is fleeting, a scientist of ordinary skill in the art need not view a slide for an extended period of time to extract the novel information. Copying is a normal and relatively simple undertaking, and restrictions on note taking are uncommon. Even if a disclaimer would preclude note taking, many scientists can remember novelty without handwritten notes. Thus, any visual aids displayed during most research talks are probably “sufficiently publicly accessible to count as a ‘printed publication’ under § 102(b).”¹⁵¹

V. LOOKING FORWARD

In order to avoid the § 102(b) statutory bar and to “assure that a potential invention be afforded the greatest opportunity to obtain the full protection available under the patent laws of various countries and multinational treaties,”¹⁵² an inventor should work with a patent professional and file a patent application before public disclosure.¹⁵³

148. See *supra* Part IV.B (describing the factors that determine how long each slide is displayed).

149. See sources cited *supra* notes 93, 95, 96, 107-110, 146-147 (describing the question-and-answer period).

150. Many presenters will “hang around” after the talk to answer remaining questions or to elaborate on the research in greater detail.

151. *In re Klopfenstein*, 380 F.3d 1345, 1352 (Fed. Cir. 2004).

152. AVERY N. GOLDSTEIN, *Preface* to PATENT LAW FOR SCIENTISTS & ENGINEERS, vi (Avery N. Goldstein ed., Taylor & Francis 2005).

153. See, e.g., Rothenberg, *supra* note 11 (“To avoid the creation of a statutory bar to patentability by a scientific presentation, the most desirable course of action is the filing of a patent application . . . prior to the presentation.”). Filing after the statutory grace period can initiate a disastrous chain of events, as one patent attorney explains:

It could be bad, and it could be very, very bad. At a minimum, people potentially or actually concerned with your patent, whether as licensees, infringers, or investors, will discover this pre-critical date activity and think your patent’s value is very questionable. At worst, [if an accused infringer can prove inequitable conduct], the accused infringer

Applying for a patent, however, is a long and tedious process because a patent attorney often requires months to search the prior art, to draft claims, and to file the requisite documents with the USPTO.¹⁵⁴ Moreover, considering the requisite back-and-forth correspondence with the USPTO,¹⁵⁵ prosecuting a patent that withstands litigation¹⁵⁶ is a slow, expensive process, which often takes years.¹⁵⁷

A. A Possible Solution: The Provisional Patent Application

1. Overview

As an alternative to an ordinary application, the Patent Act now allows an inventor to file a provisional application with the USPTO.¹⁵⁸ A provisional application allows an inventor to establish priority to an invention by submitting a specification, drawing, and a minimal filing fee.¹⁵⁹ A provisional application requires no claims¹⁶⁰ and is not examined.¹⁶¹ The inventor must, however, submit a regular,

could win an award entitling it to have *you* pay its attorney fees, and . . . having won on the patent claim, now has a good antitrust claim [which might make *you* liable for treble damages].

Robertta J. Morris, *Inventor Actions That Can Jeopardize Patent Rights*, in *PATENT LAW FOR SCIENTISTS & ENGINEERS* 49, 51 (Avery N. Goldstein ed., Taylor & Francis 2005).

154. See generally IRAH H. DONNER, *PATENT PROSECUTION: PRACTICE & PROCEDURE BEFORE THE U.S. PATENT OFFICE* (4th ed. 2006).

155. See *id.*; DURHAM, *supra* note 58 (explaining the patent prosecution process).

156. See Jennifer Gordon, *Preparing & Prosecuting a Patent That Holds Up In Litigation*, 804 *PLI/Pat* 991, 997 (2004) ("Clients, who rarely budget to prosecute patent applications 'to the hilt,' should be encouraged to heed the old adage, 'An ounce of prevention is worth a pound of cure.' Relatively simple measures taken during the preparation and prosecution of a patent may pay huge dividends in the future.").

157. See sources cited *supra* notes 154-55.

158. Provisional applications have only existed in the U.S. patent laws since 1994. That year, Congress amended the Patent Act "to bring the United States into closer harmony with prevailing international patent laws." Brian I. Marcus, *Provisional Patent Applications, Their Practical Uses & Potential Pitfalls*, 835 *PLI/Pat* 147, 151 (2005). "As a part of the Uruguay Round Agreements Act, the Patent Statute was amended to allow applicants for United States patents to file provisional applications that could provide the priority date for a non-provisional utility application filed within one year of the provisional." *New Railhead Mfg., L.L.C. v. Vermeer Mfg. Co.*, 298 F.3d 1290, 1294 (Fed. Cir. 2002) (citing 35 U.S.C. § 111(b) (2000)).

159. A provisional application shall include "a specification as prescribed by [35 U.S.C. § 112 ¶1]; and a drawing as prescribed by section 113 . . ." 35 U.S.C. § 111(b)(1). "The application must be accompanied by the fee required by law." *Id.* § 111(b)(3)(A).

160. "A claim, as required by the second through fifth paragraphs of section 112, shall not be required in a provisional application." *Id.* § 111(b)(2).

161. *But see infra* Part V.A.2 (describing how a provisional patent application that does not meet the disclosure requirements of 35 U.S.C. § 112 may prove fatal to the patentee).

“nonprovisional” application within one year, or the provisional is automatically abandoned.¹⁶² Filing a provisional application gives the inventor several strategic advantages, including extending the patent term to twenty-one years,¹⁶³ postponing the examination period,¹⁶⁴ trolling for prior art,¹⁶⁵ and avoiding an allegation of inequitable conduct.¹⁶⁶

2. Fulfilling the Statutory Requirements

Although the provisional application provides inventors with an easy and inexpensive mode of entry into the U.S. patent system, the provisional application must satisfy the statutory requirements of 35 U.S.C. § 112, first paragraph,¹⁶⁷ in order for the nonprovisional

162. “[A non-provisional application disclosed] in a provisional application filed under section 111(b) . . . shall have the same effect, as to such invention, as though filed on the date of the provisional application filed under section 111(b) . . . if the [non-provisional application] is filed not later than 12 months after the date on which the provisional application was filed . . .” 35 U.S.C. § 119(e)(1).

163. See, e.g., Marcus, *supra* note 158, at 164 (“[B]y waiting the full year to file the nonprovisional application, applicants may effectively extend their patent term to twenty-one years. While the extra year will be of little value in many instances, certain patents, such as pharmaceutical and pioneering patents, often generate significant revenues for their owners until they expire and the extra year could prove very valuable.”).

164. Deferring examination “postpones the costs and perhaps risks of early examination of a nonprovisional application” by allowing the inventor “to seek financial assistance for patent prosecution or product development, while having the security of a patent application on file with the PTO.” Charles E. Van Horn, *Practicalities and Potential Pitfalls When Using Provisional Patent Applications*, 22 AIPLA Q.J. 259, 297 (1994). Furthermore, “[a]pplicants are more likely to have a better idea of any commercial goals relative to the described invention and are better able to draft claims that define the scope of the invention consistent with the commercial outlook.” *Id.*

165. This strategy removes up to a year of patent-defeating prior art:

At the time the first application regarding given subject matter is filed, the applicant will likely be unaware of the most recently-developed prior art. There is a window of at least eighteen months immediately previous in which relevant prior art applications may have been filed but remain unpublished. For applications not subject to publication, the window between their filing dates and issuance as patents is likely even longer. Accordingly, by the time a patent application is examined, significant previously unpublished unknown prior art may have manifested itself. The prospect of being confronted with such prior art and being forced to responsively amend claims presents both the question of whether the application fortuitously contains the limitations needed to distinguish the prior art and the dark cloud of prosecution history estoppel even if such art can be distinguished. To reduce this problem, even an application that could otherwise have been filed as a nonprovisional application may appropriately be filed as a provisional application.

William B. Slate, *In Defense of the Misunderstood Provisional Application*, 85 J. PAT. & TRADEMARK OFF. SOC’Y 219, 227 (2003).

166. This benefit obtains if the provisional application is filed before the disclosure. See *supra* note 85 and accompanying text.

167. “The specification shall contain a written description of the invention, and of the manner

application to claim the benefit of the earlier filing date.¹⁶⁸

Under 35 U.S.C. § 119(e), the written description and drawing(s) (if any) of the provisional application must adequately support and enable the subject matter claimed in the nonprovisional application that claims the benefit of the provisional application. In *New Railhead Mfg., L.L.C. v. Vermeer Mfg. Co.* [discussed *infra*], the court held that for a nonprovisional application to be afforded the priority date of the provisional application, "the specification of the provisional must 'contain a written description of the invention and the manner and process of making and using it, in such full, clear, concise, and exact terms,' 35 U.S.C. § 112 ¶1, to enable an ordinarily skilled artisan to practice the invention claimed in the nonprovisional application."

. . . .

*If a claim in the nonprovisional application is not adequately supported by the [disclosure in] the provisional application . . . that claim in the nonprovisional application is not entitled to the benefit of the filing date of the provisional application.*¹⁶⁹

Obtaining the earliest filing date is extremely important because "it fixes or freezes the universe of prior art that can be used against the application."¹⁷⁰

Those professors and TTOs who customarily file provisional applications without the "substantive" input of a competent patent attorney or agent jeopardize any benefits they may otherwise obtain from the provisional application. Without competent advice, they often adopt a filing strategy that consists of stapling a cover sheet to a manuscript, journal article, research grant proposal, or another

and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention." 35 U.S.C. § 112 ¶1 (2000). Thus, the statutory requirement is threefold: enablement, best mode, and written description. See generally DURHAM, *supra* note 58 (explaining the requirements of 35 U.S.C. § 112 ¶1).

168. See 35 U.S.C. § 111(b)(1) (2000) ("[A provisional] application shall include a specification as prescribed by [35 U.S.C. § 112 ¶1] . . .").

169. MANUAL OF PATENT EXAMINING PROCEDURE § 201.11(I)(A) (8th ed., Rev. 4, Oct. 2005) (emphasis added) (citations omitted). Therefore, a provisional application "must fully support the later filed non-provisional patent application." Shashank Upadhye, *To Use or Not to Use: Reforming Patent Infringement, The Public Use Bar, and the Experimental Use Doctrine As Applied to Clinical Testing of Pharmaceutical and Medical Device Inventions*, 4 MINN. INTELL. PROP. REV. 1, 60 (2002).

170. Upadhye, *supra* note 169, at 60.

preexisting document.¹⁷¹ The ease of this practice also lays a potential trap for the unwary.¹⁷²

3. The § 102(b) Statutory Bar

A savvy inventor can use a provisional application and the § 102(b) grace period strategically to delay examination of a patent application.¹⁷³ However, this is not the typical case, as one patent attorney explains:

Your client approaches you with a presentation he gave at a recent public conference relating to his new invention. He's not interested in foreign rights, but he would like to file the presentation now as a provisional patent application to preserve his rights in the U.S., and, in a year's time, if he's able to commercialize the invention, he would like to file a utility application claiming priority back to the filing date of the provisional application.¹⁷⁴

If a professor files a nonprovisional application *after* giving a

171. See Slate, *supra* note 165 at 220. ("It is . . . not uncommon to see a provisional application take the form of a cover sheet attached to an existing document Although such filings are often done in-house, they may also be done by outside patent counsel provided with the document and instructed to file it 'as is.'"); Marcus, *supra* note 158, at 155 ("Universities and scientists availed themselves of provisional patent applications to file the text of speeches and academic papers. Large businesses used provisional patent applications as a matter of course to file internal invention disclosure forms generated for inventions by their R&D staff."). This filing strategy has many drawbacks, which include a failure: (1) to "provide adequate support for the ultimately desired claims[;]" (2) to "use different generic terms of varying degrees of specificity which advantageously provide the basis for a chain of dependent claims[;]" and (3) to "provide the broad alternative examples necessary for broad claim interpretation under the Doctrine of Equivalents and of 'means-plus-function' elements under 35 U.S.C. § 112(6)." Slate, *supra*, at 220-21.

172. Patent attorney Shashank Upadhye provides an example:

[S]uppose a provisional patent application discloses subject matter X. Within one year, the applicant files a non-provisional patent application disclosing and claiming subject matters X + Y. Subject matter X has the provisional filing date and subject matter Y has the new filing date. Here, the non-provisional application contains new matter that was not taught in the provisional.

Upadhye, *supra* note 169, at 60-61.

173. For example:

Any entity may benefit from the provisional patent application process. . . . [For example], if one were to assume that the [§ 102(b) triggering event occurred] on Month 0, the inventor would have until Month 12 to file a provisional patent application (or non-provisional patent application for that matter) because of the § 102(b) one-year grace period. Then, because the inventor now has a patent application on file, the inventor can publicly use, sell, demonstrate, or publish the invention. The caveat is that the inventor must file the corresponding non-provisional application by Month 24—within twelve months of the provisional application filing date.

Id. at 56-57 (footnotes omitted).

174. Marcus, *supra* note 158, at 151.

research talk, the professor may lose all patent rights if he mistakenly believes that the disclosure in the provisional application adequately supports the invention.¹⁷⁵

In *New Railhead Mfg., L.L.C. v. Vermeer Mfg. Co.*,¹⁷⁶ New Railhead sued Vermeer for infringing a drill bit.¹⁷⁷ The patented drill bit claimed priority to a provisional application.¹⁷⁸ The parties did not dispute that commercial embodiments of the drill bit were sold more than one year before New Railhead filed the nonprovisional application, which triggered the § 102(b) clock.¹⁷⁹ If the patent was not afforded the earlier priority date, § 102(b) would bar patentability.¹⁸⁰ The Federal Circuit affirmed the trial court's finding that the specification and drawings in the provisional application did not adequately support the claims in the issued patent.¹⁸¹ Accordingly, the court held that the patent was invalid under § 102(b).¹⁸²

A similar result would obtain if a professor makes a public disclosure before filing a provisional application. Conversely, if the professor files the provisional application *before* giving a research talk *and* timely files the nonprovisional, the § 102(b) statutory bar cannot operate.¹⁸³

175. Shashank Upadhye provides another hypothetical:

[S]uppose an inventor on Month 0 publicly used the invention of X + Y. On Month 12, the inventor filed a provisional patent application teaching only X or insufficiently describing Y in the necessary detail. On Month 24, the inventor files the non-provisional patent application claiming X + Y. The patent issues. Now, an infringer may defend on the grounds that the claim to X + Y is invalid because the subject matter Y has a filing date of Month 24, and the public use of X + Y occurred almost 2 years earlier (i.e., Month 0). While any claim to subject matter X only could chain its way from Month 24 to Month 12 properly, the subject matter Y chain stops at Month 24. So, the failure to adequately describe subject matter Y in the provisional means that it cannot serve as an anchor to subject matter Y in the later non-provisional application.

Upadhye, *supra* note 169, at 61.

176. *New Railhead Mfg., L.L.C. v. Vermeer Mfg. Co.*, 298 F.3d 1290 (Fed. Cir. 2002).

177. *Id.* at 1292.

178. *Id.* at 1293.

179. *Id.* at 1294. In other words, the sale occurred before the critical date. *See id.*

180. *See* 35 U.S.C. § 102(b) (2000) (“[An inventor cannot obtain a patent if] the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States . . .”).

181. *New Railhead*, 298 F.3d at 1299. *See* discussion *supra* Part V.A.2.

182. *Id.*

183. In this case, even if the provisional application is statutorily deficient, the nonprovisional would be filed within the § 102(b) grace period. So, although the patentee would not obtain the benefit of the provisional filing date, there is no § 102(b) statutory bar to patentability.

B. Is the Conflict Best Resolved Through Changes in Management Rather Than Through Amendments to the Patent Act?

The extent to which professors will even consider patentability before publicly disclosing research depends on several factors. First, universities that engage in technology transfer should train their science and engineering faculty in the basic tenets of the patent laws.¹⁸⁴ Scientists and engineers “practicing their craft now must be aware of how patent rights are woven through the research process.”¹⁸⁵ Without proper patent protection, a breakthrough discovery “may never reach the public, since investment in the discovery cannot be justified if there is not a time of exclusivity to recoup the cost of investment capital.”¹⁸⁶ If this is done, TTOs could prevent most inadvertent § 102(b) triggering events.

Second, a professor is more likely to think about patentability concerns if he has a stake in the outcome, financial or otherwise. In the eyes of the professor’s colleagues, tenure and promotion committees, and the world of academic science in general, “[p]eer-reviewed publications in archival research journals are the most important measure of the significance of any research activity.”¹⁸⁷ Indeed, most universities will admit that technology transfer “is a business of home runs,”¹⁸⁸ so “[e]xcept in a few cases, where institutions have earned tens of millions of dollars from a single invention, licensing income makes up a tiny percentage of an institution’s revenue base.”¹⁸⁹ Therefore, it is unrealistic for a university to expect a tenure-track professor to delay disclosure in order for the TTO to assess potential licensing opportunities for his research if the university will most likely not seek patent protection.¹⁹⁰

184. See sources cited, *supra* note 2.

185. Goldstein, *supra* note 152, at v.

186. *Id.*

187. Boston Univ. College of Engineering Faculty Expectations, *supra* note 42, at § 2.1. See also New Mexico State University Guidelines, *supra* note 42, § I. (“Publication in refereed scholarly journals precedes other evidence of professional stature.”).

188. Charlotte Crystal, *U.Va. Patent Foundation Upgrades Operations to Better Serve Faculty Inventors and Commercial Clients*, INSIDE UVA ONLINE, Sept. 10-16, 1999, <http://www.virginia.edu/insideuva/1999/28/patent.html> (quoting Robert MacWright, Executive Director).

189. Goldie Blumenstyk, *Deflated Deals: Universities End Up With Worthless Equity When Companies Created in Licensing Deals Go Under*, THE CHRONICLE OF HIGHER ED., May 9, 2003, at A27, available at <http://chronicle.com/weekly/v49/i35/35a02702.html>.

190. To the extent that professors are more willing to share their ideas with faculty colleagues rather than an administrator, each science department or college within the university could designate a professor trained in patent law fundamentals who could make a cursory review of a

Third, universities should nurture the entrepreneurial spirit among their research faculty because university inventor-entrepreneurs are keenly aware of the patent laws.¹⁹¹ This can be done by: (1) Hosting "how-to" seminars; (2) Highlighting successful faculty entrepreneurs on campus; (3) Recruiting successful entrepreneurs to join the faculty; (4) Encouraging professors to start university-sponsored incubators or start-ups;¹⁹² and (5) Rewarding entrepreneurial activities with release time and due credit for tenure and promotion.

Therefore § 102(b) concerns in the academic context are best handled through managerial decision making, not through changing the patent laws. Admittedly, some commentators view *Klopfenstein* as a departure from prior case law that "holds serious implications for future applications of the printed publication bar."¹⁹³ In her Note applying *Klopfenstein* to conference presentations, Cindy Ricks argues that the court's adoption of the "protective measures" and "ease of copying" factors is flawed because the reasoning to prevent note taking and rote memorization, respectively "would apply with equal force to purely oral presentations"¹⁹⁴ Moreover, she argues, because an entirely oral presentation does not trigger § 102(b) as a matter of law,¹⁹⁵ "it is not clear why these factors should cause a slide or poster presentation to be considered a printed publication."¹⁹⁶

Ricks' argument is not without force. Dissemination and accessibility are the keys to the legal determination of whether a reference is published,¹⁹⁷ so arguably members of the public that have a deep interest in the substance of the talk could extract the key elements of the invention with or without visual aids.¹⁹⁸ However, Ricks'

professor's disclosure. If this professor sees promise, he could refer the inventor to the TTO for a more in-depth review.

191. See generally UNIVERSITY SPIN-OFF COMPANIES: ECONOMIC DEVELOPMENT, FACULTY ENTREPRENEURS, AND TECHNOLOGY TRANSFER (Alistair M. Brett et al. eds., 1991) (discussing the role of spin-off companies in commercializing university technology).

192. See *id.*

193. Ricks, *supra* note 15, at 865. "The *Klopfenstein* court's interpretation of 'public dissemination' and 'public accessibility' as meaning, essentially, made known to the interested public for a few days, appears inconsistent with the interpretation of those terms in previous cases." *Id.* at 862.

194. *Id.* at 863.

195. See *In re Klopfenstein*, 380 F.3d 1345, 1349 n.4 (Fed. Cir. 2004) ("[I]t is important to note that an entirely oral presentation at a scientific conference that includes neither slides nor copies of the presentation is without question not a 'printed publication' for the purposes of 35 U.S.C. § 102(b).").

196. Ricks, *supra* note 15, at 863.

197. See *Klopfenstein*, 380 F.3d at 1348.

198. "In particular, there seems to be very little difference between an audience member's

argument fails for two reasons. First, purely oral presentations are essentially nonexistent in academic research talks.¹⁹⁹ Second, at its core, § 102(b) is a loss-of-right provision that statutorily bars the applicant from obtaining a patent because of the inventor's own actions.²⁰⁰ To the extent that visual aids make a presentation easier to copy, photograph, or remember, they also make the presentation more accessible and easier to disseminate to the interested public.²⁰¹ Thus, the distinction between an oral presentation and a slide presentation is a difference in degree rather than a difference in kind. Therefore, the *Klopfenstein* court properly focused the § 102(b) inquiry on the inventor's conduct, which is wholly consistent with the well-settled policy that "prior public disclosure of the substance of an invention serves as the most fundamental bar to the ability of an inventor to obtain patent protection."²⁰²

VI. CONCLUSION

Would-be infringers target university patents because faculty inventors are more likely to make inadvertent disclosures than are industrial inventors.²⁰³ As Professor Durham notes, the § 102(b) printed publication bar provides a straightforward challenge to patent validity "because it relies on the easily determined critical date of the patent application, rather than the often difficult to determine date of invention."²⁰⁴ In *Klopfenstein*, the Federal Circuit did not broaden the scope of a "printed publication," but instead emphasized that the public accessibility and dissemination inquiries will rest on substance rather than form. The focus of the § 102(b) inquiry remains on the inventor, who should lose the right to patent his invention if he makes a public disclosure. To the extent that tension exists between patenting and

ability to take notes at an oral presentation accompanied by slides and a presentation that is 'entirely oral.'" Ricks, *supra* note 15, at 867 n.129.

199. See discussion *supra* Part IV.A.

200. See cases cited *supra* notes 54, 56 (discussing the policy behind the § 102(b) statutory bar). See also *supra* Part III.A (same).

201. In other words, in terms of reasonableness, an inventor who uses visual aids, in the absence of protective measures, can reasonably expect the audience to copy or remember what they have seen. This expectation is less reasonable for a purely oral presentation.

202. Advisory Commission on Patent Law Reform, U.S. Dep't of Commerce, Report to the Secretary of Commerce 47 (1992).

203. "[The Federal Circuit's decision in *Klopfenstein*] doesn't surprise me, because in the drug industry there's no way that we would show a poster on *anything* before the patent application had been filed. We err on the side of caution." Web Log posting of Derek Lowe, *Keep It To Yourself*, to http://pipeline.corante.com/archives/patents_and_ip (Nov. 15, 2004) (discussing *Klopfenstein*).

204. DURHAM, *supra* note 58, at 118. See also 2 HORWITZ & HORWITZ, PATENT LITIGATION: PROCEDURE & TACTICS §§ 6.03, 605 (2006); *supra* text accompanying note 9.

publishing research, the tension can be resolved through incentives and managerial decision making, not through an amendment to the Patent Act to protect university inventors.²⁰⁵

205. In her Note criticizing *Klopfenstein*, Cindy Ricks argues that:

Congress should take action and redraft the statute to unambiguously return to the standard articulated in previous case law, under which copies of a reference must be either actually distributed to the public or else placed where the public has continued access to them, in order for the reference to constitute a printed publication.

Ricks, *supra* note 15, at 866 (citation omitted). Also, “the general confusion in the case law regarding the printed publication requirement suggests that Congress should redraft the statute to reflect modern technologies used for disseminating information.” *Id.*