IS NOVELTY OBSOLETE? CHRONICLING THE IRRELEVANCE OF THE INVENTION DATE IN U.S. PATENT LAW

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INTRODUCTION

In the canonical nineteenth-century case of *Pierson v. Post*, jurists considered the elements of possession necessary to allow a hunter to claim property rights in a wild fox.[1] The court sat divided on whether some rights should inure to the hunter based on his hot pursuit of the wild animal.[2] The dissent argued that such a rule would beneficially encourage fox hunting,[3] but the court ultimately ruled that property rights only come into being once the fox is in-hand.[4] Like the property regimes governing the capture of wild animals, patent law also awards first-in-time rights. But, instead of requiring evidence of physical possession, patent law grants rights to the first qualified inventor.[5] Jurisdictions differ, however, in the elements used to distinguish the first qualified inventor from others in the field.[6]

Most of the world employs a "first-to-file" system, which awards priority based solely on the timing of an applicant's patent application filing.[7] In a first-to-file system, when two or more enti-

1. *See* Pierson v. Post, 3 Cai. 175 (N.Y. Sup. Ct. 1805); Bethany Berger, *It's Not About the Fox: The Untold History of Pierson v. Post*, 55 DUKE L.J. 1089 (2006).

2. *See Pierson*, 3 Cai. 175.

3. *See id.* At the time the case was decided, fox hunting was encouraged and rewarded as a way of eliminating the troublesome animals. *See id.*

4. *See id.* (holding that a hunter first acquires a property interest in animals when he has "so wounded, circumvented or ensnared them, so as to deprive them of their natural liberty, and subject them to the control of their pursuer").

5. *See* Timothy R. Holbrook, *Possession in Patent Law*, 59 SMU L. REV. 123 (2006); Paul M. Schoenhard, *Reconceptualizing Inventive Conception: Strengthening, Not Abandoning the First-To-Invent System*, 17 Fed. Cir. B.J. 567, 606 (2007) ("[A]t various milestones, United States patent law recognizes rights against infringers, competing claimants, and the government.").

6. Patent rights are territorial in nature. Each country has its own patent laws and enforcement regimes. Some blocs of countries—such as the thirty-six signatories to the European Patent Convention (EPC)—cooperate in the administration of unitary patent examination systems. *See* Convention on the Grant of European Patents art. 54, Oct. 5, 1973, 1065 U.N.T.S. 255, 272 [hereinafter European Patent Convention] (entered into force on Oct. 7, 1977); *cf.* Jerome Reichman & Rochelle Cooper Dreyfuss, *Harmonization Without Consensus: Critical Reflections on Drafting a Substantive Patent Law Treaty*, 57 DUKE L.J. 85 (2007) (discussing the interaction between territorial laws and efforts toward harmonization).

7. *See* Toshiko Takenaka, *The Future of Patent Law: Rethinking the United States First-to-Invent Principle from a Comparative Law Perspective: A Proposal to Restructure*

ties separately pursue patent rights on the same invention, only the first entity to file for patent protection is awarded patent rights.

The conventional "first-to-file" identifier is something of a misnomer because the name focuses attention on the priority contest between competing applicants. In general, first-to-file systems exhibit a focus on the filing-date that extends beyond these priority contests to include statutory bar provisions that block the patenting of an invention that was publicly available at any time prior to the patent application filing date.[8] Some first-to-file countries provide an exception permitting an inventor's own pre-filing disclosure.[9]

§ 102 Novelty and Priority Provisions, 39 HOUS. L. REV. 621, 624 (2002) (discussing elements of a first-to-file system); European Patent Convention, *supra* note 6; Tokkyo Ho [Japanese Patent Law], Law No. 121 of 1959, arts. 29–30; Steve Seidenberg, *A Sea Change in Patent Law: Proposed Legislation Would Wean the United States from a 'First to Invent' Approval System*, 92 A.B.A. J. 49 (2006) ("The United States is the only nation in the world that follows the first-to-invent principle in awarding patents.").

8. Notably, the European Patent Office examination process does not offer any opportunity to assert rights based on a prior invention date except under the limited circumstances when a duty of confidentiality has been breached. *See* European Patent Convention, art. 54, ¶ 2, Oct. 5, 1973, http://www.epo.org/patents/law/legal-texts/html/epc/1973/e/ar54.html ("The state of the art shall be held to comprise everything made available to the public by means of a written or oral description, by use, or in any other way, before the date of filing of the European patent application."); *Id.*, art 55, ¶ 1(a), http://www.epo.org/patents/law/legal-texts/html/epc/1973/e/ar55.html ("[A] disclosure of the invention shall not be taken into consideration if it occurred no earlier than six months preceding the filing of the European patent application and if it was due to, or in consequence of . . . an evident abuse in relation to the applicant or his legal predecessor."); *see also* Joseph Straus, *Grace Period and the European and International Patent Law: Analysis of Key Legal and Socio-Economic Aspects*, *in* 20 IIC STUDIES: STUDIES IN INDUS. PROP. & COPYRIGHT L. 1, 3 (Gerhard Schricker ed., 2001); IPR HELPDESK, GRACE PERIOD AND INVENTION LAW IN EUROPE AND SELECTED STATES ¶ 6, http://www.iprhelpdesk.org/documents/GracePeriodinventionLaw_0000004514_00.xml.pdf (last visited Oct. 16, 2009).

9. Where it is available in Europe, the grace period is:

> understood as a specific period of time preceding the filing of a patent application, during which disclosures . . . of the invention for which the patent application is filed *by the inventor or his/her successor in title* do not constitute prior art in respect of the patent application at hand. [Such] disclosures do not establish a priority date, *i.e.* do not provide for immunity for the inventor/applicant against parallel or later independent disclosures, including patent applications of third parties.

Joseph Straus, EXPERT OPINION ON THE INTRODUCTION OF A GRACE PERIOD IN THE EUROPEAN PATENT LAW 48 (2000) (emphasis added), *available at* http://tiny.cc/Ew7mc; *see also* Kate H. Murashige, *Harmonization of Patent Laws*, 16 HOUS. J. INT'L L. 591, 610–11 (1994) (describing limited grace periods available under Japanese, Australian, and Canadian law); Toshiko Takenaka, *Rethinking the United States First-To-Invent Principle From a Comparative Law Perspective: A Proposal to Restructure § 102 Novelty and Priority Provisions*, 39 HOUS. L. REV. 621, 626–29, 663 (2002); JAPANESE GROUP OF AIPPI, A STUDY OF GRACE PERIOD AND OTHER CONDITIONS OF PATENTABILITY IN NATIONAL AND REGIONAL PATENT SYSTEMS 1 (Mar. 2000) (stating that 87% of 121 national and regional patent systems provide for some type of grace period.); William Lesser, *Grace Periods in First-to-File Countries*, 9 EUR. INTELL. PROP. REV. 81 (1987); IPR HELPDESK, GRACE PERIOD AND INVENTION LAW IN

However, that grace period is often severely limited in scope and duration.[10]

U.S. patent law stands apart from the rest of the world: it alone adheres to a "first-to-invent" system, which allows an inventor to assert first-inventor rights and claim priority back to the date when the invention was first conceived.[11] Thus, in a priority contest between competing inventors, the inventors' dates of conception and reduction-to-practice take precedence over their application filing dates.[12]

Like "first-to-file," the "first-to-invent" identifier is a misnomer because the name focuses attention on the priority contest between competing inventors. The U.S. first-to-invent systems exhibit a focus on the invention date extending beyond this head-to-head priority contest to include novelty provisions that allow an inventor to antedate putative prior art by reaching back to claim priority as of her date of conception, thus negating the patent-blocking effect of third-party technological advances disclosed in the interim between conception and patent application filing.[13]

Despite the invention-date-based focus of the U.S. patent system, two considerations greatly restrict an inventor's ability to claim priority back to the date of conception. First, high evidentiary requirements impede attempts to prove priority unless the inventor painstakingly and contemporaneously recorded the inventive process.[14] Second, the statutory bar established in 35 U.S.C. § 102(b) blocks the patenting of any invention publicly available or on sale more than one year before the patent application filing date, regardless of the date of conception.[15] The

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EUROPE AND SELECTED STATES ¶¶ 3–4, http://www.ipr-helpdesk.org/documents/GracePeriodinventionLaw_0000004514_00.xml.pdf (last visited Oct. 16, 2009) (describing grace periods in Portugal, Spain, Russia, China, Canada, Japan, and other countries).

10. *See supra* note 9.

11. 35 U.S.C. § 135 (2008) (providing the framework for an interference proceeding); 35 U.S.C. § 102(g) (2008) (providing the legal standard for judging priority between two inventors each claiming patent rights).

12. In the Unites States, a priority contest between competing patent applicants is known as an "interference proceeding." The administrative patent law judges sitting on the Board of Patent Appeals and Interferences (BPAI) conduct the interference proceeding as an *inter partes* trial. 35 U.S.C. § 135 (2008) (providing the framework for an interference proceeding). The priority contest can also occur in the context of litigation at the district court level. Hybritech, Inc. v. Monoclonal Antibodies, Inc., 802 F.2d 1367 (Fed. Cir. 1986).

13. *See id.* at 1380 (rejecting the prior art status of articles used in an obviousness rejection because those articles were published "well after the date of conception").

14. *See infra* notes 59 and 60.

15. 35 U.S.C. § 102(b) (2008) (a patent may not issue 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."); JANICE M. MUELLER, PATENT LAW 156 (3rd ed. 2009); Pfaff v. Wells Elects., Inc., 525 U.S. 55, 57 (1998).

ability to swear behind prior art, coupled with the statutory bar of § 102(b), creates a one-year grace period for filing in the United States.[16] Unlike the limited grace period available under first-to-file systems, the U.S. grace period is not restricted either to self-disclosures or necessarily in duration.[17]

Although I recognize that the terms "first-to-invent" and "first-to-file" are well-ingrained, I would shift the terminology to distinguish between systems that are filing-date-focused and those that are invention-date-focused.

For the past forty years, various patent reform proposals have called for the harmonization of the U.S. system with the rest of the world.[18] The Patent Reform Act of 2009 would eliminate the U.S. grace period except for disclosures by the patent applicant or subsequent to public disclosures by the patent applicant.[19] For years, academics and policy-makers have argued extensively over the potential benefits and harms of the

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Although rarely at issue, prior art disclosed in a prior foreign patent filing, as defined in § 102(d) of the Patent Act, takes precedence over the statutory novelty provisions, as does evidence that the purported inventor was not the actual inventor under § 102(f). *See* U.S. PATENT & TRADEMARK OFFICE ("USPTO"), MANUAL OF PATENT EXAMINING PROCEDURE § 715 (8th ed., rev. 7, July 2008) [hereinafter MPEP].

16. MUELLER, *supra* note 15, at 159 ("So long as the patent application is filed within one year of the first instance of the invention being released into the public domain or commercially exploited . . . either by the patent applicant or a third party, the right to a U.S. patent will not be lost under 35 U.S.C. § 102(b)."). This date one year prior to the effective filing date of a patent application is typically referred to as the "critical date." *Pfaff*, 525 U.S. at 57 ("On April 19, 1982, petitioner . . . filed an application for a patent. . . . Therefore, April 19, 1981, constitutes the critical date for purposes of the on-sale bar of 35 U.S.C. § 102(b); if the 1-year period began to run before that date, Pfaff lost his right to patent his invention."); *See also* Rebecca Eisenberg, *The Promise and Perils of Strategic Publications to Create Prior Art: A Response to Professor Parchomovsky*, 98 MICH. L. REV. 2358, 2359 (2000).

17. The grace period is not strictly limited to one year. For instance, an earlier-filed patent application that qualifies as novelty-defeating prior art only under § 102(e) of the Patent Act has an effective date that reaches all the way back to the application's filing at the USPTO. An inventor can, however, antedate § 102(e) prior art by proving an even earlier invention date, regardless of whether that timeline extends back more than one year. MPEP, *supra* note 15, at § 2136.05; 1 DONALD S. CHISUM, CHISUM ON PATENTS § 3.08 (Matthew Bender 2008) ("[A]n applicant may use a Rule 131 affidavit to avoid another applicant's prior domestic filing date, even though it is more than one year prior to the application date.").

18. *See, e.g.*, Patent Reform Act of 2009, S. 515 & H.R. 1260, 111th Cong. (2009); Patent Reform Act of 2007, S. 1145 & H.R. 1908, 110th Cong. (2007); Patent Reform Act of 2005, H.R. 2795, 109th Cong. (2005); United States Patent and Trademark Organization Act of 1997, H.R. 400, 105th Cong. (1998); Patent System Harmonization Act of 1992, H.R. 4978, 102d Cong. (1992); Patent Reform Act of 1967 S. 1691 & H.R. 5924, 90th Cong. (1967). *See generally* Donald W. Banner, *Patent Law Harmonization,* 1 U. BALT. INTELL. PROP. L.J. 9 (1992); George E. Frost, *The 1967 Patent Law Debate: First-to-Invent vs. First-to-File*, 1967 DUKE L.J. 923 (1967), *available at* http://www.jstor.org/stable/1371351; Charles L. Gholz, *First-to-File or First-to-Invent?*, 82 J. PAT. & TRADEMARK SOC'Y 891 (2000); Michael Martin, *The End of the First-to-Invent Rule: A Concise History of its Origin*, 49 IDEA 435 (2009).

19. *See* S. 515, § 2, & H.R. 1260, § 3.

proposed changes.[20] However, like the dissenting opinion in *Pierson v. Post*,[21] the arguments raised on both sides typically lack meaningful empirical support.[22] Most notably, the first-to-file patent reform debate has not produced any empirical data apart from analyses of the results of the rare interference proceedings between competing inventors.[23] Missing is any evidence of the importance of an applicant's ability to antedate would-be prior art during ordinary *ex parte* patent prosecution.[24] The

20. *See, e.g.*, *Perspective on Patents: Harmonization and Other Matters Hearing Before the Subcomm. on Intellectual Property of the S. Comm. on the Judiciary*, 109th Cong. 4 (2005) (statement of Gerald Mossinghoff, Former Comm'r of Patents and Trademarks); Margo Bagley, *Academic Discourse and Proprietary Rights: Putting Patents in Their Proper Place*, 47 B.C. L. REV. 217 (2006); Margo Bagley, *The Need for Speed (and Grace): Issues in a First-Inventor-to-File World*, 23 BERKELEY TECH. L.J. 1035 (2008); Mark Lemley & Colleen Chien, *Are the U.S. Patent Priority Rules Really Necessary?*, 54 HASTINGS L.J. 1299 (2003); Ryan K. Dickey, *The First-to-Invent Patent Priority System: An Embarrassment to the International Community*, 24 B.U. INT'L L.J. 283 (2006); Stephanie Gore, *Eureka! But I Filed Too Late . . . : The Harm/Benefit Dichotomy of a First-to-File Patent System*, 1993 U. CHI. L. SCH. ROUNDTABLE 293 (1993); Peter A. Jackman, *Adoption of a First-to-File Patent System: A Proposal*, 26 U. BALT. L. REV. 67 (1997); Rebecca C.E. McFadyen, *The "First-to-File" Patent System: Why Adoption Is NOT an Option!*, 14 RICHMOND J.L. & TECH. 3 (2007), *available at* http://law.richmond.edu/jolt/v14i1/article3.pdf; Brad Pedersen & Vadim Braginsky, *The Rush to a First-to-File Patent System in the United States: Is a Globally Standardized Patent Reward System Really Beneficial to Patent Quality and Administrative Efficiency?*, 7 MINN. J.L. SCI. & TECH. 757 (2006); Anthony D. Sabatelli & J.C. Rasser, *Impediments to Global Patent Law Harmonization*, 22 N. KY. L. REV. 579 (1995); Kim Taylor, *Patent Harmonization Treaty Negotiations on Hold: The "First To File" Debate Continues*, 20 J. CONTEMP. L. 521 (1994); Whitney E. Fraser Tiedemann, *First-to-File: Promoting the Goals of the United States Patent System as Demonstrated Through the Biotechnology Industry*, 41 U.S.F. L. REV. 477 (2007); Donald R. Dunner, *First-To-File: Should Our Interference System Be Abolished?*, 68 J. PAT. & TRADEMARK OFF. SOC'Y, 561 (1986); R. CARL MOY, MOY'S WALKER ON PATENTS § 8:36 (4th ed. 2009)(collecting sources on system advantages and disadvantages).

21. *See* 3 Cai. 175 (N.Y. Sup. Ct. 1805) (Livingston, J., dissenting) (arguing that a rule awarding rights based on pursuit would create a better incentive to hunting the "wild and noxious beast").

22. Shih-Tse Lo & Dhanoos Sutthiphisal, *Does it Matter Who Has the Right to Patent: First-to-Invent or First-to-File? Lessons from Canada* (Nat'l Bureau of Econ. Research, Working Paper No. w14926, April 2009), *available at* http://ssrn.com/abstract=1394833 ("Unfortunately, no empirical work is available to substantiate these claimed benefits and costs of the two doctrines, which would help us understand how the Reform, if passed and signed into law, will affect U.S. inventive activity.").

23. To be clear, several empirical articles have focused on the impact of the change on priority contests. Lemley & Chien, *supra* note 20; Gerald J. Mossinghoff, *The U.S. First-to-Invent System Has Provided No Advantage to Small Entities*, 84 J. PAT. & TRADEMARK OFF. SOC'Y. 425, 427 (2002) (stating that between 1983 and 2000, the first-to-file won 1917 of the 2858 interference cases). *But see* Charles L. Gholz, *A Critique of Recent Opinions in Patent Interferences*, 84 J. PAT. & TRADEMARK OFF. SOC'Y. 163, 181 (2002) (reporting that USPTO data suggests that the first-to-file has recently been winning in only 52.5% of the cases); Dunner, *supra* note 20, at 561.

24. In the ordinary course of patent prosecution, a patent applicant may antedate prior art by filing an affidavit or declaration to establish prior invention under 37 C.F.R. § 1.131. This process is also known as "swearing behind" a prior art reference. I find that interferences

only published statistic regarding the prevalence of such prior-invention assertions appears as an un-sourced estimate in a 1988 student note.[25]

This paper presents a normative study of patent prosecution by examining the role that invention-date-based novelty rights play in U.S. patent law. Three sources inform the primary results: the prosecution history files of 21,000+ patent applications filed in the past decade; a survey of 1,000+ patent practitioners regarding their use of the novelty provisions of the Patent Act; and a collection of 11,000,000+ prior art references cited in recently-issued patents. Additional compilations of prosecution file histories for patents identified as either (1) valuable or (2) worthless supplement these data sets and allow for an evaluation of the differential importance of the novelty rights. Finally, a set of opinions from the Board of Patent Appeals and Interferences (BPAI) evidences the difficulty of proving a prior invention date.

SUMMARY OF THE RESULTS: During prosecution, most patent applicants contend with non-102(b) prior art that could be antedated. Yet, very few applicants actually attempt to assert prior-invention rights. A miniscule 0.1% of cases in my large cohort sample included an assertion of novelty rights that directly led to an issued patent.[26] Claiming priority to a pre-filing invention date requires that an applicant prove prior conception and due diligence or reduction-to-practice. The difficulty of attempting to prove these elements are laid-out in a set of administrative patent appeal decisions where 77% of attempts to antedate references were rejected by the administrative court.

Given the difficulty of asserting invention-date-based novelty rights, it is unsurprising that applicants are more likely to assert such rights in

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are about forty-times rarer than attempts to assert invention-date novelty rights in *ex parte* cases. *See infra* pt. II.G.

25. Charles Macedo, Note, *First-to-File: Is American Adoption of the International Standard in Patent Law Worth the Price?*, 1988 COLUM. BUS. L. REV. 543, 580 (1988) ("The Patent Office estimates that such section 131 affidavits are filed in three to five percent of the patent applications."). I contacted Mr. Macedo—now a prominent patent litigator and author—but the original source of the estimate for rule 131 usage appears lost to the ages (personal correspondence on file with author). Acting USPTO Director Jon Doll indicated to me that the USPTO does not track this specific measure (personal correspondence on file with author). A clearly incorrect German report suggests that the U.S. grace period was utilized in approximately "every fifth patent application" throughout the 1990s. GERMAN FEDERAL MINISTRY FOR EDUCATION AND RESEARCH, THE INTRODUCTION OF A GRACE PERIOD IN PATENT LAW—A US-GERMANY COMPARISON BASED ON HIGHER EDUCATION 3 (2002), *available at* http://www.bmbf.de/pub/neuheitsschonfrist_im_patentrecht.pdf. *See also* Edward Walterscheid, *Rule 131 Practice*, 57 J. PAT. OFF. SOC'Y 336 (1975)("Even a cursory review of the published cases reveals the great reliance of applicants on Rule 131 practice.").

26. Taking this result one step further, I also found the assertion of invention-date novelty was unnecessary for patentability in at least some of these twenty cases. Notably, several of these inventions were also patented in Europe under a regime where priority rights cannot reach back beyond the filing date.

cases of highly valuable inventions, choosing not to waste money in less valuable cases. Furthermore, and perhaps contrary to conventional wisdom, my findings suggest that individual inventors assert invention-date-based novelty rights relatively less often and less successfully than large, publicly traded companies. Lastly, a practitioner survey of 1000+ patent law professionals reveals, *inter alia*, a shared concern that attempts to antedate prior art leave patents open to challenge during litigation by providing "fodder" for validity challenges.

OUTLINE: Part I introduces the longstanding debate over the proposed switch from a patent system keyed by invention date to one driven solely by application filing date. Part II presents empirical evidence on the assertion of invention-date-based rights during the *ex parte* patent prosecution process. This analysis introduces and integrates six newly-developed sets of data, each focusing on a different aspect of invention-date-based novelty rights outside of the interference priority contest context. In particular, Part II.A analyzes the frequency of attempts to antedate prior art references based on a study of the file histories of 21,000+ utility patent applications filed between 2000 and 2007. Part II.B considers and rejects the idea that the strength of the one-year statutory bar deters attempts to antedate. Part II.C considers provisional patent applications and their role as a partial substitute for asserting invention-date-based rights. Part II.D reports on the use of invention-date-based novelty rights during the prosecution of patents recognized as carrying high value. Specifically, for this portion, I consider (1) patents involved in litigation and (2) patents listed with the FDA as covering approved therapeutic drugs. To compare these results, I also report on the use of invention-date-based novelty rights during the prosecution of patents identified as worthless. Part II.E conveys the results of a survey of 1000+ U.S. attorneys and patent agents regarding, *inter alia*, their reliance on novelty rights during patent prosecution. Part II.F reports the results of a study of recent BPAI decisions determining the success *vel non* of attempts on appeal to antedate prior art based on prior invention date. Part II.G presents evidence on the prevalence of the assertion of first-inventor rights in interference proceedings. Finally, Part III concludes by integrating these separate empirical studies and suggests that policy-makers consider reform measures calibrated to garner the benefits of a first-to-file system while lessening its impact.

I have hesitated in writing this article because of my own affinity for rights that derive primarily from invention rather than formal filing.[27]

27. *See* Dennis Crouch, *Patent Reform and the Ethos of the American Inventor*, Patently-O, http://www.patentlyo.com/patent/2008/01/patent-reform-a.html (Jan 17, 2008, 11:10 EST).

Any changes to the U.S. patent system should protect the legitimate hope that new entrants can still win the patenting game.

I. KEYING RIGHTS TO THE EFFECTIVE FILING DATE: AN INTRODUCTION TO THE DEBATE

In this section, I introduce the general policy debate between systems that are filing-date-focused and those that are invention-date-focused. A primary argument against an invention date focus is its lack of clarity.[28] Although the novelty provisions of U.S. patent law focus on the invention date, U.S. patent applicants need not actually disclose their dates of invention, conception, or reduction to practice.[29] In fact, invention dates are often kept secret, even during the process of claiming rights based on a prior invention date. The motivation for this allowance for ongoing secrecy makes some sense considering that the U.S. Patent and Trademark Office ("USPTO") and the patent applicants are the only parties directly involved in the prosecution process. In the course of its business, the USPTO does not concern itself with information regarding the invention date. Rather, absent contrary evidence, patent examiners simply presume the invention date is identical to the filing date.[30] While the USPTO is simply indifferent to whether the applicant discloses an invention date, a patent applicant—the only "party" in ordinary *ex parte* patent prosecution—will prefer to keep the invention date secret from

28. *See* Gretchen Ann Bender, *Uncertainty and Unpredictability in Patent Litigation: The Time Is Ripe for a Consistent Claim Construction Methodology*, 8 J. INTELL. PROP. L. 175, 210–211 (2001); John R. Thomas, *Patent System Reform: The Responsibility of the Rule-maker: Comparative Approaches to Patent Administration Reform*, 17 BERKELEY TECH. L.J. 727, 749 (2002); Thomas Chen, Note, *Patent Claim Construction: An Appeal for Chevron Deference*, 94 VA. L. REV. 1165, 1177 (2008) ("Patent claims are often intentionally drafted with vague and ambiguous language, in order to preserve sufficient maneuverability for future litigation."). The unknown invention date creates a potential "fuzzy-property" problem similar to that described by James Bessen and Michael J. Meurer in their influential book. PATENT FAILURE: HOW JUDGES, BUREAUCRATS, AND LAWYERS PUT INNOVATORS AT RISK 46 (2008) ("[I]ncreasingly, patents fail to provide *clear notice* of the scope of patent rights. Thus, innovators find it increasingly difficult to determine whether a technology will infringe upon anyone's patents, giving rise to inadvertent infringement. Similarly, they find it increasingly costly to find and negotiate the necessary patent licenses in advance of their technology development and adoption decisions. Thus, clearance procedures that work well for tangible property are undercut by a profusion of fuzzy patent rights.").

29. Martin J. Adelman et al., *Cases and Materials on Patent Law* 320 (1998) (noting the ad hoc nature of the disclosure of dates of conception, reduction to practice, and diligence through Rule 131); MUELLER, *supra* note 15, at 189.

30. In this sense, the U.S. system could be described as having a filing-date-focused default rule that may be set aside when an applicant provides sufficient evidence. *See* Griffith v. Kanamaru, 816 F.2d 624, 626 (Fed. Cir. 1987) (stating the default rule); *See also* Cass R. Sunstein, *Switching the Default Rule*, 77 N.Y.U. L. REV. 106 (2002) (generally explaining the power of default rules).

third parties who may later attempt to invalidate the patent. As a responder to my practitioner survey indicated, a patent can be more valuable if opponents do not have "a known target date."[31] Furthermore, in many cases, the inventors themselves cannot pinpoint their legally cognizable invention date.[32]

Patent law would remain complicated even if U.S. patent rights were keyed to the effective filing date, but the simple temporal demarcation would facilitate the determination by all concerned parties of whether a given activity constitutes prior art. Such newfound clarity would begin at the point of filing and continue throughout the life of the patent.[33] The direct cost of achieving this simplicity is borne by the patent applicant because the filing-date-focused rules cleanly sever the patent applicant's potential rights to antedate prior art references. Indirectly, this switch may diminish future incentives to innovate and disclose innovation through the patent system. In the simplest of models, the filing-date focus would drive some potential applicants to file for protection even earlier[34] and compel others to simply drop out of the patent race.[35] Supporters of invention-date-based patent rights argue that the switch would lead to a rushed patent application process, a higher number of low quality applications, and a procedure that favors large corporations at the expense of individual inventors and emerging companies.[36]

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31. Response 804324590 to Dennis Crouch, Survey: Swearing Behind Prior Art ("Survey"), *infra* app. 3. *See infra* pt. II.E.1 for detailed survey information.

32. The determination of an invention date requires a sometimes difficult process of sufficiently proving the timing of either the reduction to practice of the invention as claimed or the conception of the invention followed by due diligence. *See infra* pt. II (reviewing the legal rules and process of antedating).

33. Even if the invention-date based novelty and priority provisions were eliminated, invention dates would likely continue to be important for resolving disputes over inventorship. *See* Univ. of Pittsburgh v. Hendrick, 573 F.3d 1290, 1297 (Fed. Cir. 2009) (rejecting co-inventorship claim).

34. *See* Christopher A. Cotropia, *The Folly of Early Filing in Patent Law*, 61 HASTINGS L.J. 65 (2009) (questioning the wisdom of encouraging early filing); Suzanne Scotchmer & Jerry Green, *Novelty and Disclosure in Patent Law*, 21 RAND J. ECON. 131, 131–146 (1990). The elimination of invention-date-based patent rights invariably shifts focus to filing and away from inventing; as a consequence, the patent system tends to "dilute the incentive to carry out R&D and may lower the overall level of inventive activity." Lo & Sutthiphisal, *supra* note 22, at 4.

35. *See* Lo & Sutthiphisal, *supra* note 22, at 5–6 ("We find that the 1987 Canadian Patent Reforms [sic] did not change R&D efforts by Canadian inventors. However, the Reforms seemed to have a small negative impact on patenting of Canadian domestic-oriented industries in Canada, the U.S. or Europe[. The reforms also] skewed the ownership of patented inventions towards large corporations. These findings suggest that a switch from first-to-invent to first-to-file may harm a country's inventive activity."). Lo and Sutthiphisal focus only on changes in the priority contest rules and do not consider the impact of altered novelty provisions.

36. *See* F. Scott Kieff, *The Case for Registering Patents and the Law and Economics of Present Patent-Obtaining Rules*, 45 B.C. L. REV. 55, 96 (2003) ("As recognized by the com-

The U.S. novelty provisions and accompanying grace period, long-regarded as important policy tools, offer inventors leeway to continue developing an invention and determine its potential commercial value.[37] The grace period is seen as particularly important to independent inventors, who often need to disclose their inventions to the public in order to assess the commercial potential and then procure financing for patent prosecution.[38] Moreover, the one-year grace period provides important flexibility to university researchers, many of whom become entrepreneurs by commercializing research initiated in an academic setting.[39]

This debate is not occurring in a vacuum. On the contrary, most countries have already chosen to base patent priority rights exclusively on the filing date.[40] Potential value exists in a unifying rule that creates efficiencies in processing international patent applications.[41]

Much of the debate has focused on priority contests. On this topic, supporters of invention-date-based rights call upon natural law[42]—suggesting that the more deserving party is the first inventor—and U.S. Constitutional principles.[43] The infrequency of interference proceedings,

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mercialization theory, a shift to a first-to-file system may lead to an increased likelihood that neither party in a priority dispute will remain with a valid patent because the increased incentive to file early that may operate to make one party a winner on priority might also have caused that party to file an application with inadequate disclosure.").

37. Baxter Int'l, Inc. v. COBE Labs., Inc., 88 F.3d 1054, 1058 (Fed. Cir. 1996) (noting that the policies underlying § 102(b) include "allowing the inventor a reasonable amount of time following sales activity to determine the potential economic value of a patent" (citing Tone Bros., Inc. v. Sysco Corp., 28 F.3d 1192, 1198 (Fed. Cir. 1994)); Bagley, *The Need for Speed (and Grace)*, *supra* note 20, at 1051 (discussing importance of the grace period); James R. Barney, Note, *An Overview of the Pros and Cons of Provisional Patent Applications*, 1 YALE SYMP. L. & TECH. 2, 4 (1999) ("The one-year grace period of § 102(b) is a very important element of the U.S. patent system.").

38. Bagley, *The Need for Speed (and Grace)*, *supra* note 20, at 1037.

39. *Id.* at 1051.

40. *See* sources, *supra* note 7.

41. Patent System Harmonization Act of 1992, H.R. 4978, 102d Cong. (1992); Hearing on S. 2605 and H.R. 4978 Before the S. Judiciary Subcomm. on Patents, Copyrights and Trademarks and the H. Judiciary Subcomm. on Courts, Intellectual Property and the Administration of Justice, 102d Cong. 65 (1992) (statement of Professor Robert Merges, School of Law, Boston University); Scott Erickson, *Patent Law and New Product Development: Does Priority Claim Basis Make a Difference?*, 36 AM. BUS. L.J. 327, 327 (1999); Gholz, *supra* note 18, at 893 ("[I]t would be good for the world market and for industrialized civilization as a whole if the United States would change its archaic first-to- invent system, which is undoubtedly the most significant idiosyncratic aspect of American patent law, to a first-to-file system."); Blake R. Wiggs, *Canada's First-To-File Experience—Should the U.S. Make the Move?*, 73 J. PAT. & TRADEMARK OFF. SOC'Y, 493, 504 (1991); Lo & Sutthiphisal, *supra* note 22.

42. *See* Wendy Lim, *Towards Developing a Natural Law Jurisprudence in the U.S. Patent System*, 19 SANTA CLARA COMPUTER & HIGH TECH. L.J. 559 (2003) (suggesting that an invention-date focus is grounded in a "natural law principle").

43. *See* Edwin A. Suominen, *Re-Discovering Article 1, Section 8—The Formula for First-to-Invent*, 83 J. PAT. & TRADEMARK OFF. SOC'Y 641 (2001); Michael F. Martin, *The End*

long-cited in support of a move to a first-to-file system, evidences the minute harm such a change would cause.[44] Indeed, over 99.9% of patent applications present no dispute as to the identity of the first inventor.[45]

It is certainly possible to decouple the priority regimes. Under one approach, patent races would focus solely on the filing date while applicants would retain the ability to antedate non-competing prior art based on invention date. A more narrowed approach would limit the use of pre-filing invention date evidence to overcoming prior art stemming from pre-filing disclosures by the inventors themselves.[46] Under an alternative approach, priority contests between competing inventors would focus on the respective invention dates while other priority issues would rely only on the filing date. The practical weight given to the invention date could also be adjusted by shifting the evidentiary requirements for proving pre-filing priority.

II. USE OF INVENTION-DATE-BASED NOVELTY RIGHTS DURING EX PARTE PATENT PROSECUTION

The primary goal of this portion of the study is to answer several questions: How frequently do patent applicants assert invention-date-based novelty rights in *ex parte* patent prosecution? When those rights are asserted, are applicants successful in proving an early invention date? And, does the U.S.-style novelty system favor certain groups, such as independent inventors or universities?

Before presenting the study and its results, I discuss the novelty provisions of U.S. patent law and the process of antedating prior art during patent prosecution.

NOVELTY RIGHTS & STATUTORY BARS: The core of patent examination involves a comparison of the claimed invention against the prior art in order to determine whether the invention is sufficiently new. The overlapping anticipation provisions of 35 U.S.C. § 102(a),(b),(e), and (g)

of the First-to-Invent Rule: A Concise History of Its Origin, 49 IDEA 435 (2009) (suggesting that the dual sovereignty of state and federal governments led to the first-to-invent system).

44. *See supra* note 23.

45. *See* ADVISORY COMM'N ON PATENT LAW REFORM, A REPORT TO THE SECRETARY OF COMMERCE 44 (1992) ("More than 99.9% of the U.S. patent applications now being filed raise no dispute as to the identity of the first inventor."); *see also* Vito J. DeBari, Note, *International Harmonization of Patent Law: A Proposed Solution to the United States' First-to-File Debate*, 16 FORDHAM INT'L L.J. 687, 707 (1993).

46. This is the most common approach worldwide and is followed by Canada, Japan, and now China. Lesser, *supra* note 9, at ¶¶ 3–4. It is also similar to the proposals found in the Patent Reform Act of 2009, S. 515 & H.R. 1260, 111th Cong. (2009).

substantially define the scope of the prior art.[47] These subsections may be categorized as either novelty provisions or statutory bar provisions. The novelty provisions of § 102(a), (e), and (g) identify prior art with reference to the invention date. The statutory bar or "loss of rights" provision § 102(b) focuses on activity that occurred more than one year before the patent application filing date.[48]

Subsection 102(a) describes the common forms of publicly available prior art, that is, all the references theoretically accessible to an inventor at the time of the invention.[49] This includes material that is "known or used by others," "patented," or "described in a printed publication" before the applicant's invention date.[50] Subsections 102(e) and (g) both identify forms of potentially "secret prior art." Subsection 102(e) focuses on prior patent applications that disclose (but do not claim) inventions. If such an application is later published, the application will constitute § 102(e)(1) prior art as of its filing date.[51] If such an application is later issued as a patent, the application will constitute § 102(e)(2) prior art as of its filing date. The policy rationale behind § 102(e) is that, if another applicant's earlier-filed application describes the applicant's claimed invention, the applicant was not the first inventor: "The fact that the knowledge was not publicly known is outweighed by the USPTO's knowledge of the invention and its unique role in making patent determinations."[52]

Subsection 102(g) focuses on competing claims for priority of inventorship as follows:

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47. Furthermore, § 102(b) has been interpreted to bar the patenting of an otherwise patentable process based on secret commercial uses of the process by the applicant. *See* Metallizing Eng'g Co. v. Kenyor Bearing & Auto Parts Co., 152 F.2d 516 (2d Cir. 1946); *see also* Kinzenbaw v. Deere & Co., 741 F.2d 383, 390–91 (Fed. Cir. 1984). *But see* W.L. Gore & Assocs., Inc. v. Garlock, Inc., 721 F.2d 1540, 1550 (Fed. Cir. 1983) (holding that secret use by third party does not trigger statutory bar).

48. Three other subsections of § 102 contain statutory bar provisions, but these subsections focus on the applicant's own behavior rather than intervening prior art. Specifically, § 102(c) requires that the applicant not "abandon" the invention; § 102(d) prevents a foreign applicant from unduly extending the patent term by first obtaining a patent abroad, then later seeking U.S. patent protection; and § 102(f) denies approval to an applicant if "he did not himself invent the subject matter sought to be patented." These provisions are infrequently utilized during the patent prosecution process. MUELLER, *supra* note 15, at 172 (explaining that the invalidation of patents under §§ 102(c) and 102(d) "is today a relatively rare event").

49. *See infra* pt. II.B (analyzing the prevalence of various forms of prior art based on a patent citation analysis).

50. 35 U.S.C. § 102(a) (2008) (making certain distinctions between prior art originating in the United States and in a foreign country).

51. *See Ex parte* Yamaguchi, 88 U.S.P.Q.2d 1606, 1609 (B.P.A.I. 2008) ("[A] provisional application can therefore be reasonably considered an 'application for patent' within the meaning of § 102 (e).").

52. PETER S. MENELL ET AL., PATENT CASE MANAGEMENT JUDICIAL GUIDE 11–43 (2009), *available at* http://ssrn.com/abstract=1328659.

> (1) The first to reduce the invention to practice has priority by default.
>
> (2) Filing a valid patent application is a constructive reduction to practice.
>
> (3) The second person to reduce to practice can prevail only if they were the first to conceive and were diligent from a time prior to the other inventor's conception through to their own reduction to practice.
>
> (4) Any reduction to practice that was abandoned, suppressed, or concealed cannot defeat patentability by another.[53]

Although § 102(g) rarely surfaces during *ex parte* patent prosecution, the statutory subsection defines the critical requirements for an applicant to prove an earlier invention date under § 102(a) or (e).[54]

The statutory bar provisions of § 102(b) arise when the invention is "in public use," "on sale," "patented," or "described in a printed publication" more than one year prior to the effective filing date of the patent application.[55] Once accessible to the public for more than one year, the statutory bar provisions block the inventor from obtaining patent rights on the invention. These provisions are supported by a strong policy "against removing inventions from the public [that] the public has justifiably come to believe are freely available to all as a consequence of prolonged sales activity."[56]

ANTEDATING OF PRIOR ART: The USPTO does not typically keep a record of an applicant's date of invention. Rather, when applying the novelty provisions, patent examiners presume that the filing date of the application is the invention date. Thus, the applicant must take affirmative steps to assert invention-date-based rights under the novelty provisions of the Patent Act.

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53. *Id.* at 11–42 (analyzing subsection 102(g)).

54. In my analysis of the 5313 *ex parte* BPAI cases disposed of in 2008, only three (<0.1%) decided a § 102(g) issue. Subsection 102(g) is rarely raised during *ex parte* prosecution because it demands more information than is ordinarily within the grasp of the patent examiner. In particular, the statutory subsection calls for a comparison of dates of conception and reduction-to-practice as well as a consideration of diligence. Such information is not typically available except in the unusual case where an examiner has first-hand knowledge about the prior art.

55. 35 U.S.C. § 102(b) (2008) (making certain distinctions between prior art originating in the United States and in a foreign country).

56. Gen. Elec. Co. v. United States, 654 F.2d 55, 61 (Ct. Cl. 1981).

The rules governing patent practice include specific guidelines for asserting invention-date-based rights during *ex parte* prosecution.[57] Under 37 C.F.R. § 1.131, the patent applicant may submit an "oath or affidavit to establish invention of the subject matter of the rejected claim prior to the effective date of the reference or activity on which the rejection is based." These submissions have become known as Rule 131 affidavits and typically require the applicant to show "completion of the invention" before the effective date of the cited reference.[58] Because the Rule 131 submission often takes the form of a sworn affidavit, this process has become commonly known as "swearing behind" or "swearing back" of a reference.[59]

Rule 131 explicitly requires that applicants provide evidence of prior invention that tracks the elements of § 102(g). Namely, the applicant must establish either (1) reduction-to-practice of the invention prior to the effective date of the reference being sworn behind, or (2) conception of the invention coupled with diligent efforts in developing the invention from before the effective date of the reference until reduction-to-practice.[60] "Original exhibits of drawings or records, or photocopies thereof, must accompany and form part of the affidavit or declaration or their absence must be satisfactorily explained."[61]

57. *See generally* Lisa A. Dolak, *Patents Without Paper: Proving a Date of Invention With Electronic Evidence*, 36 HOUS. L. REV. 471 (1999); Charles L. Gholz, *Practicing Under the New Patent Interference Rules and New Rule 131*, 77 J. PAT & TRADEMARK OFF. SOC'Y 858, 863 (1995); Edward C. Walterscheid, *Rule 131 Practice*, 57 J. PAT. OFF. SOC'Y 336 (1975); Henry Hope, Note, *Rule 131 Affidavits in Patent Law and Practice: Transformation from Rule to Reason*, 34 GEO. WASH. L. REV. 507 (1966).

58. *See In re* Stempel, 241 F.2d 755, 759 (C.C.P.A. 1957) (requiring an affidavit to show the completion of as much of the invention as is disclosed in the prior art reference).

59. *See* MPEP, *supra* note 15, at § 201.11. The Rule 131 process is also referred to as "antedating."

60. 37 C.F.R. § 1.131(b) (2008). *See* Cooper v. Goldfarb, 154 F.3d 1321, 1327 (Fed. Cir. 1998) (recognizing "actual reduction-to-practice" when the inventor proves: "(1) he constructed an embodiment or performed a process that met all the limitations of the interference count; and (2) he determined that the invention would work for its intended purpose"); *In re* Asahi/America, Inc., 68 F.3d 442, 447 (Fed. Cir. 1995) (stating that mere construction can constitute reduction-to-practice of a sufficiently simple device); Newkirk v. Lulejian, 825 F.2d 1581, 1583 (Fed. Cir. 1987) (finding that actual reduction-to-practice requires that the apparatus actually existed and worked, not merely that the apparatus was theoretically feasible). For the level of evidence necessary to demonstrate actual reduction-to-practice, *see* Ethicon, Inc. v. U.S. Surgical Corp., 135 F.3d 1456, 1461 (Fed. Cir. 1998) (asserting that an inventor's statements regarding the invention must be corroborated by independent evidence); Price v. Symsek, 988 F.2d 1187, 1195 (Fed. Cir. 1993) (declaring that the sufficiency of corroboration is determined through a "rule of reason" analysis, under which all pertinent evidence is examined to determine the credibility of an inventor's testimony).

61. 37 C.F.R. § 1.131(b) (2008); MPEP, *supra* note 15, at § 715 (providing examiner guidance on application of the rule including form paragraphs for rejecting affidavits based on lack of evidence); *see In re* Borkowski, 505 F.2d 713, 716 (C.C.P.A. 1974) (criticizing the quality of submitted affidavits).

In addition to the requirement of evidence of prior invention, a patent applicant's ability to antedate prior art references based on invention date faces other substantive limitations. Most notably, an applicant cannot swear behind prior art that is made available under a statutory bar.[62] Second, an applicant cannot antedate a reference in an *ex parte* proceeding if the reference is a patent or patent application that claims rights to the same invention.[63] Rather, in that case, the USPTO may declare an interference.[64] Or, if the purported prior art also belongs to the applicant, the examiner may issue a double-patenting rejection.[65] Third, the USPTO will not allow an applicant to swear behind material "clearly admitted on the record" as prior art.[66] Finally, if the applicant's effective filing date is prior to the effective date of the reference then it would not be necessary to prove an invention date because the priority of filing will suffice.[67]

In 1995, the USPTO amended Rule 131 to allow applicants to prove the dates of inventions that occurred outside the United States in either North American Free Trade Agreement ("NAFTA") or World Trade Organization ("WTO") member countries—a group encompassing over 150 potential countries of origin.[68] The amendment tracked congressional

62. *Ex parte* Zaromb, Appeal No. 1996-1556, 1999 WL 33291391 (B.P.A.I. Dec. 9, 1999) (holding that the applicant could not use a 131 declaration to swear behind a 102(b) reference). The only two types of references that can be antedated using a Rule 131 affidavit are those available under § 102(a) or (e). MPEP, *supra* note 15, at § 715.

63. MPEP, *supra* note 15, at § 715.05.

64. *See In re* Bass, 474 F.2d 1276, 1352 (C.C.P.A. 1973).

65. *Ex parte* Karn, Appeal No. 1998-1664, 2002 WL 87933 (B.P.A.I. 2002) (holding that an obviousness-type double-patenting rejection precludes the use of a Rule 131 affidavit to antedate the reference). The bar on double patenting is a "prohibition against the issuance of more than one U.S. patent on a particular claimed invention" to the same applicant. MUELLER, *supra* note 15, at 563. However, an applicant may skirt a double-patenting rejection when she owns both the reference patent and the application, and the two patent claims are not identical:

> Where the reference patent and the application or patent under reexamination are commonly owned, and the inventions defined by the claims in the application or patent under reexamination and by the claims in the patent are not identical but are not patentably distinct, a terminal disclaimer and an affidavit or declaration under 37 CFR 1.130 may be used to overcome a rejection under 35 U.S.C. § 103.

MPEP, *supra* note 15, at § 715; *see also* 35 U.S.C. § 103(c) (2008); MPEP, *supra* note 15, at § 718.

66. MPEP, *supra* note 15, at § 715 (citing *In re* Hellsund, 474 F.2d 1307 (C.C.P.A. 1973); *In re* Garfinkel, 437 F.2d 1000 (C.C.P.A. 1971); *In re* Blout, 333 F.2d 928 (C.C.P.A. 1964); *In re* Lopresti, 333 F.2d 932 (C.C.P.A. 1964)).

67. *Id.* ("Where the effective filing date of applicant's or patent owner's parent application or an International Convention proved filing date is prior to the effective date of the reference, an affidavit or declaration under 37 CFR 1.131 is unnecessary because the reference should not have been used. See MPEP § 201.11 to § 201.15.").

68. 60 Fed. Reg. 21,043 (May 1, 1995). Prior to this change, Rule 131 was "limited to facts showing a completion of the invention in the United States." *Id.*

changes brought about in the NAFTA Implementation Act of 1993, and the Uruguay Round Agreements Act of 1994.[69]

Although the scope of prior art is defined by the anticipation provisions of 35 U.S.C. § 102, many—if not most—prior art rejections occur in the context of obviousness.[70] The rhetoric of races and priority contests truly breaks down in these obviousness cases. Rather, attempts to antedate simply focus on swearing behind references that teach some element or elements of a larger invention. Thus, unlike § 102(g) priority contests, the antedating process is not necessarily directly competitive because swearing behind a reference is not an automatic challenge to the patentability of that reference.

For patent applicants, the invention date rules are both a blessing and a curse. Even when antedating is successfully used to overcome a USPTO rejection, the resulting patent may still be vulnerable to attacks during litigation if an opposing party can show an earlier effective date based on the invention date of the prior art reference or that the reference had a prior publication date.[71] In addition, antedating still leaves open a legal avenue for an opposing party to prove its own prior invention under § 102(g).

A. *A Study of the Prevalence of Invention-Date-Based Novelty Assertions in Patent Prosecution Based on the File Histories of 21,000+ Patent Applications*

1. The Data Set

The USPTO maintains a "file wrapper" for each filed patent application. The file wrapper includes all substantive correspondence between a patent applicant and the USPTO. This correspondence is known as the file history. Over the past several years, the USPTO has transitioned to an electronic database for storing its records. Using the USPTO electronic database, I obtained biographical data for 21,000+ randomly

69. Pub. L. No. 103-182, 107 Stat. 2057 (NAFTA); Pub. L. No. 103-465, 108 Stat. 4809 (URAA).

70. DENNIS D. CROUCH, UNDERSTANDING THE ROLE OF THE BOARD OF PATENT APPEALS: *Ex Parte* REJECTION RATES ON APPEAL (2009), http://ssrn.com/abstract=1423922 (showing that the vast majority of appealed examiner rejections are for obviousness). For a general discussion of the law of obviousness, *see* KSR Int'l Co. v. Teleflex, Inc., 550 U.S. 398 (2007).

71. This also occurs during prosecution with the USPTO. *See Ex parte* Dimarchi, Appeal No. 2004-0250, 2004 WL 1046908 (B.P.A.I. 2004) (rejecting a patent application based on an additional reference with an effective date earlier than the applicant's sworn invention date).

selected[72] patent applications filed between 2000 and 2007.[73] The biographical data includes a listing of affidavit filings. After obtaining the affidavits, we categorized them by hand to identify those affidavits associated with an applicant asserting rights based on the invention date.[74]

2. The Pervasiveness (or Lack Thereof) of Rule 131 Affidavit Practice

Of the 21,000+ file histories in the data set, only 0.7% (138) included a Rule 131 affidavit asserting invention-date-based novelty rights.[75] Typically, applicants filed these affidavits years after filing the initial patent application. Both the average time and median time for filing a Rule 131 affidavit were 33 months after filing the initial application.[76] Table 1 reports the rate of Rule 131 affidavit filing by the USPTO Technology Center[77] for applications filed between 2000 and

72. I used a uniform distribution random number generator to choose the patent applications to access. The large sample size helps to ensure that it is representative.

73. There are two primary reasons for reaching back only to 1999. First, the file history records of patent applications filed prior to 1999 are not consistently accurate. Second, prior to November 29, 1999, the file history records only included information for applications associated with issued patents, *see* American Inventors Protection Act of 1999, Pub. L. No. 106-113, 113 Stat. 1501 (1999), whereas this study includes data on abandoned patent applications as well.

Application file histories do not become public until after publication. In order to account for the eighteen-month delay between application filing and publication, *see* 35 U.S.C. § 122 (2008) ("[E]ach application for a patent shall be published . . . promptly after the expiration of a period of 18 months from the earliest filing date for which a benefit is sought under this title."), data for this study was only collected from applications filed through the end of calendar year 2007.

74. Affidavits are filed for several reasons. In addition to those filed under Rule 131, applicants also submit affidavits under Rule 130 (37 C.F.R. § 1.130 (2008)) to "disqualify commonly owned patent or published application as prior art" from being used against them in an obviousness rejection and Rule 132 (37 C.F.R. § 1.132 (2008)) as evidence "to traverse the rejection or objection on a basis not otherwise provided."

75. This very small proportion of positive observations suggests that the distribution is well-modeled with the Poisson distribution. Using a Poisson distribution, the 95% confidence interval ("CI") for the expected proportion of file histories containing a Rule 131 affidavit is 0.4–0.9%. Limiting the sample to applications filed from 2000 to 2005 does not change these results even though most affidavits are filed well into prosecution. *See infra* note 76.

76. The average time from the application filing date to the date Rule 131 affidavit submission was 32.6 months ±2.4 months at 95% CI. The median time from filing was 33.1 months. When the sample is limited to applications filed between 2000 and 2005, the average time from filing moves up slightly to 33.4 months ±2.4 months at 95% CI, and the median becomes 33.2 months. Note that this difference does not indicate that applicants are filing the affidavits more quickly. Rather, the difference reflects a skew in the data for recently filed applications since it would be impossible for a December 2007 application to be associated with an affidavit filed more than nineteen months from its filing.

77. This analysis was limited to applications filed between 2000 and 2005 to avoid data skew. Because of the USPTO backlog, many of the more recently filed applications had not even received an initial action on the merits.

2005.[78] Applications in Technology Center 1600—inventions related to biotechnology and organic chemistry—had the highest likelihood of containing a Rule 131 affidavit in the file history at 1.43%, while applications in Technology Center 2800—inventions relating to semiconductors, electrical, and optical systems and components—had the lowest likelihood at 0.41%.[79]

AFFIDAVITS FILED MORE FREQUENTLY BY U.S. APPLICANTS: Table 1 also reports an important distinction between applications that claim and those that do not claim foreign priority under 35 U.S.C. § 119. Those claiming foreign priority are much less likely to assert invention-date-based rights than their U.S. counterparts.[80] I did not, however, find a statistical difference in affidavit practice given original patent applications as compared to either continuations or original applications claiming priority to a provisional application.

TABLE 1
FREQUENCY OF RULE 131 AFFIDAVIT FILING
(APPLICATIONS FILED 2000–2005)

	Technology Center	All Apps	Apps with R. 131 Affidavit	Percent with R. 131 Affidavit	95% CI
1600	Biotechnology and Organic Chemistry	1884	27	1.43%*	0.57%
1700	Chemical and Materials Engineering	2506	21	0.84%	0.38%
2100	Computer Architecture, Software, and Information Security	1417	14	0.99%	0.56%
2600	Communications	2202	18	0.82%	0.40%
2800	Semiconductors, Electrical and Optical Systems	3865	16	0.41%*	0.21%
3600	Transportation, Construction, E-Commerce, Agriculture	2285	16	0.70%	0.36%
3700	Mechanical Engineering, Manufacturing, Products	2806	12	0.43%	0.26%
	Application Origin				
	Claims Foreign Priority	6709	14	0.21%*	0.16%
	No Foreign Priority	10717	115	1.07%*	0.20%

78. *See* Mark Lemley & Dan Burke, *Policy Levers in Patent Law*, 89 VA. L. REV. 1575, 1696 (2003) (describing some differences in practice between the various technology centers).

79. Statistically, we can reject the null hypothesis that the frequency of Rule 131 affidavit filing is equal in these two Technology Centers at the 5% level of significance. The only other statistically significant difference is between Technology Center 1600 and Technology Center 3700—Mechanical Engineering, Manufacturing, Products. Based on the data here, the null hypothesis cannot be rejected for the other Technology Centers.

80. Here, the null hypothesis is rejected at the 1% level of significance. This result adds credence to the survey responders who suggested that the U.S. first-to-invent system "discriminates against non-US applicants." Response 805103441 to Dennis Crouch, Survey, *infra* app. 4.

3. The Effectiveness and Distribution of Rule 131 Declarations

Table 2 shows the current statuses of cases filed under Rule 131 affidavits as of July 2009. Compared to the data set as a whole, the cases with a Rule 131 affidavit were more likely to still be pending and less likely to be either abandoned or patented by that date.[81] However, the rate of patent issuance in completed cases did not differ significantly based on whether the applicant had filed a Rule 131 affidavit. Among the completed cases,[82] 76% of applications with a Rule 131 declaration resulted in an issued patent as compared with 70% of all completed cases in the data set.

TABLE 2
FINAL STATUSES OF CASES WITH A RULE 131 DECLARATION
(APPLICATIONS FILED 2000–2005)

Status of Application	All Apps	Apps with R. 131 Affidavit	Per cent with R. 131 Affidavit	95% CI
Abandoned	4331	21	0.48%	0.22%
Pending	2728	42	1.54%	0.49%
Patented	10280	66	0.64%	0.16%

In considering the effectiveness of filing a Rule 131 affidavit, I also tested whether any major subsequent actions were necessary after the filing of the Rule 131 affidavit. In only twenty cases (16% of the 129), the affidavit led directly to the issuance of a patent without a subsequent office action rejection, request for continued examination (RCE), or appeal. In other words, only 0.12% of applications in the 2000–2005 data set included a Rule 131 declaration that led directly to an issued patent without further substantive action. To put this in perspective, a steadily prolific patent prosecutor may draft and prosecute 800 or so patent applications in a twenty-year career. During her entire career, we would expect her to file fewer than one Rule 131 declaration that directly leads to an issued patent. Notably, antedating was not even necessary in some of the successful cases: for instance, several applicants had received patents in Europe without relying upon any invention-date-based priority.[83]

One of the most oft-cited advantages of the U.S. invention date focus is the relative benefit it brings to individual inventors, new entrant small

81. The null hypothesis that likelihoods are equal is rejected at the 1% level of significance (P-value ("P")=0.000).

82. I define completed cases as those that have reached a final outcome—either patented or abandoned.

83. *See*, *e.g.*, U.S. Patent No. 7,097,535 / EP 1247616 (A1); U.S. Patent No. 6,869,647 / EP 1288013 (A2); and U.S. Patent No. 7,476,698 / EP 1427453 (A1).

companies, and universities.[84] If any of these groups are disproportionately benefiting from the U.S. system, we would expect them to take advantage of their invention-date-based rights.[85] To test this hypothesis, I obtained assignment information (if any) for each application in my Rule 131 affidavit sample,[86] and classified each assignee according to its size and type.[87] Table 3 details the frequency and effectiveness of Rule 131 affidavit filing for various assignee types.

In both absolute and relative terms, companies—especially large and publicly-traded companies—claim invention date rights more often and more successfully than do individual inventors. U.S. publicly-traded companies appear to be disproportionate users of novelty rights: 61% of the applications with Rule 131 affidavits were assigned to these publicly-traded companies. However, the same companies hold only 27% of issued patents.[88]

84. *See generally* sources, *supra* note 20.

85. *But see* accompanying text, *supra* note 241 (suggesting that this may not be the proper comparison).

86. Assignment information was primarily obtained via the USPTO assignment database. Additional patent documents were inspected for applications with no record in the assignment database. Applications with no assignment information were categorized as individual-owned, based on the assumption that patent owners register their assignments or at least list ownership on the face of the patent documents. This assumption is fairly reasonable since most patent assignments are indeed registered and since registration benefits the owners by creating constructive notice of ownership. 35 U.S.C. 261 (2008) ("An assignment, grant or conveyance shall be void as against any subsequent purchaser or mortgagee for a valuable consideration, without notice, unless it is recorded in the Patent and Trademark Office within three months from its date or prior to the date of such subsequent purchase or mortgage."). However, owners are not strictly required to record their ownership.

87. Types of assignees include: Company, Individual (person), Federal Government Entity, and University. State universities were classified as universities only, even though they are also government entities. Companies were categorized based on whether they are large and whether they are publicly traded on the NYSE or NASDAQ stock market. Large companies are those with more than $500 million in annual revenue or a publicly-traded market capitalization of over $1 billion. Company websites and Dun & Bradstreet reports were used to obtain revenue information, extracting the most recent available revenue figures. Wholly-owned subsidiaries were treated as being the size of the parent corporation. Security interest holders were not treated as assignees.

88. The 27% figure is derived from the assignment records for patents issued in 2006. These records are available through the National Bureau of Economic Research Patent Data Project. *See* BRONWYN H. HALL ET AL., THE NBER PATENT CITATIONS DATA FILE: LESSONS, INSIGHTS AND METHODOLOGICAL TOOLS (Nat'l Bureau of Econ. Research, Working Paper No. 8498, 2001). James Bessen reported a 23% figure in looking at a cohort of patents issued in 1991. James Bessen, *The Value of U.S. Patents by Owner and Patent Characteristics*, 37 RES. POL'Y 932 (2008) (calculated from Table 1).

I recognize a limited disconnect between the 61% and 27% figures in that the first measures the proportion of *applications* associated with a Rule 131 affidavit and the second reports the proportion of *patents* held by publicly-traded companies. This disconnect is unavoidable because the only population data available is organized by issued patent, and my hypothesis requires consideration of the effectiveness of patent applicant attempts to antedate by considering applications that do not issue as patents. However, the data available suggests that this

Meanwhile, individual usage of invention-date-based novelty rights did not differ significantly from that expected: the proportion of applications with Rule 131 affidavits that were filed by individual inventor-owners closely resembled the proportion of inventor-owners in the general population of patentees. On the other hand, the percentage of applications with Rule 131 affidavits that were filed by universities essentially doubled the share expected given the ordinary frequency of university-owned patents.[89] Perhaps surprisingly, applications with Rule 131 affidavits were also much more likely to be filed by government entities than the ordinary frequency of government-owned patents would suggest.[90] The clearly underrepresented group is that of foreign companies whose applications only represent 10% of those asserting novelty rights but occupy almost half of the general population of patents.[91]

TABLE 3
FREQUENCY AND EFFECTIVENESS OF RULE 131 AFFIDAVITS BASED ON ASSIGNEE STATUS (APPLICATIONS FILED 2000–2005)

Assignee Type	Applications Having R 131 Affidavit		Percent of Patents in General Population owned by Assignee Type	Allowance Rate: Percent of Completed Cases having R 131 Affidavit that are Patented	Percent of Applications having R 131 Affidavit that are Still Pending
Large Company	89	72%		81%	33%
Publicly Traded U.S. Company	74	61%	27%	78%	31%
Individual or Unassigned	9	7%	8%	22%	0%
University	6	5%	2%	67%	50%
Federal Government	5	4%	0.4%	100%	50%
Foreign Company	12	10%	47%	100%	25%
All Companies	106	82%		82%	31%
Entity Status					
Large Entity	100	78%	77%	78%	32%
Small Entity	29	22%	23%	68%	34%

disconnect is indeed limited. In my sample, the 61% figure, representing the proportion of *applications* with Rule 131 affidavits that are assigned to publicly-traded companies, shifts to 59% when looking at the proportion of *patents* with Rule 131 affidavits that are assigned to publicly-traded companies.

89. *See* NAT'L SCI. BD., SCIENCE AND ENGINEERING INDICATORS 2008 tbl.5-40, *available at* http://www.nsf.gov/statistics/seind08/ (providing data that from 2000–2005, universities received 18,682 U.S. patents, representing approximately 2% of the total 967,980 U.S. utility patents granted during that period).

90. PATENT TECH. MONITORING TEAM, USPTO, REPORT ON PATENTING BY ORGANIZATIONS 2008 at 5 (Mar. 2009), *available at* http://www.uspto.gov/web/offices/ac/ido/oeip/taf/topo_08.pdf.

91. *Id.*

As measured by allowance rates, companies tend to have much more success than individual inventors in obtaining patent protection through the assertion of their invention dates in Rule 131 affidavits.[92] As shown in Table 3, for applications with a Rule 131 affidavit, compare a 78% allowance rate for public-company-owned applications with a 22% patenting rate for individual-owned applications and 67% for university-owned applications.[93]

An alternative way to categorize patent applicants is through the USPTO owner-status identifier of either large or small entity. Under USPTO rules, a small entity is entitled to fee reductions for many basic USPTO fees.[94] To qualify as a small entity, an applicant must be (1) an individual person, (2) a company with fewer than 500 employees, or (3) a nonprofit organization or university.[95] In addition, the patent cannot be subject to a license or duty to assign to a non-qualifying organization and, in the case of an individual owner, cannot be subject to any license or duty to assign.[96] I found that 22% of the applications associated with a Rule 131 affidavit are legal small-entities—a figure roughly proportional to the 23% of patents owned by small entities.[97] Thus, the legal entity status does not appear to correlate with any significant difference in Rule 131 affidavit practice. The primary members of the large entity group are publicly-traded U.S. corporations (the highest users of Rule 131 affidavits) and foreign entities (the lowest users of Rule 131 affidavits). They seem to substantially balance one another in the group results.

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92. Here, the allowance rate is calculated based on completed cases (both issued patents and abandoned applications) and thus ignores those still pending at the time of data collection in July 2009. The rates calculated here also ignore ancestor or descendent patents. *See* Cecil D. Quillen, Jr., & Ogden H. Webster, *Continuing Patent Applications and Performance of the U.S. Patent and Trademark Office—One More Time*, 18 FED. CIR. B.J. 379 (2009) (discussing methodologies for calculating allowance rates); Cecil D. Quillen, Jr., et al., *Continuing Patent Applications and Performance of the U.S. Patent and Trademark Office—Extended*, 12 FED. CIR. B.J. 35 (2002) (same); Cecil D. Quillen, Jr., & Ogden H. Webster, *Continuing Patent Applications and Performance of the U.S. Patent and Trademark Office*, 11 FED. CIR. B.J. 1 (2001) (same).

93. Here, we can reject the null hypothesis that the grant rate for these company-owned applications is equal to the grant rate for the corresponding inventor-owned applications at the 1% level of significance. We cannot, however, reject the null hypothesis that the grant rate for company-owned applications is equal to the grant rate for university-owned applications.

Technology center is a potential confounding factor, but it does not appear to influence the outcome here—largely because the two technology centers with the respective highest and lowest rate of Rule 131 affidavit filing (TC 1600 Biotechnology and TC2800 Semiconductors) are the ones also the least likely to be associated with independent inventors. For universities, the number of patents is simply too small to test for the importance of the technology center.

94. 35 U.S.C. § 41(h)(1) (2008).

95. 37 C.F.R. § 1.27 (2008).

96. *Id.*

97. I calculated the population statistic from a sample of 1720 issued patents with filing dates from 2000 to 2007. *See also* James Bessen, *The Value of U.S. Patents by Owner and Patent Characteristics*, 37 RES. POL'Y 932, 937 (2008) (reporting that the owners of 30.17% of patents issued in 1991 asserted small entity status).

4. The Timing of Rule 131 Affidavits

Table 4 shows the timing of the filing of the Rule 131 affidavits relative to substantive patent prosecution events. The table reports the relative percentages of the 129 Rule 131 affidavits in the 2000–2005 data set filed at each stage of prosecution, as well as calculated grant rates. Very few of the affidavit filings (only 2%) occurred prior to any substantive action. In both such cases, the application was a continuation application with a long prior history. The vast majority of affidavits (98%) were filed after a non-final office action had been mailed. Most of those filings (70% of the total) occurred after the non-final office action but before any subsequent action, indicating that applicants who file Rule 131 affidavits tend to do so relatively early in the patent prosecution negotiation. However, as Table 4 suggests, the "relatively early" affidavit filings ordinarily include multi-year pendencies.

TABLE 4
THE TIMING OF RULE 131 AFFIDAVITS

Timing of Filing of R. 131 Affidavit	Number of Applications with R 131 Affidavit	Average Pendency From Application Filing to R 131 Affidavit (months)	Allowance Rate: Percent of Completed Cases having R 131 Affidavit that are Patented	Percent of Applications having R 131 Affidavit that are Still Pending
Total	129 (100%)	33.4	76%	33%
Prior to Substantive Action	2 (2%)	9.0	50%	0%
After Non-Final	127 (98%)	33.8	76%	33%
After Non-Final but Before Subsequent Action	90 (70%)	30.0	82%	31%
After Final[98]	37 (29%)	43.1	59%	41%
After RCE	21 (16%)	47.0	82%	48%
After Notice of Appeal	5 (4%)	38.7	50%	20%
After Appeal Brief	4 (3%)	39.3	33%	25%
Application is Continuation or CIP	37 (29%)	27.7	78%	27%

98. "The term 'Final Rejection' is a classic legal misnomer." Mark A. Lemley & Kimberly A. Moore, *Ending the Abuse of Patent Continuations*, 84 B.U. L. REV. 63, 66 (2004). A final rejection does not end prosecution. Rather, applicants still have several prosecution options even after receiving a final rejection. These primarily include requesting reconsideration from the patent examiner, filing a request for continued examination under 35 U.S.C. § 132, or filing an appeal to the BPAI. In fact, the USPTO does not typically have authority to terminate prosecution except by issuing the patent. *Id.* at 64 ("While patent examiners can refuse to allow an applicant's claims to ownership of a particular invention, and can even issue what are misleadingly called "Final Rejections," the patent applicant always gets another chance to persuade the patent examiner to change her mind.").

B. *The Applicant Opportunity to Assert Invention-Date-Based Rights*

One possible explanation for the infrequent usage of Rule 131 affidavits could be that examiners only base their rejections on references that trigger the statutory bar of 102(b). In fact, that is not the case.

In order to test whether applicants regularly have the opportunity to antedate references, I measured the frequency at which references cited during prosecution did (and did not) trigger the statutory bar of § 102(b).[99] This distinction allowed me to single out references only available as prior art under § 102(a) or § 102(e) of the Patent Act, i.e., references that would be excludable based on evidence of a prior invention date.[100] To do this, I created a data set of the 500,000+ patents issued from January 2006 to February 2009. Along with biographical data for each patent, I obtained a listing of the prior art references cited during the prosecution of each patent.[101] This included over 11 million cited patent references with an average of 23.0 patent references cited per patent. I then compared the listed publication date of each cited reference with the earliest priority date of the underlying patent to determine whether publication of the reference took place more than one year prior to the filing date. I also compared the publication date of each cited reference to the filing date of the patent in which it was cited to account for the possibility that the applicant would have been unable to claim the asserted priority. Table 5 shows the results: most patents cite some references that do not trigger the statutory bar of § 102(b). Comparing the publication dates of the patent references to the *asserted priority dates* of the patents in the data set indicated that 34% of

99. To be clear, this experiment is premised on the assumption that the cited references are representative of the references actually asserted in prior art rejections. I believe this assumption is reasonable—especially based on the edict on patent applicants to submit references that a reasonable examiner would consider material to patentability. McKesson Info. Solutions, Inc. v. Bridge Med., Inc., 487 F.3d 897, 913 (Fed. Cir. 2007) (reciting standard). In the usual process, an applicant does not address all cited references—although this may become a requirement for certain applications under a proposed set of rules. Dennis Crouch, *USPTO Guidelines for Examination Support Documents (ESD)*, Patently-O, http://www.patentlyo.com/patent/2007/09/uspto-guideline.html (Sept. 13, 2007, 2:42 EST). Ordinarily, applicants only respond to specific examiner rejections. However, nothing indicates that examiners are any more or less likely to assert prior art in rejections because it qualifies under the statutory bar.

100. Subsection 102(b) prior art typically involves information that was publicly available more than one year prior to the applicant's filing date; § 102(a) prior art typically involves information that was publicly available prior to the applicant's invention date; and § 102(e) prior art typically involves third party patent documents that were filed with the USPTO prior to the applicant's invention date. *See* accompanying text, *supra* notes 49–56.

101. For this study, I relied only on prior art "patent data," including issued patents and published patent applications, both U.S. and foreign. These represent over 80% of the cited prior art references. The non-patent references, such as scientific articles or product brochures, were excluded primarily because their dates were not reliably coded. Thus, at least on this factor, this section underestimates the absolute number of references cited.

the cited patent references did not trigger the statutory bar.[102] In contrast, comparing the publications dates of the patent references to the *filing dates* of the patents in the data set indicated that 19% of the cited patent references did not trigger the statutory bar.[103] The 19–34 % span here is based on whether or not applicants are able to fully use their priority as claimed. As expected, a later effective filing date was associated with more prior art that qualifies under § 102(b). The patents in the data set cited an average of 8.0 or, ignoring asserted priority dates, 4.4 patent references not qualifying as § 102(b) prior art. Of those non-§ 102(b) references, about two-thirds presumptively qualify as prior art only under § 102(e), while the remaining presumptively qualify as prior art under § 102(a).[104]

This result becomes more significant when coupled with the data from Part II.A. Although important, the § 102(b) statutory bar does not drive the exceedingly low frequency of attempts to antedate references.[105]

TABLE 5
THE FREQUENCY AT WHICH CITED PATENT REFERENCES DO NOT QUALIFY AS § 102(B) PRIOR ART AND THUS MAY BE SUSCEPTIBLE TO EXCLUSION BASED ON EVIDENCE OF PRIOR INVENTION
(520,000 PATENTS ISSUED JAN. 2006–FEB. 2009).

	Average (Median) Number of References Cited	
	Using Earliest Claimed Priority Date	**Using Actual Filing Date**
All Cited Patent References	23.0 (12)	23.0 (12)
§ 102(b) References	15.0 (8)	18.4 (9)
Non-§ 102(b) References	8.0 (3)	4.4 (2)
§ 102(a) References but not § 102(b) References	2.4 (1)	1.7 (1)
§ 102(e) References but not § 102(a) or § 102(b)	5.5 (2)	2.6 (1)

102. Seventy-six percent of the patents claimed priority to an earlier filing, such as a prior U.S. patent application, a provisional U.S. patent application, a foreign patent application, or an international application filed under the Patent Cooperation Treaty ("PCT"). Of those claiming priority, the average claim was for 22 months, and the median claim was for less than one year. Fewer than 3% of issued patents claimed priority reaching back more than six years before the filing date.

103. Although I do not present historic data here, this result is likely shifted by the 2001 introduction of published patent applications. The publication of applications creates more prior art—since some of the published applications will never issue as patents—and allows examiners to assert the prior art rejections at an earlier date. *See supra* pt. II.C.

104. This analysis assumes that all patent applications cited as references and having a publication date after the filing date (or priority date) of the application qualify as § 102(e) prior art. I use the word "presumptively" because the USPTO would presume during patent prosecution that these references qualify as prior art based on their publication or filing dates.

105. Subject to the discussion, *supra* note 99.

This analysis does not distinguish between prior art references created by the applicant ("self cites") and those created by a third party. Typically, Rule 131 affidavits are only asserted to avoid third party references and the process for avoiding self cites is much easier—so long as those references do not qualify as § 102(b) prior art.[106] Prior studies of patent citations have estimated that the owner of the underlying patent is also the owner of the cited prior art about one third of the time.[107] Even excluding those, however, the bottom line remains clear: the statutory bar is not the driver behind the low frequency of attempts to antedate references.

C. *Provisional Patent Applications as a Functional Substitute for Invention-Date-Based Novelty Rights*

With some caveats, provisional patent applications can serve as functional substitutes for the U.S. filing grace period.[108] Indeed, although not proven here, it is quite possible that it is early provisional patent application filings that have largely eliminated the practice of swearing-behind prior art references.

Provisional patent applications have become popular since being made available in 1995.[109] The USPTO reports that applicants filed 143,030 provisional patent applications in fiscal year ("FY") 2008,

106. *See supra* pt. II.

107. *See* Manfred M. Fischer et al., *Patents, Patent Citations, and the Geography of Knowledge Spillovers in Europe*, *in* MANFRED M. FISCHER, INNOVATION, NETWORKS, AND KNOWLEDGE SPILLOVERS 242 (2006) (calculating, based on studies of patents issued on applications filed in 1990 and 1995, that 32% of cited references are owned by the assignee of the underlying patent).

108. *See* JOSH LERNER, THE PATENT SYSTEM AND COMPETITION, A STATEMENT TO THE FEDERAL TRADE COMMISSION AND DEPARTMENT OF JUSTICE HEARINGS ON COMPETITION AND INTELLECTUAL PROPERTY LAW AND POLICY IN THE KNOWLEDGE-BASED ECONOMY 7 (2002), http://www.ftc.gov/opp/intellect/lernerjosh.pdf. ("[The argument that small inventors take longer to prepare patent applications] appears to be specious [in part because] recent reforms of the U.S. system have created a new provisional patent application, which is much simpler to file than a full-fledged application."); *See also* BUNDESMINISTERIUM FÜR BILDUNG UND FORSCHUNG [GERMAN FEDERAL MINISTRY FOR EDUCATION AND RESEARCH], ZUR EINFÜHRUNG DER NEUHEITSCHONFRIST IM PATENTRECHT—EIN USA-DEUTSCHLAND-VERGLEICH BEZOGEN AUF DEN HOCHSHULBEREICH [THE INTRODUCTION OF A GRACE PERIOD IN PATENT LAW—A US-GERMANY COMPARISON BASED ON HIGHER EDUCATION] 3 (2002), http://www.bmbf.de/pub/neuheitsschonfrist_im_patentrecht.pdf.

109. *See* New Railhead Mfg., L.L.C. v. Vermeer Mfg. Co., 298 F.3d 1290, 1294 (Fed. Cir. 2002) ("As a part of the Uruguay Round Agreements Act, the Patent Statute was amended to allow applicants to file provisional applications that could provide the priority date for a non-provisional utility application filed within one year of the provisional."); Brian I. Marcus, *Provisional Patent Applications, Their Practical Uses & Potential Pitfalls*, 835 PLI/PAT 147, 151 (2005); Sean B. Seymore, *The "Printed Publication" Bar After Klopfenstein: Has the Federal Circuit Changed the Way Professors Should Talk About Science?*, 40 AKRON L. REV. 493 (2007); USPTO, FILING YEARS AND PATENT APPLICATION SERIAL NUMBERS SINCE 1882, http://www.uspto.gov/go/stats/filingyr.htm (last visited October 8, 2009).

compared with 466,147 non-provisional utility applications that year.[110] U.S. applicants file a great majority of these provisional applications,[111] which also correspond to more than half of the annual total of utility applications filed by U.S. residents.[112]

A provisional application is essentially a low-cost placeholder that allows an applicant to establish a priority date by filing a description of the invention along with paying an administrative fee to the USPTO.[113] The applicant may later file a non-provisional application claiming the benefit of the provisional application's filing date.[114] The provisional patent application has a twelve-month non-extendable pendency.[115] During that time-period, the application is kept secret and is not examined.[116] Thus, to rely upon the provisional priority date, the applicant must submit a non-provisional application within one year of the provisional filing date.[117] Professor Seymore notes several additional strategic advantages of filing provisional patent applications: "extending the patent term to twenty-one years, postponing the examination period, trolling for prior art, and avoiding an allegation of inequitable conduct."[118] In his article, Mr. Slate expands upon this notion, focusing especially on how a provisional patent application can be effective when filed early in the invention development process:[119]

110. USPTO, ANNUAL REPORT FOR FISCAL YEAR 2008 at 115 (2008), *available at* http://www.uspto.gov/web/offices/com/annual/2008/2008annualreport.pdf.

111. My study of 13,000 patents issued in 2008 found that only about 18% of patents, for which ownership had been assigned and priority linked to a provisional application, were owned by a non-U.S. entity. *But see* William B. Slate, *In Defense of the Misunderstood Provisional Application*, 85 J. PAT. & TRADEMARK OFF. SOC'Y 219, 227 (2003) (suggesting several reasons why foreign applicants may choose to file for provisional patent rights). Although Canada has not been one of the top five countries of origin for patentable inventions in the past decade, USPTO, PATENTS BY COUNTRY, STATE, AND YEAR (December 2008), *available at* http://www.uspto.gov/web/offices/ac/ido/oeip/taf/cst_utl.htm, my data shows that Canada does lead all non-U.S. countries in the filing of provisional U.S. patent applications.

112. *See* USPTO, *supra* note 110, at 115–23.

113. 35 U.S.C. § 111(b) (2008). A drawing must be submitted "where necessary for the understanding of the subject matter sought to be patented." 35 U.S.C. § 113 (2008).

114. 35 U.S.C. § 119(e)(1) (2008). The non-provisional application must share "at least one common inventor" with the provisional application. *Id.*

115. 35 U.S.C. § 111(b)(5) (2008) ("The provisional application shall be regarded as abandoned 12 months after the filing date of such application and shall not be subject to revival after such 12-month period.").

116. 35 U.S.C. § 122 (2008); USPTO, PROVISIONAL APPLICATION FOR PATENT, http://www.uspto.gov/web/offices/pac/provapp.htm (last visited October 9, 2009) ("Provisional applications are not examined on their merits.").

117. 35 U.S.C. §§ 111(b)(5) (2008).

118. Seymore, *supra* note 109, at 519.

119. Slate, *supra* note 111, at 223; *see also* Charles E. Van Horn, *Practicalities and Potential Pitfalls When Using Provisional Patent Applications*, 22 AIPLA Q.J. 259, 297 (1994); Dennis Crouch, *Provisional Patent Applications: Waiting to File Non-Provisionals*, Patently-O, http://www.patentlyo.com/patent/2009/02/untitled-1.html (Feb. 22, 2009, 18:11 EST).

> 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.[120]

To test the relevance of provisional patent applications as a tool for claiming priority, I created a data set of the 620,000+ issued patents for which applications were filed between 2000 and 2005. For each patent, I tallied whether it claimed priority to one or more provisional patent applications. Seventeen percent of the patents in the data set claim priority to at least one provisional application.[121] On average, the patents claiming priority listed 1.4 provisional patent applications. Abandoned non-provisional patent applications have a somewhat higher rate of claiming priority to provisional patent applications at 22%.[122]

Collectively, these figures indicate that a large number of provisional applications are themselves left floundering to be abandoned twelve months after filing. The large number of abandoned provisional applications suggests to me that provisional patent applications are likely being used as early place-holders to cheaply secure a priority date, rather than as a means of extending the patent term or postponing examination. Anecdotal reports suggest that this practice has become especially prevalent

120. Slate, *supra* note 111, at 227.

121. For a more limited study of the percentage of patents claiming priority to at least one provisional application, *see* Dennis Crouch, *A First Look at Who Files Provisional Patent Applications*, Patently-O, http://www.patentlyo.com/patent/2008/06/a-first-look-at.html (June 3, 2008, 6:05 EST) (finding that 21% of patents issued in April and May 2008 claim priority to at least one provisional application).

122. Based on a study of 4331 abandoned non-provisional utility patent applications filed from 2000 to 2005, I found that 22% (969) claim priority to one or more provisional applications. On average, the abandoned applications that claim priority listed 2.0 provisional patent applications. Based on these differences, the null hypotheses can be rejected at the 1% level of significance.

among universities developing early stage innovations.[123] Additionally, a small minority of applicants may be using incremental provisional applications to repeatedly update the disclosure before filing the utility application.[124] However, the value of incremental provisional application filings is limited by the hard twelve-month deadline for filing a non-provisional application.[125]

For an inventor who has conceived a new invention, the legal benefits of filing a provisional application, rather than relying on the invention date, are compelling. If the filing deadlines are met, a provisional patent application will serve as conclusive evidence of priority—without any need for any affidavits or declarations—so long as the provisional application discloses the invention claimed in the non-provisional application "in the manner provided by the first paragraph of section 112."[126] In other words, the specification of the provisional application must "contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable" an ordinarily skilled artisan to practice the invention claimed in the non-provisional application.[127]

Unlike an applicant seeking to assert a prior invention date, an applicant claiming priority to a provisional application need not provide corroborated evidence—or indeed any evidence—of actual reduction to practice, conception date, or reasonable diligence in working toward reduction to practice. Rather, the USPTO and courts treat the filing of a provisional patent application as a constructive reduction to practice, thus allowing the applicant to rely on the simple evidence of the paper filing.[128]

An oft-stated disadvantage of provisional application filings is that they may create a false sense of security among patent applicants.[129] Cer-

123. *See* Oded Hecht, *Extensive Use of Provisional Patent Applications in University Settings*, INTELL. PROP. TODAY, June 2006, at 8 (noting that provisional filings provide an opportunity for market validation prior to utility patent filing); Irving N. Feit & Lauren T. Emr, *Provisional Patent Application, Reality and Myth*, INTELL. PROP. TODAY, Dec. 2002, at 8. 124 Indeed, I found that about 3% of non-provisional utility patent applications claim priority to three or more provisional applications.

125. *See* 35 U.S.C. § 111(b)(5) (2008).

126. 35 U.S.C. § 119(e) (2008); *see* New Railhead Mfg., L.L.C. v. Vermeer Mfg. Co., 298 F.3d 1290, 1294 (Fed. Cir. 2002).

127. 35 U.S.C. § 112 (2008).

128. *See Ex parte* Yamaguchi, 88 U.S.P.Q.2d 1606, 1612–13 (BPAI 2008) (precedential) ("As a constructive reduction to practice, [the] authenticated disclosure [of a U.S. provisional patent application] serves as prima facie evidence that the applicant was in possession of the subject matter disclosed in the provisional application when it was filed.").

129. *See* James Gatto, *Patent Appeals Court Ruling Highlights Potential Pitfalls of Over Reliance on Provisional Patent Applications*, PILLSBURY WINTHROP SHAW PITTMAN CLIENT ALERT, Feb. 2, 2006, at 2–3 (citing New Railhead Mfg., L.L.C. v. Vermeer Mfg. Co., 298 F.3d 1290, 1294 (Fed. Cir. 2002)), *available at* http://www.pillsburylaw.com/siteFiles/Publications/92DC5F7E8A4593367E8EB19227ABE889.pdf.

tainly, a hastily-filed provisional patent application may fail to properly describe the invention to be claimed in a later-filed non-provisional application. However, the validity of this criticism does not suggest that applicants should merely rely upon the hope that they will possess sufficient evidence to antedate references based on a prior invention date. Rather, risk-averse applicants should quickly file a well-supported application, either in provisional or non-provisional form.

However, at least four theoretical barriers exist to treating provisional patent applications as a replacement for the grace period. First, although less expensive[130] and less formal[131] than utility patent applications, provisional patent applications still ordinarily require the selection and identification of the particular inventions to be submitted to the USPTO. This process may be more burdensome than merely retaining evidence of conception and reduction to practice. However, it may well be less burdensome and less prone to error than maintaining evidence of diligence.[132]

Second, accompanying the effort of preparing the provisional application is the likely delay that occurs in filing the provisional application. Delay may be especially likely for new entrants into the patent system who may need additional time to understand the system, hire counsel, and create their own project pathway.[133] Likewise, university departments responsible for patenting are notoriously slow. In addition to the delay in filing—which in the absence of a grace period would postpone the earliest potential priority date—applicants also reduce the eventual length of the patent term by filing the follow-on utility application less than one year after filing of the provisional application.[134]

The third problem is that of settled expectations. Although the 1995 creation of provisional patent applications is relatively recent compared with the Constitutional origins of the U.S. patent system, the provisional

130. Provisional application filing fees were $220—or $110 for a small entity—in fiscal year 2009. *See* 37 C.F.R. § 1.16(d) (2008). Payment of this filing fee permits the applicant to submit a provisional application up to 100 pages in length. Longer provisional applications trigger a surcharge of $270—or $135 for a small entity—for each additional 50 pages. 37 C.F.R. § 1.16(s) (2008). By comparison, non-provisional utility patent application filing fees total $1090, which includes the $330 basic filing fee, 37 C.F.R. § 1.16(a)(1) (2008), a $540 search fee, 37 C.F.R. § 1.16(k) (2008), and a $220 examination fee, 37 C.F.R. § 1.16(o) (2008). Lengthy non-provisional applications trigger additional surcharges. 37 C.F.R. § 1.16(h–i) (2008).

131. Provisional application are not required to include claims and are not examined. 35 U.S.C. § 111(b) (2008).

132. *See infra* pt. II.F (discussing the difficulty of establishing an invention date).

133. *See generally* sources, *supra* note 28.

134. *See* Dennis Crouch, *Provisional Patent Applications: Waiting to File Non-Provisionals*, Patently-O, http://www.patentlyo.com/patent/2009/02/untitled-1.html (Feb. 22, 2009, 18:11 EST).

patent application process has existed long enough that the application of most in-force patents occurred after the new filing form became available. During this entire time, provisional applications have in essence extended the grace period rather than replace it. In my study of Rule 131 affidavits, 29% of applications with Rule 131 affidavits also claimed priority to a provisional application.[135] For those applications, the purpose of the Rule 131 affidavit was to push novelty rights beyond even the provisional application priority date. Thus, in the settled rights construct, provisional applications may not substitute for Rule 131 affidavits because applicants already rely on both regimes simultaneously.

The fourth issue is the legal limitation of provisional rights. A provisional patent application only allows an applicant to reach back up to one year, while the invention-date-based grace period allows an applicant to antedate § 102(e) prior art that may have been filed years before.[136]

D. *Analysis of the Use of Invention-Date-Based Novelty Rights During Prosecution of Higher Value Patents*

Patent values are highly skewed.[137] Most patents have a modest value, while a much smaller quantity are "highly valuable." Quite often, patent applicants know that particular pending patent applications are highly valuable, and those applications may veer along a unique prosecution course that is more careful and deliberate.[138] Supporters of invention-date-based novelty rights may argue that such rights, although rarely asserted, make a big difference in big cases.

In this section, I want to answer the following question: Are invention-date-based novelty rights asserted more frequently during the prosecution of valuable patents than during patent prosecution generally? To answer this question, I created two data sets of "valuable patents" based on separate selection criteria. For the first set, I looked for patents that have been associated with litigation. Mr. Allison et al. have suggested that litigated patents are more valuable, on average, than non-litigated patents:

> We start from the assumption that litigated patents are at least a subset of the most valuable patents, and we have no reason to believe that valuable patents that are not litigated differ in any

135. Notably, however, these applications amounted to less than 1% of all applications claiming priority to a provisional application.

136. CHISUM, *supra* note 17, at § 3.08.

137. Dennis D. Crouch, *The Patent Lottery: Exploiting Behavioral Economics for the Common Good*, 16 GEO. MASON L. REV. 141, 142 (2008).

138. *See* John R. Allison et al., *Valuable Patents*, 92 GEO. L.J. 435, 451 (2004).

> systematic ways from valuable litigated patents. We conclude that the easiest way to discover the characteristics of valuable patents is to study litigated patents.[139]

Thus, to create my first "valuable patents" data set, I compiled the prosecution file histories of a randomized sample of 3070 litigated patents filed between January 2000 and July 2009.

For the second "valuable patents" data set, I selected patents listed in the FDA's "Orange Book."[140] The Orange Book lists patents covering various aspects of FDA-approved drugs. These drug patents are typically highly valuable and have specialized legal protections.[141] Thus, to create my second "valuable patents" data set, I compiled the prosecution file histories of all 806 patents that were issued between 2000 and 2009 and are listed in the Orange Book.

Following the same procedure outlined Part II.A.1, one reviewer examined each affidavit filed during the prosecution of the patents in each data set and identified those affidavits asserting invention date rights.[142] Those affidavits were typically labeled as Rule 131 affidavits by the applicants.

Of the 3070 litigated patents, 2.5% (78) were associated with a Rule 131 affidavit asserting pre-filing invention date rights.[143] Although small, this rate is more than quadruple the rate of Rule 131 affidavit filing for all patents.[144] Of these 78 patents, 96% (75) are of U.S. origin, and 37% (29) stretch the priority date further by claiming rights to a provisional patent application.

Of the 806 patents listed in the Orange Book, 2.2% (18) were associated with a Rule 131 affidavit asserting pre-filing invention date rights. Here, it does not make sense to compare the rate of affidavit filing for the Orange Book patents to that of the general population of patents because Technology Center 1600 examined each of these 18 patents. As

139. *See* Allison et al., *supra* note 138, at 437.

140. *See* CTR. FOR DRUG EVALUATION AND RESEARCH, FOOD & DRUG ADMIN., APPROVED DRUG PRODUCTS WITH THERAPEUTIC EQUIVALENCE EVALUATIONS (29th ed. 2009), *available at* http://www.fda.gov/cder/orange/obannual.pdf.

141. 35 U.S.C. § 271(e) (2008) (creating a cause of action for patent infringement based on a generic manufacturer's request for FDA approval of a drug covered by a patent listed in the Orange Book).

142. For the procedure used to identify file histories including Rule 131 affidavits, *see supra* pt. II.A.

143. Limiting the sample to applications filed between 2000 and 2005 does not change the reported percentage. Of the 2686 litigated patents in my data set with filing dates between 2000 and 2005, 2.5% (68) were associated with a Rule 131 affidavit filing.

144. *See infra* tbl.6. We can reject the null hypothesis that the rate of litigated patents being associated with a Rule 131 affidavit is equal to the corresponding rate for either the general population of applications or the general population of issued patents at the 1% level of significance.

noted above, Technology Center 1600 had the highest rate of applications associated with Rule 131 affidavits of any technology center (1.4%).[145]

In an insightful follow-on paper to *Valuable Patents*, Ms. Moore considered the properties of "worthless patents."[146] As a premise for her paper, Ms. Moore identified worthless patents as those patents that were allowed to expire due to failure to pay maintenance fees.[147] Using a similar methodology, I created a compilation of 494 issued patents with filing dates between 2000 and 2005 that had expired by July 2009 due to failure to pay maintenance fees. Of those patents, only 0.4% (2) were associated with a Rule 131 affidavit asserting pre-filing invention date rights.

TABLE 6
RATE OF RULE 131 AFFIDAVIT FILING BY PATENT CATEGORY

Category	Count	Rate
All Applications	17,426	0.7%
All Patents	10,280	0.6%
Litigated Patents	3,070	2.5%
Expired Patents	494	0.4%
Orange Book Patents	806	2.2%
Patents in TC 1600	1,884	1.4%

These results appear in Table 6 and support several potential interpretations. Notably, pushing back against the original presumption of value in litigated patents is the prospect of Rule 131 affidavits actually leading to more litigation by exposing weaknesses in the patents. The following section explores this possibility through a qualitative analysis of practitioner surveys.

E. *Survey of Reliance on Invention-Date-Based Novelty Rights During Patent Prosecution*

1. Survey Design and Dissemination

In the summer of 2009, I conducted an electronic survey of 1141 responders—mainly self-identified U.S. patent law professionals. These individuals primarily include registered U.S. patent attorneys and agents

145. *See supra* pt. II.A. Comparing the overall rate of affidavit filing in Technology Center 1600 with the rate of affidavit filing in the Orange Book patents, we *cannot* reject the null hypothesis that the two rates are equal.

146. Kimberly A. Moore, *Worthless Patents*, 20 BERKELEY TECH. L.J. 1521 (2005).

147. *Id.* at 1526.

and patent litigators.[148] The purpose of the survey was to elicit practitioner estimates of the reliance upon invention-date-based novelty rights during patent prosecution.[149] The survey was also intended to provide some understanding of patent applicants' relative preference for filing Rule 131 affidavits as compared to other avenues of prosecution, such as simply arguing that the invention to be patented is non-obvious when compared with the putative prior art.[150] The survey additionally considers how these experiences and preferences correlate with support for the U.S. first-to-invent system over a potential first-to-file system.[151] I grouped responders according to their reported qualifications,[152] area of business or technology,[153] and position.[154]

In creating the survey, I sought to obtain both quantitative and qualitative results. Thus, the survey asked applicants to select objective responses from a list of choices and provided an opportunity for applicants to more fully explain their answers.[155] The survey was kept short to ensure a higher completion rate. A printed version spans only two pages.[156] The median responder took fewer than three minutes to complete the survey and 90% of the responders completed the survey in fewer than ten minutes.

I primarily disseminated the survey online through the Patently-O website and to opt-in subscribers of the Patently-O daily e-mail for one month during the summer of 2009.[157] In addition, I posted a notice of the survey to the Patently-O group on Facebook.[158] I used the online survey

148. Ninety-four percent of responders self-identified as either patent attorneys or agents registered to practice before the USPTO or as unregistered U.S. attorneys handling patent law issues. Other responders included law students, inventors, professors, patent examiners, and other government officials. Considerable overlap existed between these categories.

149. *See infra* app. 1, questions 1 and 2.

150. *See infra* app. 1, question 3.

151. *See infra* app. 1, question 4.

152. Listed qualifications included U.S. Attorney, Registered U.S. Patent Attorney/Agent, Inventor, Patent Litigant, Law Student, and Patent Examiner (current or former).

153. Listed areas of business included Litigation, Marketing, Licensing, Business Strategy, Academic, and Other. Listed areas of technology included Biotechnology, Pharmaceutical, Generic Pharma, Telecommunications, Financial Services, Chemical, Mechanical, Software, Automotive, Nanotechnology, Electrical, Medical Devices, and Other.

154. Listed positions included In House Attorney/Agent, Law Firm (Litigation), Professor, Inventor, Owner, Examiner (Patent Office), Law Firm (Prosecution), Student, Business Management, Judiciary, and Consultant.

155. For full results of the objective questions on the survey, *see infra* app. 2. For a complete listing of explanatory responses, *see infra* apps. 3–4.

156. *See infra* app. 1.

157. Dennis Crouch, *Survey: Swearing Behind Prior Art*, Patently-O, http://www.patentlyo.com/patent/2009/06/survey-swearing-behind-prior-art.html (June 2, 2009, 07:57 EST).

158. Patently-O etc. Facebook Group, http://www.facebook.com/group.php?gid=4012000626&ref=ts (last visited Oct. 9, 2009).

tool SurveyMonkey to administer the survey.[159] Participants were given the opportunity to list their name and contact information, but were told that identifying information would otherwise be kept anonymous.[160]

The introduction to the survey provided the following information:

> US Patent Examiners generally search for prior art dated before the priority filing date of the application being examined. However, on occasion, an applicant can 'swear behind' prior art by showing that its invention date came before the cited art. To do this, an applicant files a Rule 131 declaration. Of course, even under current law, the invention date is meaningless if the prior art creates a statutory bar (having been published for more than one year before the applicant's priority filing date).
>
> Pending legislation would largely eliminate an applicant's ability to use the invention date to avoid prior art. Rather, in a "first-inventor-to-file" system the question is simply whether the applicant's effective filing date [occurs] before the prior art date (with some potential caveats).
>
> We have no evidence indicating how often applicants use Rule 131 declarations. As such, we really cannot predict the impact of a move to first-to-file. This survey is intended to obtain some data.[161]

2. U.S. Attorney and U.S. Patent Agent Participation in Rule 131 Declarations

Table 7 shows descriptive statistics of U.S. Attorney and U.S. Patent Agent survey responses regarding their participation in Rule 131 affidavits.[162] The majority of these responders (83%) indicated that they have "participated in the filing of a Rule 131 affidavit."[163] Those who have participated in the filing of Rule 131 affidavits have a much higher estimate of the percentage of cases that they have "worked with" that include a Rule 131 affidavit. In particular, responders who participated in

159. SurveyMonkey, http://www.surveymonkey.com (last visited Oct. 9, 2009). Although not foolproof, SurveyMonkey uses an algorithm that allows only one response per computer. I did not detect any evidence of attempts to manipulate the voting. Most responders provided some qualitative responses, and there were no duplicates in these responses.

160. *See infra* app. 1, question 8.

161. *See infra* app. 1.

162. Although over 1000 survey respondents self-identified as either a U.S. Attorney or U.S. Patent Agent, there is no way to ensure that the respondents represent a random or representative sample of patent law professionals. Thus, I make no claim that these results can be extended as a predictive estimate of that larger population.

163. *See infra* app. 1, question 1.

the filing of a Rule 131 affidavit estimate that, on average, 3.1% of the cases they have worked with involve a Rule 131 affidavit. Responders who have not participated in the filing of a Rule 131 affidavit estimate that, on average, 0.9% of the cases they have worked with involve a Rule 131 affidavit.[164]

TABLE 7
SURVEY OF U.S. ATTORNEY AND U.S. PATENT AGENT PARTICIPATION IN RULE 131 AFFIDAVITS

Ever Participated in R. 131 Affidavit	Number of Responders	Estimated Percent of Cases with R. 131 Affidavit
Yes	890 (83%)	3.1%
No	183 (17%)	0.9%
Total	1073	2.7%

Chart 1 shows a cumulative frequency of the reported percent of cases worked with that include a Rule 131 affidavit. This data shows that 70% of responders estimate that the percentage of their cases associated with a Rule 131 affidavit filing is either "close to 0%" or "2%."

Table 8 groups the practitioners into two broad areas of technology: (1) Chemistry, Pharmaceuticals, and Biotechnology (Chemistry) and (2) Electrical Engineering, Telecommunications, and Software (Electrical). The results show a significant difference between the groups based on the average estimated percent of cases that they have worked with that include Rule 131 affidavits. Although the absolute percentages are still small, the Chemistry group reported a much higher average estimate than did the Electrical group. These results are consistent with the oft-presented notion that on a per-patent basis, patents related to chemistry, pharmaceuticals, and biotechnology are more valuable than those related to electrical engineering, telecommunications, or software.[165] These two

164. The median responses are "2%" and "close to 0%" respectively for responders who have and have not participated in the filing of a Rule 131 declaration. This data is derived from the results of Question 2. *Infra* app. 1. Question 2 allowed the following set of potential responses: "close to 0%", 2%, 4%, 6%, . . . 20%, and "more than 20%." *Id.* Responses of "close to 0%" were treated as responses of 0.0% in the average calculation, while responses of "more than 20%" were treated as responses of XX%. Since only four respondents selected "more than 20%," the numerical value assigned to XX% did not meaningfully impact the study averages.

165. Dan L. Burk & Mark A. Lemley, *Is Patent Law Technology Specific?*, 17 BERKELEY TECH. L.J. 1155, 1156 (2002).

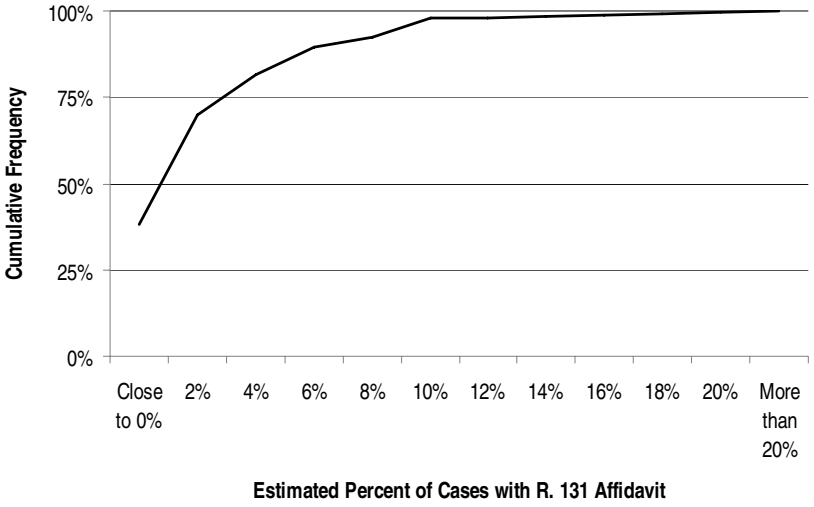
For a discussion of the connection between the value of a patent and the rate of Rule 131 affidavit filing, *see supra* pt. II.C.

broad areas of technology also tend to have substantial differences in patent prosecution practices.[166]

TABLE 8
SURVEY OF PERCEPTION ACCORDING TO TECHNOLOGY AREA

Practitioner Area of Technology	Ever Participated in R. 131 Affidavit	Average Estimated Percent of Cases with R. 131 Affidavit
Chemistry, Pharma and Biotechnology	384 (84%)	3.6%
Electrical, Telecom, and Software	462 (80%)	2.1%

CHART 1
CUMULATIVE FREQUENCY OF THE ESTIMATED PERCENT OF CASES "WORKED WITH" THAT INCLUDE A RULE 131 DECLARATION



3. Support for Moving to a First-to-File System

The survey asked responders whether they support a move to a first-to-file system.[167] As Table 9 shows, a small majority of the U.S. attorney and patent agent responders (55%) indicated that they *did not* support such a move. The responders in the survey who favored a shift to first-to-file indicated that they had slightly less experience with filing of Rule 131 affidavits and in handling cases associated with Rule 131 affidavits.

166. *Id.*
167. *See infra* app. 1, question 4.

TABLE 9
SURVEY OF SUPPORT FOR A MOVE TO A
FIRST-TO-FILE (FTF) SYSTEM

Support Move to a FTF System	Count	Ever Participated in R. 131 Affidavit	Estimated Percent of Cases with R. 131 Affidavit
No	569 (55%)	84.0%	2.9%
Yes	470 (45%)	82.5%	2.5%

The results in Table 9 parallel other opinion surveys in demonstrating some support for U.S. adoption of a first-to-file system amongst patent practitioners.[168] For instance, based on a 1993 survey, the General Accounting Office ("GAO") reported that 66% of major U.S.-based patent owners either "strongly" or "generally" supported adoption while only 22% opposed adoption. The GAO's survey was admittedly skewed toward large companies and did not include universities or other governmental agencies.[169] In their survey, the largest companies, "with more than 10,000 employees, were most supportive of a move to first-to-file, with 75 percent supporting it and only 16 percent opposed."[170]

The responders were given space to provide short written statements regarding their preference for or against a move to first-to-file.[171] The statements largely track the historic debate presented in Part I, and create a richer data set susceptible to qualitative analysis and categorization according to a set of iteratively created themes that emerged from the statements for each statement received.[172] The themes in each statement were identified and tallied in Table 10. Some statements were coded for

168. *See* Allan Mendelowitz, General Accounting Office, Testimony before the US Patent & Trademark Office: US Companies' Views on Patent Law Harmonization (October 7, 1993), *available at* http://www.ibiblio.org/patents/txt/011394.txt; *see also* Robert L. Rohrbeck, *Patent System Policy Planning*, 1983 A.B.A. SEC. PAT. TRADEMARK & COPYRIGHT L. COMM. REP. 65 ("[T]he majority of the members of the committee who responded to the survey did not favor adoption of the first to file system.").

A 2007 poll of 192 readers of Inside Counsel magazine asked, "Should the U.S. adopt a first-to-file application system, replacing the first-to-invent system?" Forty-five percent of responders answered "Yes"; 29.1% answered "No;" and the remaining 26.9% answered "Don't know." *IP Survey: Patent Reforms; Proposed changes for the patent system get mixed reviews from in-house counsel*, Inside Counsel 56 (October 2007) at http://www.insidecounsel.com/assets/article/1421/IC1007_p52-54p56p58p60p62p64.pdf.

169. *See* Mendoliwitz, *supra* note 168.

170. *Id.*

171. Four hundred (35%) of the 1141 responders offered some expositive statement explaining their strategic choice selection. For a complete listing of the qualitative responses, *see infra* apps. 3–4.

172. For a discussion of how explanatory responses can be used for qualitative analysis, *see generally* KIMBERLY A. NEUENDORF, THE CONTENT ANALYSIS GUIDEBOOK 219–223 (2002).

multiple themes. For example, the following statement was coded as including the themes of simplicity, predictability, and international harmony: "Simpler for inventor and practitioners to deal with. Gives some predictability to system that is not very predictable. Aligns the U.S. system with the rest of world."[173]

TABLE 10
EXPLANATORY THEMES OF PREFERENCES
FOR FIRST-TO-FILE AND FIRST-TO-INVENT SYSTEMS

	Support Move to First-to-File	
Explanatory Theme	**Yes**	**No**
Constitution Demands Preference	0.6%	6.3%
Preference Is More Cost Effective	13.6%	4.5%
Preference Benefits Small Entities	3.6%	30.3%
Preference Better Encourages Innovation	0.0%	1.8%
Preference Simplifies the Law	29.6%	2.7%
Change Will Not Make Much Difference	5.3%	2.7%
Preference Creates Predictability	16.6%	0.5%
Alternative Reduces Patent Quality	0.6%	16.3%
Alternative Creates Enablement and Written Description Problems	0.0%	3.2%
International Harmony	30.8%	2.3%
Preference Maintains Status Quo	0.0%	6.3%
Preference Is More "Fair"	2.4%	9.0%

Responders who support the switch to a first-to-file system most often cited international harmonization (30.8%) and simplification (29.6%) in explaining their preferences. The following three examples were typical:

> Simpler—Interferences are so rare.[174]
>
> [B]ecause it's such a mess dealing with all the international differences and that would start some better international-based prosecution structure, hopefully.[175]

173. Response 804179645 to Dennis Crouch, Survey, *infra* app. 4.
174. Response 805552837 to Dennis Crouch, Survey (on file with author).
175. Response 804977690 to Dennis Crouch, Survey (on file with author).

Simplicity and harmonization[176]

A handful of supporters of the first-to-invent system acknowledged that a switch would bring the United States in line with the rest of the world ("ROW"), but challenged the value of harmony. The following examples are typical of this sentiment:

> Placing our patent system in line with the rest of the world's first to file system will bring the US system down to the relatively ineffective level of the rest of the world's patent systems. It will also lead to more poorly written patents.[177]

> The system has its flaws, no doubt. But, that does not mean that Europe is simply correct on everything and we need to follow their lead. First to invent gives smaller/more cost sensitive entities a better chance at patentability.[178]

A significant number (16.6%) of supporters of a switch to a first-to-file system also cited added predictability.

Responders who do not support the switch to a first-to-file system most often cited benefits to small entities, universities, and individual inventors from the first-to-invent system (30.3%) and argued that a first-to-file system would reduce patent quality (16.3%). The following four examples are typical of these sentiments:

> I believe in a first to invent system. I think it is unfair for individual inventors and small businesses to have to file before they are financially able to and it puts more pressure on attorneys to complete the applications faster.[179]

> A race to the patent office will lower "patent quality" (Haste makes waste).[180]

> While it would make things simpler to have a first to file, I don't think it would benefit universities who only have early stage technologies.[181]

176. Response 804473969 to Dennis Crouch, Survey (on file with author).
177. Response 808826549 to Dennis Crouch, Survey (on file with author).
178. Response 804694995 to Dennis Crouch, Survey (on file with author).
179. Response 804411483 to Dennis Crouch, Survey (on file with author).
180. Response 804192506 to Dennis Crouch, Survey (on file with author).
181. Response 805059426 to Dennis Crouch, Survey (on file with author).

> My clients are early stage companies; FTF favors the big players, not my clients, and rubs against the American ethos of "I got there first."[182]

Opposing these thoughts were several responses complaining that the present U.S. first-to-invent system "discriminates against non-U.S. applicants."[183]

Additionally, at least one responder recognized that small inventors are unlikely to attempt to antedate asserted references:

> The concern tends to be for the small inventor but in my experience small inventors never attempt a rule 131.[184]

Both sides argued that their preferred system is more cost effective. First-to-file supporters focused on removing costs of "determining the date of invention" during prosecution and enforcement proceedings.[185] First-to-invent supporters suggested that a first-to-file system would lead to more applications being filed before inventions are screened for value and that "rush" jobs simply cost more.[186]

A number of responders indicated that they would support a hybrid approach: focus solely on the filing date for priority contests but allow an inventor to claim priority to the invention date in cases of intervening prior art. However, responses also questioned the modern role of a grace period. For instance, one response indicated that "[t]he idea that an inventor might test the commercial waters before filing a patent application is anachronistic in my view."[187]

Finally, patent practitioners indicated a concern that a change to first-to-file would open the door to malpractice claims for delays in filing:

> First to file would create potential malpractice liability for attorneys that fail to prepare and file applications "in a reasonable time"—whatever that is later interpreted to mean.[188]

182. Response 804518811 to Dennis Crouch, Survey (on file with author).

183. Response 805103441 to Dennis Crouch, Survey (on file with author). *See also* accompanying text, *supra* note 68. Despite a shift toward allowing proof of non-US invention, very few non-US applicants take advantage of the option.

184. Response 804877686 to Dennis Crouch, Survey (on file with author).

185. Response 808947839 to Dennis Crouch, Survey, *infra* app. 4 ("As a litigator who sees myself on the defense side a lot, it would add additional certainty at the outset of a case.").

186. Response 805331197 to Dennis Crouch, Survey, *infra* app. 4 ("The rush to file quickly would increase cost because it would reduce the ability to schedule the work.").

187. Response 805079708 to Dennis Crouch, Survey, *infra* app. 4.

188. Response 804763278 to Dennis Crouch, Survey (on file with author).

Potential malpractice claims for "untimely" preparation/filing.[189]

4. Strategies and Pitfalls of Asserting First-Inventor Rights During Patent Prosecution

The final substantive question of the survey focused on the relative strategic merits of (1) asserting first-inventor rights to negate putative prior art references or (2) distinguishing the scope of the invention from the disclosures found in the references. Responders were offered a hypothetical situation where either strategy might succeed. The question read as follows:

> Assume that you receive non-final prior art rejection. You believe that you could distinguish the reference without amending any of your claims. However, you also have sufficient evidence to swear behind the reference based on an earlier invention date. Which approach do you take?[190]

Responders were asked to choose one of three options: "Swear behind the reference," "Distinguish your claims from the prior art," and "Swear behind the reference *and* distinguish the claims." In addition, responders were asked to "Explain your answer."

The responses to this question are tabulated in Table 11, which shows a large preference for distinguishing claims from the prior art rather than asserting first-inventor rights by filing a Rule 131 affidavit. While 51% of responders would have distinguished the claims, only 31% would have asserted first-inventor rights, and 18% would have attempted to both distinguish the claim and assert first-inventor rights.[191] The responders in the survey who would have distinguished the claims showed more support for a shift to first-to-file and indicated that they had comparably less experience in handling cases associated with Rule 131 affidavits. However, those differences were not statistically significant.

189. Response 817328944 to Dennis Crouch, Survey (on file with author).
190. *See infra* app. 1, question 3.
191. These percentages have a margin of error of 3% at 95% CI.

TABLE 11
SURVEY OF STRATEGIES FOR ASSERTING
FIRST-INVENTOR RIGHTS

Strategy in Response to Prior Art Rejection	Count	Support Move to a FTF System	Estimated Percent of Cases with R. 131 Affidavit
Assert First-Inventor Rights	336 (31%)	44%	3.1%
Distinguish Claims	544 (51%)	48%	2.6%
Both	193 (18%)	39%	2.7%

Many responders offered an expositive statement of their strategy selection.[192] These results create a richer data set susceptible to qualitative analysis.[193] Analysis and categorization according to a set of themes that emerged from the statements allowed for a thematic tallying in Table 12.

TABLE 12
STRATEGY THEMES IN CHOOSING WHETHER
TO ASSERT FIRST-INVENTOR RIGHTS

	Strategy Choice		
Explanatory Theme of Selected Strategy Choice	Distinguish Invention From Reference	Assert First-Inventor Rights	Follow Both
Choice Driven by Costs	21.1%	3.4%	13.0%
Choice Increases Odds of Obtaining Patent Protection	8.3%	4.7%	33.8%
Choice Provides Shorter Prosecution Timeline	4.1%	1.3%	5.2%
Alternative Creates Litigation Problems (Validity and Inequitable Conduct)	40.4%	6.7%	19.5%
Alternative May Cause Estoppel and Narrow Claim Scope	6.4%	71.1%	1.3%
In the Aftermath of KSR, Nonobviousness is More Difficult to Prove	0.0%	1.3%	3.9%
Alternative is a Tacit Admission	6.4%	1.3%	7.8%
Alternative is Only a Last Resort	7.8%	0.0%	2.6%

Responders who preferred to assert first-inventor rights primarily mentioned the concern that distinguishing the prior art creates potential estoppel issues that would limit claim scope.[194] The following examples embody typical responses:

192. Four-hundred and forty-four (39%) of the 1141 responders offered some expositive statement explaining their strategy choice selection.

193. *See* NEUENDORF, *supra* note 172.

194. *See infra* app. 4.

> Swearing behind the reference limits the amount of prosecution history estoppel in the case and avoids making statements on the record that may later be used to limit the scope of the claims.[195]

> Why go on the record against your claims when you can make the prior art disappear?[196]

> It is crazy to make any substantive argument to distinguish over a reference that is not in fact prior art. Why limit the interpretation of your claims?[197]

Responders who preferred to distinguish the claimed invention from the prior art rather than assert first-inventor rights most often mentioned the concern that Rule 131 declarations create their own litigation problems by raising questions of invalidity and inequitable conduct.[198] The following examples embody typical responses:

> [Because] swearing back does not provide absolute victory (as a 102g date may later be found), I would always attempt to distinguish first, all other factors being equal.[199]

> I would prefer to avoid the risk of an unintentional error in the declaration. If discovered, it would raise inequitable conduct (perhaps groundless, but would still have to be defended) and raise a question of validity.[200]

> 131 declaration should be a last resort. [T]he resulting patent is weaker (creates [inequitable conduct] issues, defendants can

195. Response 804298036 to Dennis Crouch, Survey (on file with author).

196. Response 805007971 to Dennis Crouch, Survey (on file with author).

197. Response 804298036 to Dennis Crouch, Survey (on file with author).

198. *See infra* apps. 3–4. For representative cases involving allegations of inequitable conduct in connection with the filing of Rule 131 affidavits, *see*, *e.g.*, Greenwood v. Hattori Seiko Co., 900 F.2d 238, 241–42 (Fed. Cir. 1990) (reversing the district court's finding of inequitable conduct based on submission of a misleading Rule 131 affidavit, where the district court had made express finding of no intent to deceive); Timely Prod. Corp. v. Arron, 523 F.2d 288, 298 (2d Cir. 1975) (holding a patent unenforceable due to applicant's filing of a fraudulent Rule 131 affidavit).

199. Response 805122973 to Dennis Crouch, Survey (on file with author). The potential revival of art via 102(g) is discussed in S.F. Raizes, *Are Claims Obtained by the Use of Rule 131 Affidavits or Terminal Disclaimers Valid?—The Application of Section 102(g)*, 56 J. Pat. Off. Soc'y 699 (1974); *see also* Richard G. Berkley, Some Practical Aspects of Amendment Practice in the Electro-Mechanical Arts, 426 PLI/PAT 161, 213–214 (1995) (recommending that practitioners forego filing Rule 131 affidavits in favor of arguing patentability without conceding that the reference is prior art).

200. Response 804966046 to Dennis Crouch, Survey (on file with author).

> prove an earlier date, etc) plus it looks bad—as if you're admitting your claims are obvious over the cited reference.[201]

Many responders shared the concern that swearing behind a cited reference while failing to distinguish the claims on their merits "looks bad" and amounts to a tacit admission that the reference is good but for its effective date. Indeed, one self-described former examiner suggested that swearing behind a reference without addressing the scientific merits of the reference creates a specific challenge for a patent examiner—to find the same prior art, but with an earlier effective date:

> Swear[ing] behind the reference may satisfy some, but most [examiners] will try to thwart the swear behind by locating another, similar reference. Practically speaking, to get the case allowed, amend the claims minimally, distinguish from the prior art, and lastly swear behind it, in that order. This provides the examiner enough cover to allow the case.[202]

Some of the responders (12.2%) offered the reminder that patent prosecution is an ongoing process—a series of events or a story unfolding.[203] Many suggested that if one argument fails, an applicant should move to the next argument. However, many responders, who indicated that they would both assert first-inventor rights and distinguish the invention, suggested that the better approach is to include all arguments within a single response. The following examples embody typical responses:

> If you don't swear behind at the non-final stage the office will go final and not accept the 131 dec[laration] at that stage without the filing of a[Request for Continued Examination]. A similar situation arises if you rely on the dec[laration] and don't argue to distinguish. You'll have to file an RCE to get the arguments considered.[204]

> As an examiner, I can tell you this is the best way to get around the reference. More than likely one or the other submitted [sic] on its own will likely have some deficiency. Therefore, doing both will be more persuasive.[205]

201. Response 804891985 to Dennis Crouch, Survey (on file with author).
202. Response 804927752 to Dennis Crouch, Survey (on file with author).
203. Most prosecution histories include multiple iterations between the examiner and applicant offering both new arguments and nuances on previous arguments.
204. Response 804192506 to Dennis Crouch, Survey (on file with author).
205. Response 804497967 to Dennis Crouch, Survey (on file with author).

> Taking the "belt-and-suspenders" approach of both filing a 131 and distinguishing the claims saves time and money for my client. Just because the Examiner has cited a reference with a certain date does not mean that s/he cannot make another rejection based on other art that has an earlier date for the base reference. I prefer to be safe and plan for both eventualities, as long as the claim amendments do not drastically change the claim scope.[206]

Responders who indicated that they would both assert first-inventor rights and distinguish the invention most often mentioned that their approach increases the odds of obtaining patent protection.[207]

The cost of patent prosecution certainly drives some applicant behavior. There was some disagreement, however, on which choice was the least-cost mechanism. On one hand, 21.1% of responders who preferred to distinguish the invention suggested that their choice was at least partially driven by the high cost of preparing and filing a successful Rule 131 declaration:

> It generally costs much less to distinguish prior art than to do everything necessary to file a 131 Declaration.[208]

> Declarations are more work. Specifically, gathering facts related to conception + diligence or actual RTP is time consuming.[209]

> As a practical matter, it's often difficult to track down corporate-type inventors two or three years after the app is filed, so as to be able to get them to sign a Rule 131 dec[laration].[210]

A handful of responders who preferred to assert first-inventor rights indicated that was the cheaper approach:

> It is hard to justify to the client doing all the extra work of distinguishing the claims.[211]

Finally, 13.0% of responders who selected the dual strategy suggested that—in the long run—their approach was more cost-effective.

206. Response 804197733 to Dennis Crouch, Survey (on file with author).
207. Percentage of responders fitting this description: 33.8%.
208. Response 805531415 to Dennis Crouch, Survey (on file with author).
209. Response 806995065 to Dennis Crouch, Survey (on file with author).
210. Response 804343519 to Dennis Crouch, Survey (on file with author).
211. Response 805114796 to Dennis Crouch, Survey (on file with author).

> I would provide both arguments in order to minimize client costs and to minimize further PTO mailings and loss of time.[212]

5. Survey Conclusions

The survey results contrast somewhat with the analysis presented in Part II.A. It appears that the actual frequency of attempts to antedate references during prosecution is less than expected by practitioners in the field.[213] The discontinuous objective response criteria may have contributed to the discrepancy in result. For instance, even if a responder knew that exactly 0.7% of her cases included Rule 131 affidavits, it is unclear whether the responder would have chosen the "close to 0%" response or the "2%" response.

F. *Measuring the Success of Invention-Date-Based Rights Assertions Adjudged by the BPAI*

After being twice-rejected by a patent examiner, a patent applicant has a right to appeal to the USPTO's administrative court, the Board of Patent Appeals and Interferences ("BPAI"). The BPAI is an active court, which issues several thousand decisions each year.[214] To study BPAI decisions, we first used a broad search criterion of BPAI decisions in Westlaw.[215] The resulting decisions were reviewed to identify whether the BPAI made a decision regarding an attempt to antedate one or more references.

We identified 73 BPAI decisions that adjudged the merits of an attempt to antedate.[216] As shown in Table 13, the BPAI rejected the attempt to antedate in 77% (56) of these decisions, accepted the attempt to antedate in 22% (16), and partially accepted and partially rejected the attempt to antedate in 1% (1).[217]

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212. Response 804718925 to Dennis Crouch, Survey (on file with author). *See also* Response 804197733, *supra* note 222.

213. *Compare* accompanying text, *supra* note 75 (suggesting that only 0.7% of non-provisional utility applications filed between 2000 and 2007 included a Rule 131 affidavit asserting first-inventor rights), *with supra* tbl.7 (reporting average practitioner estimate that 2.7% of non-provisional utility applications include a Rule 131 affidavit asserting first-inventor rights).

214. Crouch, *supra* note 70.

215. Federal Intellectual Property—Board of Patent Appeals and Interferences Decisions (FIP-BPAI) Database, Thomson Reuters/West, *available at* http://www.westlaw.com. Search string: ("37 cfr 1.131" "swear behind" antedat! (date /2 invent!) (date /3 (conception! conceiv!)) (reduc! /3 practice) & ti("ex parte")).

216. Remands for insufficient briefing were not tabulated.

217. For the lone partial rejection, *see Ex parte* Cho, Appeal No. 2008-1739, 2009 WL 64619 (B.P.A.I. Jan. 12, 2009) (holding that the patent applicant had not antedated the reference with respect to Internet address limitations but had antedated the reference with respect to other recited limitations).

TABLE 13
SUMMARY OF BPAI DECISIONS ON ATTEMPTS TO ANTEDATE

Decision on Attempt to Antedate	Count	Percent
Affidavit Accepted	16	22%
Affidavit Rejected	56	77%
Partially Accepted and Partially Rejected	1	1 %

In each rejected case, the applicant had filed a Rule 131 declaration,[218] but the BPAI rejected those declarations for a variety of reasons, including insufficient evidence to establish reduction to practice prior to the effective date,[219] insufficient evidence to prove conception and/or

218. *But see Ex parte* Reuning, Appeal No. 2006-0580, 2007 WL 1813753 (B.P.A.I. June 25, 2007) (denying a rehearing because the appellant did not present the declaration with the brief), *vacated in part*, 276 F. App'x 983 (Fed. Cir. 2008).

219. *See Ex parte* Knaus, Appeal No. 2007-4016, 2009 WL 1878041 (B.P.A.I. June 29, 2009) (holding that the declarations were insufficient in character and weight as to establish reduction to practice prior to the effective dates of the other references); *Ex parte* Molander, Appeal No. 2008-2589, 2009 WL 726751 (B.P.A.I. Mar. 17, 2009) (holding that the applicant's declaration failed to show both conception and reduction to practice); *Ex parte* Saito, Appeal No. 2008-5777, 2008 WL 5371879 (B.P.A.I. Dec. 22, 2008) (holding that the applicant's declaration failed to show reduction to practice); *Ex parte* Satchell, Appeal No. 2008-0071, 2008 WL 4828136 (B.P.A.I. Nov. 6, 2008) (holding that the applicant's declaration failed to show reduction to practice); *Ex parte* Yao, Appeal No. 2008-3285, 2008 WL 4190000 (B.P.A.I. Sept. 11, 2008) (holding that the appellants had not met their burden of supplying a sufficient factual basis to establish that they reduced to practice or had possession of the broadly-claimed genus prior to the effective date of the reference); *Ex parte* Barber, Appeal No. 2008-3284, 2008 WL 4143435 (B.P.A.I. Sept. 4, 2008) (holding that the applicant did not establish reduction to practice or due diligence from the time of conception to the reduction to practice or filing of the patent application); *Ex parte* Rhoades, Appeal No. 2007-1611, 2008 WL 2200065 (B.P.A.I. May 28, 2008) (holding that the applicant's declaration failed to show reduction to practice.); *Ex parte* Henry, Appeal No. 2007-2777, 2008 WL 761095 (B.P.A.I. Mar. 21, 2008) (holding that the applicant's declaration failed to show both conception and reduction to practice); *Ex parte* Jung, Appeal No. 2007-2283, 2007 WL 4137539 (B.P.A.I. Nov. 20, 2007) (holding that the applicant's declaration failed to show reduction to practice); *Ex parte* Schatz, Appeal No. 2007-1335, 2007 WL 2814106 (B.P.A.I. Sept. 21, 2007) (holding that the applicant could not antedate a prior art reference with a Rule 131 declaration citing constructive reduction to practice in a previously filed, co-pending application because the instant application was not entitled to the benefit of the previously-filed application's filing date under 35 U.S.C. § 120); *Ex parte* Jackson, Appeal No. 2007-2532, 2007 WL 2382020 (B.P.A.I. Aug. 20, 2007) (holding that the applicant's declaration failed to show conception and actual reduction to practice); *Ex parte* Jameson, Appeal No. 2006-1699, 2006 WL 3448636 (B.P.A.I. Nov. 15, 2006) (holding that the applicant's declaration failed to show conception and reduction to practice); *Ex parte* Tracy, Appeal No. 2002-0913, 2002 WL 33948411 (B.P.A.I. Dec. 12, 2002) (holding that the applicant's declaration failed to show reduction to practice); *Ex parte* Ragan, Appeal No. 1997-2246, 2002 WL 31234513 (B.P.A.I. 2002) (holding that the applicant's declaration failed to show either diligence or reduction to practice); *Ex parte* Prywes, Appeal No. Appeal No 1995-0423, 1995 WL 1718843 (B.P.A.I. 1995) (holding that the applicant's declaration failed to show either diligence or reduction to practice); *Ex parte* Dunne, 20 U.S.P.Q.2d 1479 (B.P.A.I. 1991) (holding that the applicant's declaration failed to show reduction to practice); *Ex parte* Kitamura, 9 U.S.P.Q.2d 1787

reasonable diligence toward reduction to practice,[220] failure to assert conception of the entire claimed invention,[221] failure to prove prior conception of the elements taught in a reference,[222] failure to show country of invention,[223] failure to include signatures of all listed inventors,[224] fail-

(B.P.A.I. 1988) (holding that the applicant's declaration failed to show reduction to practice); *cf.* Gholz, *supra* note 23, at 181 ("An actual reduction to practice requires construction of the claimed invention even if the invention is simple.").

220. *See Ex parte* Das Sharma, Appeal No. 2009-0030, 2009 WL 1709135 (B.P.A.I. May 29, 2009) (holding that the applicant's declaration was insufficient to prove conception and diligent reduction to practice); *Ex parte* Hey, Appeal No. 2008-3614, 2008 WL 4752050 (B.P.A.I. Oct. 28, 2008) (holding that the applicant's declaration failed to show a date of invention prior to the reference); *Ex parte* Di Carlo, Appeal No. 2007-3016, 2008 WL 5583419 (B.P.A.I. Mar. 25, 2008) (holding that the applicant's declaration failed to show date of conception prior to the reference); *Ex parte* Mostafazadeh, Appeal No. 2007-4270, 2008 WL 544097 (B.P.A.I. Feb. 28, 2008) (holding that the applicant's declaration failed to show the requisite diligence); *Ex parte* Bianchi, Appeal No. 2007-2938, 2008 WL 227982 (B.P.A.I. Jan. 28, 2008) (holding that the applicant's declaration failed to show conception); *Ex parte* Krimm, Appeal No. 2007-2003, 2007 WL 2228672 (B.P.A.I. Aug. 3, 2007) (holding that the applicant's declaration contained no evidence of which country the invention was made in and no evidence of diligence); *Ex parte* Global Patent Holdings, L.L.C., Appeal No. 2006-0698, 2006 WL 3824921 (B.P.A.I. Apr. 5, 2006) (holding that the applicant's declaration failed to show conception and diligence); *Ex parte* Perry, Appeal No. 2001-0238, 2004 WL 77083 (B.P.A.I. 2004); *Ex parte* Hwang, Appeal No. 2002-2055, 2003 WL 25283829 (B.P.A.I. Aug. 29, 2003) (holding that the applicant's declaration failed to show diligence); *Ex parte* Kirkwood, Appeal No. 2002-0405, 2003 WL 23014530 (B.P.A.I. 2003); *Ex parte* Karpen, Appeal No. 2001-1918, 2003 WL 25277976 (B.P.A.I. Mar. 24, 2003) (holding that the applicant's declaration failed to show conception prior to the reference); *Ex parte* Igelmund, Appeal No. 1999-0653, 1999 WL 33291408 (B.P.A.I. 1999); *Ex parte* Hyatt, Appeal No. 1998-1913, 1999 WL 33206107 (B.P.A.I. Feb. 8, 1999) (holding that the applicant's declaration failed to show conception and diligence); *Ex parte* Peppel, Appeal No. 1998-2848, 1998 WL 1766687 (B.P.A.I. 1998) (holding that the applicant's declarations did not establish conception of the claimed invention coupled with diligence to the filing date); *Ex parte* Wilk, Appeal No. 1997-0939, 1997 WL 1948973 (B.P.A.I. 1997) (holding that the applicant's declaration failed to show diligence).

221. *See Ex parte* Draper, Appeal No. 2008-4038, 2009 WL 1007622 (B.P.A.I. Apr. 14, 2009); *Ex parte* Reuning, Appeal No. 2006-0580, 2007 WL 1813753 (B.P.A.I. June 25, 2007; *Ex parte* Peppel, Appeal No. 1998-2848, 1998 WL 1766687 (B.P.A.I. 1998) (holding that the applicant's declaration covered somewhat different claims).

222. *See Ex parte* Cho, Appeal No. 2008-1739, 2009 WL 64619 (B.P.A.I. Jan. 12, 2009); *Ex parte* Spencer, Appeal No. 2007-0082, 2007 WL 2814095 (B.P.A.I. Sept. 25, 2007).

223. *Ex parte* Krimm, Appeal No. 2007-2003, 2007 WL 2228672 (B.P.A.I. Aug. 3, 2007). For a discussion of invention country requirements, *see supra* pt. II.

224. *Ex parte* Li, Appeal No. 2009-1605, 2009 WL 1796049 (B.P.A.I. June 22, 2009); *Ex parte* Horn, Appeal No. 2007-3908, 2008 WL 194237 (B.P.A.I. Jan. 23, 2008) (finding the applicant's declaration inadequate because it was signed only by one of the inventors, failed to show reduction to practice, and failed the antedate the reference); *Ex parte* Woodruff, Appeal No. 2001-1055, 2003 WL 25277886 (B.P.A.I. Sept. 30, 2003) (finding the applicant's declaration inadequate because it was signed by only one inventor). *But see* Brief of Appellee Macdermid Printing Solutions, L.L.C., E.I. du Pont de Nemours & Co. v. MacDermid Printing Solutions, L.L.C., 525 F.3d 1353 (Fed. Cir. 2008) (No. 07-1568) (noting that the USPTO had accepted DuPont's Rule 131 declaration even though it "was not signed by all parties, and thus failed to comply with 37 C.F.R. § 1.131").

ure to allege a sufficiently early conception date,[225] failure to properly explain submitted evidence,[226] attempt to antedate a reference that qualifies as a statutory bar under § 102(b),[227] claims to the same invention as the prior art (thus necessitating an interference proceeding),[228] failure to properly submit the affidavit,[229] and an attempt to double-patent.[230]

One survey respondent expressed this difficulty in a comment:

> It is extremely difficult to get a 1.131 declaration accepted. One nearly needs to justify each day. Personally, I think it would be close to impossible to antedate over 6 months based upon constructive reduction to practice. If it is more than 2 months, I would probably be a waste of the client's money to try.[231]

225. *See Ex parte* Beanstalk Ventures Co., Appeal No. 2008-4348, 2009 WL 1707156 (B.P.A.I. May 29, 2009); *Ex parte* Lai, No. 2009-00007, 2009 WL 160232 (B.P.A.I. Jan. 21, 2009); *Ex parte* Hey, Appeal No. 2008-3614, 2008 WL 2951731 (B.P.A.I. July 31, 2008). Typically, an applicant fails to allege a sufficiently early conception date when the asserted reference is prior art under 35 U.S.C. § 102(e), and the court finds that the reference enjoys the benefit of a parent application's filing date. *See Ex parte* Yamaguchi, 88 U.S.P.Q.2d 1606 (B.P.A.I. 2008)(holding that a provisional application is considered an "application for patent" within the meaning of § 102(e)).

226. *See Ex parte* Daniels, Appeal No. 2008-0568, 2009 WL 1683017 (B.P.A.I. May 20, 2009) (holding that the applicant's Rule 131 affidavit failed to sufficiently explain the content of the project documents or how the information therein established reduction to practice or conception and diligent reduction to practice); *Ex parte* Kern, Appeal No. 2008-0495, 2008 WL 867822 (B.P.A.I. Mar. 28, 2008) (rejecting the applicant's declaration because it made no attempt to correlate the evidence of conception with the limitations of the claims).

227. *See Ex parte* Zaromb, Appeal No. 1996-1556, 1999 WL 33291391 (B.P.A.I. Dec. 9, 1999) (holding that the applicant could not use a Rule 131 declaration to swear behind a § 102(b) reference); *Ex parte* Alleman, Appeal No. 1996-2121, 1996 WL 1749143 (B.P.A.I. 1996); *Ex parte* Scott, Appeal No. 1996-1931, 1996 WL 1749114 (B.P.A.I. 1996).

228. *See Ex parte* Hottovy, Appeal No. 2008-5794, 2008 WL 5417239 (B.P.A.I. Dec. 29, 2008) (holding that the applicant's Rule 131 declaration was invalid because the application and the reference claimed the same patentable invention, and priority could only be established through an interference proceeding); *Ex parte* Zacharias, Appeal No. 2002-0741, 2002 WL 32346094 (B.P.A.I. Nov. 6, 2002); *Ex parte* Blalock, Appeal No. 1999-2347, 2002 WL 33952591 (B.P.A.I. Apr. 23, 2002) (holding that the applicant's Rule 131 declaration was invalid because the application and the reference claimed the same patentable invention, and priority could only be established through an interference proceeding); *Ex parte* Clark, Appeal No. 1996-2058, 1996 WL 33120499 (B.P.A.I. 1996) (holding that the applicant's declaration was ineffective because the application and the reference were claiming the same invention); *Ex parte* Standish, 10 U.S.P.Q.2d 1454 (B.P.A.I. 1988) (holding that the applicant's Rule 131 declaration was invalid because the application and the reference claimed the same patentable invention, and priority could only be established through an interference proceeding).

229. *See Ex parte* Reuning, Appeal No. 2006-0580, 2007 WL 1813753 (B.P.A.I. June 25, 2007) (denying the applicant's appeal because the applicant did not present the declaration with the brief).

230. *See Ex parte* Karn, Appeal No. 1998-1664, 2002 WL 87933 (B.P.A.I. 2002) (holding that obviousness-type double patenting barred the applicant from antedating a reference).

231. Response 804529601 to Dennis Crouch, Survey (on file with author).

G. *Use of First-Inventor Rights During Interference Proceedings*

This Article focuses on *ex parte* prosecution proceedings. However, because *inter partes* interference proceedings are so intertwined with proposals for patent reforms that would eliminate the invention-date-based novelty rights, they bear at least some mention.[232] Interference proceedings are exceedingly rare.[233] In FY 2009, the USPTO declared fifty-five interference proceedings.[234] In FY 2008, the USPTO declared only sixty-six.[235] This FY 2008 figure would represent less than 0.02% of the nearly 400,000 patent application disposals in FY2008.[236] Moreover, the late-filer attempting to claim priority based on prior invention usually loses to the first-to-file.[237]

232. Interference proceedings are defined under 35 U.S.C. 135(a), and their procedure is spelled out in MPEP, *supra* note 15, at § 2300. "Interfering subject matter" exists when an applied-for claim—if prior art—would "have anticipated or rendered obvious the subject matter of a claim of the opposing party *and* vice versa." Christian J. Garascia, *Evidence of Conception in U.S. Patent Interference Practice: Proving Who is the First and True Inventor*, 73 U. DET. MERCY L. REV. 717, 719–26 (1996).

233. The rarity of interferences is well-understood because interference statistics have been available for some time. *See* George E. Frost, *The 1967 Patent Law Debate: First-to-Invent vs. First-to-File*, 1967 DUKE L.J. 923 (1967); Gholz, *supra* note 18; Michael Martin, *The End of the First-to-Invent Rule: A Concise History of its Origin*, 49 IDEA 435 (2009); Donald W. Banner, *Patent Law Harmonization*, 1 U. BALT. INTELL. PROP. L.J. 9 (1992); AMERICAN INTELLECTUAL PROPERTY LAW ASSOCIATION, A GUIDE TO PATENT LAW HARMONIZATION TOWARDS A MORE INVENTOR-FRIENDLY WORLDWIDE PATENT SYSTEM § 4 (1996), http://www.aipla.org/harmoniz.html (estimating that 99.95% of patents are issued to the first inventor to file an application claiming a given innovation); LERNER, *supra* note 108, at 6 ("Thus, the U.S. persists in this complex, costly, and idiosyncratic system in order to reverse the priority of 0.03% of the patent applications filed each year.").

234. UNITED STATES PATENT AND TRADEMARK OFFICE BOARD OF PATENT APPEALS AND INTERFERENCES PROCESS PRODUCTION REPORT, FISCAL YEAR 2009, http://www.uspto.gov/web/offices/dcom/bpai/docs/process/fy2009.htm; *see also* Ian A. Calvert & Michael Sofocleous, *Interference Statistics for Fiscal Years 1989 to 1991*, 74 J. PAT. & TRADEMARK OFF. SOC'Y 822 (1992).

235. UNITED STATES PATENT AND TRADEMARK OFFICE BOARD OF PATENT APPEALS AND INTERFERENCES PROCESS PRODUCTION REPORT, FISCAL YEAR 2008, http://www.uspto.gov/web/offices/dcom/bpai/docs/process/fy2008.htm.

236. A patent application disposal is counted when a patent application either issues as a patent or is abandoned. In FY 2008, the USPTO reported 396,228 patent application disposals. USPTO PERFORMANCE AND ACCOUNTABILITY REPORT FOR FY2008 tbl.1, http://www.uspto.gov/web/offices/com/annual/2008/2008annualreport.pdf.

237. *See* Edwards v. Strazzabosco, 58 U.S.P.Q.2d 1836, 1840 (B.P.A.I. 2001) (noting an approximately 75% success rate for the first-to-file); Charles Macedo, *First-to-File: Is American Adoption of the International Standard in Patent Law Worth the Price?*, 1988 COLUM. BUS. L. REV. 543 (1990); Mossinghoff, *supra* note 23, at 427 (stating that between 1983 and 2000, the first-to-file won 1917 of the 2858 interference cases). *But see* Gholz, *supra* note 23, at 181 (reporting that USPTO data suggests that the first-to-file has recently been winning in only 52.5% of the cases).

By the end of FY 2009, only forty-four interference proceedings were pending, down from fifty-two at the end of FY 2008.[238] On average, the interference proceedings begin and end within a year. For the first three quarters of FY 2009, terminated interference proceedings averaged 10.6 months pendency with 93.9% terminated in less than two years.[239]

DISCUSSION AND CONCLUSIONS

Very few patent applicants successfully assert invention-date-based novelty rights during patent prosecution. Of course, that statistic alone does not resolve the question of whether the United States should retain its unique system that allows for an invention date focus. To the contrary, the relatively minor administrative burden of judging the quality of Rule 131 affidavit submissions suggests that the novelty provisions may be an appropriate safety valve to avoid the potential harsh result of a delay in filing a patent application. This administrative burden appears especially small when compared with the efforts required to conduct an interference proceeding or even to determine the patentability of a claimed invention.[240] In any event, the USPTO could impose a fee in connection with Rule 131 affidavit filings, as it does with Section 8 affidavit practice in trademark law. On the other hand, assuming that small entities are more fee-sensitive than large entities, the imposition of a fee requirement would further reduce the relative value of potential invention-date-based rights for those applicants.

The U.S. novelty rules have previously been thought to preferentially benefit independent inventors, new entrants, and basic researchers. The evidence presented here does not support that conclusion. However, it is important to recognize that the assertion of invention-date-based novelty rights is not a zero-sum game or a David-versus-Goliath competition. Rather, the fact that large companies assert their novelty rights does not necessarily diminish the value of patent rights held by other entities.[241] Thus, small entities may still reap benefits from their invention date rights even though large companies reap *more* benefits. Indeed,

238. UNITED STATES PATENT AND TRADEMARK OFFICE BOARD OF PATENT APPEALS AND INTERFERENCES PROCESS PRODUCTION REPORT, FISCAL YEAR 2009, *supra* note 234.

239. BOARD OF PATENT APPEALS AND INTERFERENCES PERFORMANCE MEASURES, http://www.uspto.gov/web/offices/dcom/bpai/docs/perform/fy2009b.htm.

240. Gholz, *supra* note 18, at 891 (estimating the private cost of an interference proceeding at over $100,000).

241. A patent is an exclusive grant and does impact the rights of the rest of the population. However, a general argument against patent rights does not address the specific question of whether invention-date-based novelty rights offer social value.

conflicting rights are least likely in the most common cases: where a prior art reference is applied as one part of an obviousness analysis.

In addition to public administrative costs, patent applicants hoping to prove their invention date face the private cost of maintaining sufficient records. However, those costs are associated with a purely private choice. As discussed in Part II, the U.S. system defaults to a filing-date focus, thus providing applicants with a choice. Those whose private costs of compliance are too great can settle for the default.

The results detailed in the Article show that non-U.S. entities are the least likely of any group studied to assert invention-date-based novelty rights.[242] Although the law no longer differentiates based on the location of an invention,[243] the patenting culture may not have shifted, even though U.S. patent filings by non-U.S. entities are at an all-time high, and more non-U.S. entities file for protection in the United States than in any other country around the world.[244] U.S. entities likewise file more patent applications outside of their home country than do entities from any other country.[245] Thus, it appears that the lack of a uniform rule on invention-date-based novelty rules is not substantially deterring applicants from taking advantage of rights outside of their home country.

The most concerning issues associated with invention-date-based novelty rights involve the fuzzy patent grant and information asymmetry. A third party considering the validity of a U.S. patent typically does not have information regarding the invention date and consequently cannot know whether apparent prior art would be antedated in a later trial or reexamination. The statutory bar of § 102(b) mitigates the problem by creating a clear demarcation for public information available more than one year before the patent's filing date. However, as discussed in Part II.C, a substantial portion of relevant prior art does not trigger the statutory bar. Thus, manufacturers conducting freedom-to-operate or infringement analyses are left merely to speculate on the potential invention date that might later be proven.

The fuzzy boundary is present with respect to almost every issued U.S. patent, and supporters of filing-date-only rights consider this to be one of their strongest talking points. Ironically, in the present system, the fuzzy boundary in issued patents is most clearly eliminated when the applicant has submitted a Rule 131 affidavit with invention date evidence during prosecution. In those cases, the applicant has identified a prior invention date. In this light, the rules of proving a date of invention

242. *See supra* pt. II.A.

243. So long as the invention was created in one of the 150+ NAFTA or WTO countries.

244. WORLD PATENT REPORT: A STATISTICAL REVIEW (2008), http://www.wipo.int/ipstats/en/statistics/patents/wipo_pub_931.html.

245. *Id.*

during patent prosecution might be seen as unduly strict whereas a more liberal approach could help solve the later-felt information gap. There are other creative solutions available. The USPTO could require applicants to submit invention date information in order to preserve rights or alternatively require applicants to submit a fee in order to preserve prior-inventor rights. These approaches should likely be rejected because of their added complication and up-front costs to applicants—both of which tend to have a greater negative impact on small entities. To answer these questions, I suggest a follow-on project studying post-grant assertions of invention-date-based novelty rights for cases involved in patent litigation and reexamination.

Although invention-date-based novelty rights are typically associated with a first-to-invent priority system, a final purpose of this paper is simply to highlight the distinction between these two aspects of the U.S. patent system. Although both stem from similar policy goals, their modification in proposed legislation should be separately justified. In particular, elimination of the priority contests outlined in § 102(g) (i.e., first-to-invent rights) need not alter the ability to antedate third-party prior art.