

JUDGING PATENTS

SAPNA KUMAR*

ABSTRACT

Patent litigation is regarded as the “neurosurgery of litigation.” To adjudicate these cases, judges must grasp complex technology underlying the claims at issue, notwithstanding the fact that many judges lack relevant science or technology backgrounds. This problem is compounded by the fact that judges generally lack access to neutral expertise, forcing them to rely upon party-hired experts for tutorials. By contrast, several European patent courts utilize technically qualified judges who work side by side with their legally trained counterparts to decide patent cases. The integration of technical expertise into the judiciary improves the speed of litigation, provides the court with unbiased information, and likely increases the accuracy of the judges’ claim construction. This Article examines the role of technical expertise in patent litigation and discusses obstacles to U.S. district courts obtaining assistance. It then looks at the use of technically qualified judges in Germany and Switzerland, as well as in the European Union’s proposed Unified Patent Court, and it

* Law Foundation Professor of Law, University of Houston Law Center. The author would like to thank Suelen Carls, Rochelle Dreyfuss, Becky Eisenberg, Dave Fagundes, Susy Frankel, Christophe Geiger, Dietmar Harhoff, Mark Janis, Marshall Leaffer, Matthias Leistner, Zahr Said, Xavier Seuba, Janewa Osei-Tutu, and Greg Vetter for their helpful comments. She would also like to thank the participants of the Max Planck Institute for Innovation and Competition’s Patentrechtszyklus, the 2019 ATRIP conference, the University of Michigan Law School Intellectual Property Workshop, the Indiana University Mauer School of Law Intellectual Property Colloquium, the Indiana University McKinney School of Law Distinguished Lecture Series, and the M3 Intellectual Property Scholarship Workshop.

This project was made possible by a Fulbright-Schuman Innovation Grant, which was jointly financed by the U.S. State Department and the Directorate-General for Education and Culture of the European Commission. The grant enabled the author to spend five months researching at the Max Planck Institute for Innovation and Competition in Germany and the University of Strasbourg’s Center for International Intellectual Property in France.

discusses advantages and disadvantages of their use. The Article finally proposes increasing technical expertise in the U.S. judiciary by utilizing technically trained judges or staff. It further suggests streamlining all U.S. patent litigation into a group of urban district courts, which could employ neutral technical experts.

TABLE OF CONTENTS

INTRODUCTION	874
I. EVALUATING JUDICIAL SPECIALIZATION	878
A. <i>Specialization in the Judiciary</i>	879
1. <i>Types of Specialization</i>	879
2. <i>Benefits and Risks of Specialization</i>	881
B. <i>The Role of Generalist District Courts in Patent Litigation</i>	884
II. TECHNICAL EXPERTISE OF U.S. JUDGES	888
A. <i>Party-Hired Experts</i>	888
B. <i>Law Clerks</i>	892
C. <i>Court-Appointed Experts and Advisors</i>	893
1. <i>Technical Advisors</i>	894
2. <i>Neutral Testifying Experts Under Federal Rule of Evidence 706</i>	899
3. <i>Special Masters</i>	900
III. EUROPE'S TECHNICALLY QUALIFIED JUDGES	902
A. <i>European Courts Utilizing Technically Qualified Judges</i>	903
1. <i>The German Federal Patent Court</i>	903
2. <i>The Swiss Federal Patent Court</i>	906
3. <i>The Unified Patent Court</i>	909
B. <i>Benefits and Drawbacks of Technically Trained Judges in Patent Litigation</i>	912
IV. INTEGRATING TECHNICAL SPECIALIZATION INTO THE U.S. JUDICIAL SYSTEM	916
A. <i>Technically Trained Magistrate Judges</i>	918
B. <i>Technically Trained Staff</i>	922
C. <i>Restructuring the District Court System for Patent Litigation</i>	923
CONCLUSION	927

INTRODUCTION

Patent infringement disputes are among the most challenging cases brought in federal district court. Judges admittedly disagree regarding whether the underlying legal principles are especially difficult,¹ or whether the law poses challenges to judges because they infrequently encounter patent cases and are unfamiliar with the relevant case law.² But there is general agreement that patent cases force judges to grapple with unfamiliar technology,³ leading at least one judge to dub patent cases “the neurosurgery of litigation.”⁴ District judges generally lack scientific backgrounds and are ill-equipped to understand the technical issues that arise in these cases.⁵ This makes it challenging for them to accurately construe claims and to properly tailor general patent law doctrines to specific technology.⁶

1. Compare Kathleen M. O'Malley, Patti Saris & Ronald H. Whyte, *A Panel Discussion: Claim Construction from the Perspective of the District Judge*, 54 CASE W. RESV. L. REV. 671, 682 (2004) (observing that patent litigation “is hard legally” (remarks of Hon. Patti Saris)), with Diane P. Wood, *Keynote Address: Is It Time to Abolish the Federal Circuit's Exclusive Jurisdiction in Patent Cases?*, 13 CHI.-KENT J. INTEL. PROP. 1, 7 (2013) (maintaining that “the basic legal principles” of patent law “are relatively straightforward”).

2. See James F. Holderman, *Judicial Patent Specialization: A View from the Trial Bench*, 2002 U. ILL. J.L. TECH. & POL'Y 425, 429 (observing that district judges who do not hear many patent cases must “brush up” on the relevant case law when confronted with a patent case); see also Arti K. Rai, *Engaging Facts and Policy: A Multi-Institutional Approach to Patent System Reform*, 103 COLUM. L. REV. 1035, 1097 (2003) (noting that “the typical district judge” is unlikely to “see more than a few patent cases over the course of her tenure”).

3. See Holderman, *supra* note 2, at 429, 431-32 (discussing how patent cases require judges to devote time to learning unfamiliar technology and Federal Circuit case law); O'Malley et al., *supra* note 1, at 682 (noting that patent litigation “is hard scientifically” (remarks of Hon. Patti Saris)); Wood, *supra* note 1, at 7 (“[P]atent claims may involve very complicated technology.” (emphasis removed)).

4. O'Malley et al., *supra* note 1, at 682 (remarks of Hon. Patti Saris).

5. See *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 993 (Fed. Cir. 1995) (Mayer, C.J., concurring) (“[T]here is simply no reason to believe that judges are any more qualified than juries to resolve the complex technical issues often present in patent cases.”); Kimberly A. Moore, *Are District Court Judges Equipped to Resolve Patent Cases?*, 15 HARV. J.L. & TECH. 1, 38 (2001) (“The 33% reversal rate of district court claim constructions suggests that judges are not, at present, capable of resolving these issues with sufficient accuracy.”).

6. Jeanne C. Fromer, *District Courts as Patent Laboratories*, 1 U.C. IRVINE L. REV. 307, 315 (2011) (observing that district judges’ lack of relevant technical background makes it “hard for them to understand often complex patented technologies and the industries in which they occur”).

Judicial expertise and specialization are multidimensional, encompassing legal and technical knowledge.⁷ Under the current system, some judges possess legal expertise with regard to patent law, given that 61 percent of new patent cases are filed in just five district courts.⁸ At the appellate level, the U.S. Court of Appeals for the Federal Circuit is legally specialized, with patent cases accounting for 63 percent of its docket and roughly 80 percent of its time.⁹

Technical expertise among judges, however, is minimal. At the Federal Circuit, only five of the twelve current judges have science-related degrees,¹⁰ and case assignments are not made based on those backgrounds.¹¹ Although it is unclear how many district judges have technical training, they are expected to be generalists and are not appointed for any specialized knowledge.¹² Some evidence suggests that the Federal Circuit values fact-finding from technically trained judges, but this approach currently exists only with the administrative judges of the Patent Trial and Appeal Board (PTAB).¹³

To decide patent cases, judges must compensate for their lack of expertise. Many Federal Circuit judges and some district judges

7. See Chad M. Oldfather, *Judging, Expertise, and the Rule of Law*, 89 WASH. U. L. REV. 847, 851 n.11, 853 (2012) (observing that judicial expertise can be “multi-dimensional,” encompassing the judge’s background, subject matter expertise, judicial experience, and the like).

8. PATENT CASES FILED BY YEAR: PAST 10 YEARS, LEXMACHINA (report on file with author).

9. See Timothy B. Dyk, *Thoughts on the Relationship Between the Supreme Court and the Federal Circuit*, 16 CHI.-KENT J. INTELL. PROP. 67, 77-78 (2016) (discussing how in 2016 patent litigation comprised 63 percent of the Federal Circuit’s docket and “probably on the order of 80” percent of the court’s time).

10. See *Judges*, U.S. CT. OF APPEALS FOR THE FED. CIR., <http://www.cafc.uscourts.gov/judges> [<https://perma.cc/FTY7-PJYV>] (providing biographies for the current Federal Circuit judges).

11. Cases are randomly assigned to a panel of three judges. See generally *Court Jurisdiction*, U.S. CT. OF APPEALS FOR THE FED. CIR., <http://www.cafc.uscourts.gov/the-court/court-jurisdiction> [<https://perma.cc/VR9G-LECY>].

12. See Rai, *supra* note 2, at 1046 (observing that a “typical judge” is not a person having “ordinary skill” in a particular art and is consequently “not likely to be endowed with the appropriate technical knowledge”).

13. In an empirical study, Matthew Sipe observed that “the Federal Circuit appears to be placing greater faith in the scientific expertise of its administrative patent judges” compared to the legal specialization from courts such as the Eastern District of Texas. Matthew G. Sipe, *Experts, Generalists, Laypeople—and the Federal Circuit*, 32 HARV. J.L. & TECH. 575, 578 (2019).

hire law clerks with science or engineering degrees to provide assistance,¹⁴ and rarely, a judge will employ a neutral expert to assist with a complex case.¹⁵ But far more frequently, party-hired experts explain the relevant technology to judges through tutorials and briefs, leaving judges with the responsibility of sifting through divergent accounts.¹⁶

By contrast, several European countries utilize technically trained judges for some or all patent cases.¹⁷ In Germany, for patent invalidation proceedings and patent office appeals, panels include both legally qualified judges (LQJs) and technically qualified judges (TQJs), with the TQJs hearing cases only in their area of technical expertise.¹⁸ Switzerland relies primarily on part-time TQJs, who also work as patent attorneys and are assigned to panels (and paid) on a case-by-case basis.¹⁹ And if ratified, the proposed Unified

14. See Moore, *supra* note 5, at 18 (noting that Federal Circuit judges “generally hire law clerks with various technical backgrounds to assist them with their cases”).

15. See *infra* Part II.C.

16. See *infra* Part II.A.

17. In addition to the courts discussed at length in this article, Denmark, Hungary, and Sweden utilize technical judges in at least some patent litigation. See *Patent Enforcement Through the Courts in Denmark*, LEXOLOGY (Jan. 25, 2019), <https://www.lexology.com/library/detail.aspx?g=6c35af53-1037-4cf8-b366-c683a87022ac> [<https://perma.cc/5FZS-EZ3F>] (noting that, in Denmark, “two technical judges and one legally trained judge (the president) participate in” adjudicating all patent cases); Árpád Pethő & Eszter Szakács, *Litigation and Eligibility: Hungary*, IAM (Apr. 11, 2019), <https://www.iam-media.com/litigation-and-eligibility-hungary> [<https://perma.cc/2FBB-QN54>] (explaining that in Hungary, the Metropolitan Tribunal has exclusive jurisdiction over patent cases and utilizes a “speciali[z]ed panel” with “a legal judge ... and two technical judges”); *Patent Enforcement Through the Courts in Sweden*, LEXOLOGY (Feb. 27, 2019), <https://www.lexology.com/library/detail.aspx?g=cf98c8bc-ec8d-403f-8fb3-12de0480d346> [<https://perma.cc/MZC7-AVSL>] (describing how, in Sweden, patent cases are “decided by one specialist judge, assisted by technically trained judges”). In Austria, patent infringement disputes are heard by a three-judge expert panel, in which two judges are legal experts in patent law, and one “lay judge” is technically qualified. Christian Gassauer-Fleissner, Dominik Göbel & Manuel Wegrostek, *Patent Litigation in Austria: Overview*, THOMSON REUTERS PRAC. L. (June 1, 2020), <https://uk.practicallaw.thomsonreuters.com/8-621-0663> [<https://perma.cc/H3M4-43FZ>]. The lay judge is typically an Austrian patent attorney with relevant technical expertise. Dominik Göbel, Manuel Wegrostek & Paul Reiter, *Patent Litigation 2020 Austria*, CHAMBERS & PARTNERS ¶ 2.4 (Feb. 10, 2020), <https://perma.cc/84YX-DP8Y>.

18. Beate Schmidt, *How to Improve the Quality of Decisions—Especially the Issue of the Composition of the Court*, in WHAT PATENT LAW FOR THE EUROPEAN UNION? 107, 110 (Christophe Geiger ed., 2012).

19. Andri Hess, *Switzerland*, in PATENT LITIGATION LAW REVIEW 275, 276 (Trevor Cook ed., 3d ed. 2019), <https://perma.cc/3L5Q-BGG6>.

Patent Court (UPC) would extend the use of TQJs to most of continental Europe.²⁰

In the current body of scholarship, much of what has been written regarding judicial specialization in patent law has focused on legal expertise. Several scholars, including this one, have argued that generalized courts are beneficial and have warned about the dangers of overspecialization in appellate patent law,²¹ while others maintain that such concerns may be overblown.²² A few scholars have called for a single specialized patent trial court.²³ But little attention has been paid to the merits of increasing technical specialization in existing district courts.²⁴

20. See *infra* Part III.A.3. Note that not all EU member states would be part of the UPC—Spain, Croatia, and Poland have declined to join. *Great Uncertainty, but Preparations for Unitary Patent System Continue*, WOLTERS KLUWER (Sept. 7, 2019), <http://patentblog.kluweriplaw.com/2019/09/07/great-uncertainty-but-preparations-for-unitary-patent-system-continue/> [<https://perma.cc/YD2G-TLBG>].

21. See, e.g., Rebecca S. Eisenberg, *A Functional Approach to Judicial Review of PTAB Rulings on Mixed Questions of Law and Fact*, 104 IOWA L. REV. 2387, 2405-15 (2019) (discussing the Federal Circuit's inadequate deference for PTAB fact-finding); Sapna Kumar, *Patent Court Specialization*, 104 IOWA L. REV. 2511, 2519-28, 2532 (2019) (observing that the Federal Circuit's specialization has given rise to numerous problems and arguing in favor of granting the PTO substantive rulemaking authority to serve as a counterbalance); Wood, *supra* note 1, at 9-10 (proposing an end to the Federal Circuit's exclusive jurisdiction); Rai, *supra* note 2, at 1088-89 (criticizing the Federal Circuit's lack of deference for district court fact-finding).

22. See, e.g., J. Jonas Anderson, *Reining in a "Renegade" Court: TC Heartland and the Eastern District of Texas*, 39 CARDOZO L. REV. 1569, 1617-18 (2018) (discussing how most scholars do not view the Federal Circuit as being captured, but arguing that the Eastern District of Texas has been captured); John M. Golden, *The Supreme Court as "Prime Percolator": A Prescription for Appellate Review of Questions in Patent Law*, 56 UCLA L. REV. 657, 660 (2009) ("The Federal Circuit's variegated docket, the diverse backgrounds of its judges, and its use of processes of judicial exchange whereby judges sit by designation mean that the Circuit is significantly less specialized and isolated than commonly supposed.").

23. See, e.g., Elizabeth Connors, Note, *Specializing District Courts for Patent Litigation*, 69 CASE W. RESV. L. REV. 771, 802-03 (2019) (proposing a single patent trial court with technically trained law clerks); Arti K. Rai, *Specialized Trial Courts: Concentrating Expertise on Fact*, 17 BERKELEY TECH. L.J. 877, 880 (2002) (maintaining that, despite the risk of capture and tunnel vision, a single patent trial court would be superior to the current system of semi-specialized trial courts); Kimberly A. Moore, *Forum Shopping in Patent Cases: Does Geographic Choice Affect Innovation?*, 79 N.C. L. REV. 889, 932-33 (2001) (maintaining that providing a patent trial court with exclusive jurisdiction would increase predictability of patent law, alleviate strain on district courts, and allow the judges to develop expertise).

24. *But see* David L. Schwartz, *Practice Makes Perfect? An Empirical Study of Claim Construction Reversal Rates in Patent Cases*, 107 MICH. L. REV. 223, 261 (2008) (noting that district courts could utilize judges with technical backgrounds or technical experts); Edward V. Di Lello, Note, *Fighting Fire with Firefighters: A Proposal for Expert Judges at the Trial*

This Article compares the technical expertise of U.S. judges with those of Germany, Switzerland, and the proposed UPC. It furthermore makes several proposals for increasing technical competence in the U.S. district courts. Part I considers the advantages and disadvantages of specialized courts and analyzes the role that district courts play in deciding patent cases. Part II then discusses the use of technical expertise in the U.S. patent system and examines how district judges educate themselves about technical issues that arise during litigation. Part III looks at Germany, Switzerland, and the proposed UPC's use of TQJs and examines the advantages and disadvantages of utilizing them.

Part IV then proposes methods of integrating greater technical expertise into district courts, given the structure of the U.S. federal court system. It proposes a trial in which Congress provides funds to district courts with large patent dockets to hire magistrate judges with technical backgrounds. It alternatively proposes that Congress fund a trial to enable courts to hire specialized staff to assist district judges. Finally, Part IV recommends that Congress consider streamlining all patent litigation into a group of urban district courts to facilitate the integration of technical expertise into the judiciary.

I. EVALUATING JUDICIAL SPECIALIZATION

Although specialized courts existed as early as 1792,²⁵ the U.S. federal judiciary remains largely a generalist system.²⁶ This is in contrast to countries that rely heavily on specialized courts or specialized chambers of general courts.²⁷ Section A provides a brief

Level, 93 COLUM. L. REV. 473, 498-99 (1993) (proposing the creation of permanent expert magistrate judges).

25. See Rochelle C. Dreyfuss, *Forums of the Future: The Role of Specialized Courts in Resolving Business Disputes*, 61 BROOK. L. REV. 1, 6 (1995) (discussing the formation of Delaware's Chancery Court).

26. *But see* Richard L. Revesz, *Specialized Courts and the Administrative Lawmaking System*, 138 U. PA. L. REV. 1111, 1111-12 (1990) (discussing exceptions to the generalized U.S. judiciary).

27. Germany, for example, has specialized courts for a variety of areas, including labor disputes, administrative law, social security, taxation, patents, and family law. See Jochen Lehmann, *Legal Systems in Germany: Overview*, THOMSON REUTERS PRAC. L. (Jan. 1, 2020), <https://uk.practicallaw.thomsonreuters.com/w-007-7132> [<https://perma.cc/Q6N7-PWAB>]

overview of the different types of judicial specialization and discusses their advantages and disadvantages. Section B then considers district courts' role in patent litigation and what kind of specialization might aid judges.

A. *Specialization in the Judiciary*

1. *Types of Specialization*

Although judicial specialization and expertise are often thought of as monolithic, this is not correct. Judges may become experts in a particular area of legal doctrine, such as tax.²⁸ They may become experts in cases relating to certain classes of technology,²⁹ such as judges in the District of New Jersey who hear a high concentration of pharmaceutical cases.³⁰ They may also have specialized knowledge in policy or in dealing with particular groups of people, such as children or drug offenders.³¹ Courts themselves may be specialized independently of the judges, such as by having rules of procedure tailored to a particular type of litigation.³² For example, the Eastern District of Texas developed procedural rules requiring the early

(discussing the structure of the German court system). Although patent litigation cases are heard by general regional courts, each regional court has at least one "patent chamber" that exclusively hears patent cases. Julia Schönbohm, Bolko Ehlgen & Natalie Ackermann-Blome, *Germany*, in PATENT LITIGATION LAW REVIEW, *supra* note 19, at 108, 110, <https://perma.cc/3L5Q-BGG6>.

28. See Oldfather, *supra* note 7, at 852-53 (discussing how expertise may be "subject-matter specific").

29. See Heike Gramckow & Barry Walsh, *Developing Specialized Court Services: International Experiences and Lessons Learned* 21 (World Bank Just. & Dev. Working Paper Series, Working Paper No. 81946, 2013), <http://documents.worldbank.org/curated/en/688441468335989050/developing-specialized-court-services-international-experiences-and-lessons-learned> [<https://perma.cc/J2NN-DCMN>] (discussing different types of judicial specialization).

30. See Jeanne C. Fromer, *Patentography*, 85 N.Y.U. L. REV. 1444, 1444, 1447-48, 1500, 1506 (2010) (discussing how New Jersey has an "industry cluster" of pharmaceutical cases and arguing that this natural clustering leads to districts that "tend to know more about the underlying technologies and industry conditions").

31. Gramckow & Walsh, *supra* note 29, at 14, 21.

32. See S. Jay Plager, *The United States Courts of Appeals, the Federal Circuit, and the Non-regional Subject Matter Concept: Reflections on the Search for a Model*, 39 AM. U. L. REV. 853, 858 (1990) (arguing that courts can be specialized independently of judges).

disclosure of infringement and invalidity contentions, which made the forum popular with patent holders.³³

Some experiments with specialization have occurred in the United States. For example, the Court of International Trade is an Article III court with trade-related expertise; it has exclusive jurisdiction over all antidumping and countervailing duties disputes, along with some other international trade-related cases.³⁴ It is structured more like an independent agency than a court, in that no more than five of its nine judges can be from the same political party.³⁵ Specialized judges also hear bankruptcy cases, but these judges were denied Article III status to avoid “dilut[ing] the significance, and prestige, of district judgeships.”³⁶

With regard to patent law, Congress has looked at ways to increase legal expertise. In 2011, Congress implemented a ten-year Patent Pilot Program, which involved fourteen participating courts.³⁷ Judges serving on participating courts have the option to decline to hear patent cases, which are then reassigned to “designated” judges who have opted into hearing more patent cases.³⁸ Although the trial is still ongoing, initial reports have been mixed: designated judges decided cases faster compared to nondesignated ones, but the appeals rate and reversal rate in the Federal Circuit have apparently stayed the same.³⁹

33. See Megan M. La Belle, *The Local Rules of Patent Procedure*, 47 ARIZ. STATE L.J. 63, 99-100 (2015).

34. See Eric J. Pan, *Assessing the NAFTA Chapter 19 Binational Panel System: An Experiment in International Adjudication*, 40 HARV. INT'L L.J. 379, 384 (1999).

35. See 28 U.S.C. § 251(a). This structure is similar to the independent International Trade Commission, in which no more than half of the commissioners may be from the same party. 19 U.S.C. § 1330(a).

36. See Troy A. McKenzie, *Judicial Independence, Autonomy, and the Bankruptcy Courts*, 62 STAN. L. REV. 747, 760-61 (2010) (quoting *Bankruptcy Court Revision: Hearings on H.R. 8200 Before the Subcomm. on Civ. and Const. Rts. of the H. Comm. on the Judiciary*, 95th Cong. 9 (1977) (statement of J. Simon H. Rifkind, American College of Trial Lawyers)) (discussing the formation of the bankruptcy court system).

37. Act of Jan. 4, 2011, Pub. L. No. 111-349, § 1, 124 Stat. 3674 (2011); Press Release, Off. of the Dist. Ct. Exec. for the E. Dist. of New York, EDNY Implements Patent Pilot Program (Feb. 7, 2012), https://img.nyed.uscourts.gov/files/local_rules/PatentPilotProject-NYEDPressRelease.pdf [<https://perma.cc/E92Z-L6F2>] (noting E.D.N.Y. was one of fourteen courts participating in the Patent Pilot Program).

38. § 1(a)(1)(C)-(D), (a)(3), 124 Stat. at 3674.

39. MARGARET S. WILLIAMS, REBECCA EYRE & JOE CECIL, FED. JUD. CTR., PATENT PILOT PROGRAM: FIVE-YEAR REPORT 1, 22-23, 35-36 (2016), <https://www.fjc.gov/content/316142/>

Congress has made some effort to increase technical expertise in patent cases. Under the Leahy-Smith America Invents Act (AIA), it created the Patent Trial and Appeal Board (PTAB) to facilitate validity challenges.⁴⁰ The Board's Administrative Patent Judges are required to "be persons of competent legal knowledge and scientific ability."⁴¹ However, although an effort is made to ensure that each three-judge panel has at least one judge in the relevant technical field,⁴² this is not always the case.⁴³ With regard to increasing technical expertise in the courts, Congress has not passed any legislation. Although the House bill for the Patent Pilot Program called for funding to train judges and employ law clerks with technical backgrounds, these provisions were cut prior to passage.⁴⁴

2. *Benefits and Risks of Specialization*

Judicial specialization provides several advantages. As judges accumulate experience from deciding cases in a single subject area, they become more efficient and potentially increase the quality and accuracy of their decision-making.⁴⁵ Because they gain a better

patent-pilot-program-five-year-report [https://perma.cc/PV9D-EQSC] (noting that although designated judges decide patent cases faster compared to nondesignated judges, the appeal rate seems to be the same between the two groups); Amy Semet, *Specialized Trial Courts in Patent Litigation: A Review of the Patent Pilot Program's Impact on Appellate Reversal Rates at the Five-Year Mark*, 60 B.C. L. REV. 519, 571 (2019) ("[L]ittle difference exists in appellate court treatment based on the specialization of the judge.").

40. See Eisenberg, *supra* note 21, at 2389 (observing that Congress created the PTAB "to provide a quicker, cheaper, and more expert alternative to federal district courts for adjudicating validity challenges").

41. 35 U.S.C. § 6(a).

42. Rochelle Cooper Dreyfuss, *Giving the Federal Circuit a Run for Its Money: Challenging Patents in the PTAB*, 91 NOTRE DAME L. REV. 235, 240 (2015).

43. See Charles W. Shifley, "Your PTAB Judges Will Be Experts"—Right? ... Not So Fast, BANNER & WITCOFF (July 26, 2016), <https://bannerwitcoff.com/wp-content/uploads/2016/08/ALERT-PTAB-Highlights.Shifley.07.26.2016.pdf> [https://perma.cc/X9KP-G7SE] (discussing cases that contained judges with no relevant technical background).

44. Compare H.R. 628, 111th Cong. § f(1) (2011), with Act of Jan. 4, 2011, Pub. L. No. 111-349, § 1, 124 Stat. 3674.

45. See Oldfather, *supra* note 7, at 856 (observing that scholars suggest that specialized judges "will possess a more comprehensive understanding of the complex legal machinery governing a subject, and will consequently be better able to tinker with that machinery in ways that will improve its performance"); Rochelle Cooper Dreyfuss, *Specialized Adjudication*, 1990 BYU L. REV. 377, 378 (noting that if "experts are better than laymen at dealing with matters in their special areas, the specialized judiciary should handle cases more efficiently,

understanding of the applicable legal doctrines, their opinions may become more uniform and predictable than their generalist counterparts.⁴⁶ Specialized judges may also have a firmer grasp of complex facts underpinning a dispute.⁴⁷ This is particularly true, in the case of patent law, for judges who possess a relevant technical background.⁴⁸

However, the benefits of specialization are accompanied by related risks. Like administrative agencies, specialized courts may be vulnerable to capture by interest groups, due to the concentration of similar cases leading to repeat encounters with the specialized bar that brings the cases before the court.⁴⁹ A greater risk of politicization exists as well.⁵⁰ Interest groups will focus their lobbying efforts to have judges appointed who represent their interests, which may taint the appointments process.⁵¹ The popularity of specialized courts with litigants may, moreover, be due to their bias rather than their quality.⁵²

Prior work experience can also impact the outcome of cases. For example, in the context of immigration law, a group of scholars found that judges with prior work experience at the Department of Homeland Security or Immigration and Naturalization Service granted only 38.9 percent of asylum cases, compared to 48.2 percent

thereby reducing the number of judge-hours required to decide any given number of cases”).

46. LAWRENCE BAUM, *SPECIALIZING THE COURTS* 218 (2011) (noting how specialization may lead to “greater uniformity of legal doctrine”).

47. *See Revesz, supra* note 26, at 1117-18.

48. *See Oldfather, supra* note 7, at 856.

49. *See Anderson, supra* note 22, at 1618 (arguing that the “[c]oncentration of cases makes judges more capture-prone, or at least more likely to be targeted for capture”); Dreyfuss, *supra* note 45, at 380 (discussing the risk of capture); Diane P. Wood, *Generalist Judges in a Specialized World*, 50 *SMU L. REV.* 1755, 1767-68 (1997) (discussing “powerful arguments” against specialization, including the decreased risk of regulatory capture, the cross-fertilization of ideas, and the commonalities of all areas of law).

50. *See Dreyfuss, supra* note 45, at 379.

51. *See id.* at 379-80 (observing that it is much easier for interest groups to capture a single specialized court compared to numerous general courts); BAUM, *supra* note 46, at 221 (observing how the selection of specialized judges can be skewed to those who have “a particular policy orientation”).

52. For example, the popularity of the Eastern District of Texas for patent litigation was more likely for the pro-patent bias of both the court and the juries than for the quality and accuracy of its decisions. *See Ana Santos Rutschman, Patent Venue Exceptionalism After TC Heartland v. Kraft*, 25 *U. MIA. BUS. L. REV.* 29, 36-37 (2017) (discussing how the convergence of “pro-plaintiff factors” made the Eastern District of Texas the most popular patent forum).

from judges with other backgrounds.⁵³ Similarly, judges with military backgrounds were 18 percent less likely to grant asylum than those without.⁵⁴ This means that when Congress specializes courts, it must consider how that could impact the background of the people who get appointed as judges and how that might alter the court's jurisprudence.

Furthermore, specialized courts can become highly insular. As Judge Simon Rifkind noted, if one isolates patent law, it will eventually “develop[] a jargon of its own, thought-patterns that are unique, internal policies which it subserves and which are different from and sometimes at odds with the policies pursued by the general law.”⁵⁵ A generalist familiar with many areas of law may be able to better contextualize a seemingly unique case.⁵⁶

Because of these potential drawbacks, it is important to move cautiously with any plan to increase judicial specialization and to ensure that the benefits outweigh the risks.⁵⁷ One must also consider what kind of specialization would best aid the judiciary. For these reasons, trials like the Patent Pilot Program represent a good way to generate data and evaluate the merits of different proposals.⁵⁸

53. Jaya Ramji-Nogales, Andrew I. Schoenholtz & Philip G. Schrag, *Refugee Roulette: Disparities in Asylum Adjudication*, 60 STAN. L. REV. 295, 345-46 (2007).

54. *Id.* at 346.

55. Simon Rifkind, *A Special Court for Patent Litigation? The Danger of a Specialized Judiciary*, 37 A.B.A. J. 425, 425 (1951). Judge Rifkind's fears have arguably come to pass, as the Federal Circuit's case law drifted away from mainstream administrative law that is supposed to govern all federal agencies. *See generally* Sapna Kumar, *The Accidental Agency?*, 65 FLA. L. REV. 229 (2013) (discussing how the Federal Circuit has routinely disregarded basic principles of administrative law over the years).

56. *See* Oldfather, *supra* note 7, at 863 (observing that a generalist may have “the virtue of being able to cut through the seeming uniqueness of any given new situation” and recognize that the case at hand “is ultimately just another variation on a familiar theme”).

57. *See* David B. Rottman, *Does Effective Therapeutic Jurisprudence Require Specialized Courts (and Do Specialized Courts Imply Specialist Judges)?*, 37 CT. REV. 22, 24-25 (2000) (noting that because specialized courts are the exception, the burden of proof for showing its benefits outweigh the costs lies with its proponents).

58. *See, e.g.,* WILLIAMS ET AL., *supra* note 39, at 38-39.

B. The Role of Generalist District Courts in Patent Litigation

District judges generally serve two primary roles. First, they declare what the law is, both through creating new legal standards and modifying existing ones.⁵⁹ In doing so, they help alter people's behavior by sanctioning certain acts.⁶⁰ Second, district judges resolve disputes between private parties.⁶¹ They play a far greater role in dispute resolution than appellate judges because they handle the overwhelming majority of U.S. cases.⁶² Beyond presiding over trials, district judges also help facilitate settlement.⁶³ The onset of litigation can precipitate "bargaining in the shadow of the law," with judges signaling to lawyers to craft out-of-court resolutions to their disputes.⁶⁴ Judges can help the parties form settlement agreements,⁶⁵ sometimes facilitated by magistrate judges with expertise in mediation.⁶⁶

59. See Oldfather, *supra* note 7, at 868 (noting one purpose of trial courts "is the creation and refinement of legal standards—the law declaration role").

60. See Kenneth E. Scott, *Two Models of the Civil Process*, 27 STAN. L. REV. 937, 938 (1975) (noting that under a "Behavior Modification Model," courts provide a method "of altering behavior by imposing costs on a person").

61. See Oldfather, *supra* note 7, at 868 (observing that the two roles of trial courts are private dispute resolution and declaring what the law is); Scott, *supra* note 60, at 937 (discussing that under the "Conflict Resolution Model" of the civil process, the primary role of civil process is to settle disputes between private parties).

62. See Chris Guthrie, Jeffrey J. Rachlinski & Andrew J. Wistrich, *Blinking on the Bench: How Judges Decide Cases*, 93 CORNELL L. REV. 1, 4 (2007).

63. See Judith Resnik, *Managerial Judges*, 96 HARV. L. REV. 374, 379-80 (1982) (discussing how trial judges engage in "informal dispute resolution and ... case management").

64. See Marc Galanter, *The Hundred-Year Decline of Trials and the Thirty Years War*, 57 STAN. L. REV. 1255, 1264 (2005) (noting that "[t]he promise of full-blown adjudication in a public forum" has been "increasingly redeemed by 'bargaining in the shadow of the law'" (citation omitted)).

65. See Sandra S. Beckwith, *District Court Mediation Programs: A View from the Bench*, 26 OHIO STATE J. ON DISP. RESOL. 357, 357-58 (2011) (discussing different approaches taken by district courts to encourage mediation); Francis E. McGovern, *Toward a Functional Approach for Managing Complex Litigation*, 53 U. CHI. L. REV. 440, 442 (1986) (noting that although the "classic model" had judges playing a passive role in dispute resolution, the newer model suggests that "judges should actively intervene in the administration of justice"); Resnik, *supra* note 63, at 380 (discussing how trial judges engage in "informal dispute resolution and case management").

66. For example, the District of Delaware uses magistrate judges trained in mediation to assist with alternative dispute resolution. See, e.g., *Chief Magistrate Judge Mary Pat Thyng*, U.S. DIST. CT. DIST. OF DEL., <https://www.ded.uscourts.gov/judge/chief-magistrate-judge-mary-pat-thyng> [<https://perma.cc/8P48-BYVV>].

In the context of patent law, the district court's role is slightly altered, because its function of declaring what constitutes patent law is not as important compared to other substantive areas. The Federal Circuit has a congressional mandate to provide uniformity in patent law and, for better or for worse, is the primary interpreter of the Patent Act.⁶⁷ Because nearly two-thirds of the Federal Circuit's docket is patent related,⁶⁸ district courts have access to clarifications of many issues arising in substantive patent law.

One can therefore argue that the availability of Federal Circuit precedent to guide lower courts on substantive patent law factors against a need for legal specialization.⁶⁹ Although district judges must deal with patent issues of first impression, the Federal Circuit can engage in error correction through appellate review.⁷⁰ There are admittedly some issues that hinder this: district judges do not generally follow Federal Circuit case law and must invest time in learning about relevant patent cases,⁷¹ and the Federal Circuit has been criticized both for the lack of clarity in various patent doctrines,⁷² and for its unwillingness to resolve conflicting decisions through rehearing cases en banc.⁷³ Nevertheless, some argue that

67. See Kumar, *supra* note 55, at 231, 243-44 (discussing the Federal Circuit's congressional mandate to unify patent law and serve as the administrator of the Patent Act).

68. Dyk, *supra* note 9, at 77.

69. See *id.* (noting the high percentage of patent cases on the Federal Circuit's docket); Kumar, *supra* note 55, at 231 (observing the emergence of "bright-line rules" that helped unify patent law and clarify legal issues).

70. See Kumar, *supra* note 55, at 232 (noting that the Federal Circuit reviews almost all patent appeals).

71. See Holderman, *supra* note 2, at 429 (observing that Northern District of Illinois judges receive slip opinions from the Seventh Circuit, but not from the Federal Circuit, and that "only when a patent case comes our way do we brush up on the latest developments in the law").

72. See, e.g., Bernard Chao, *Patent Law's Domestic Sales Trap*, 93 DENV. L. REV. ONLINE 87, 89 (2016), <https://www.denverlawreview.org/dlr-online-article/2016/4/6/patent-laws-domestic-sales-trap.html> [<https://perma.cc/W5WQ-S8BG>] (discussing the confusing line of precedent regarding whether a sale took place in the United States and is therefore subject to the U.S. Patent Act); Rebecca K. Stewart, *Weeds, Seeds & Deeds Redux: Natural and Legal Evolution in the U.S. Seed Wars*, 18 STAN. TECH. L. REV. 79, 117-18 (2014) (discussing how the Federal Circuit's case law regarding utility patent protection for seeds contains substantial ambiguities).

73. See Paul Michel & John Battaglia, *On Claim Construction, Predictability, and Patent Law Consistency: The Federal Circuit Needs to Vote En Banc*, IP WATCHDOG (Feb. 3, 2020), <https://www.ipwatchdog.com/2020/02/03/claim-construction-predictability-patent-law-consistency-federal-circuit-needs-vote-en-banc/id=118481/> [<https://perma.cc/GY4X-7YYF>]

given time, generalist judges should be able to understand existing patent precedent.⁷⁴

However, district courts are crucial in resolving private patent disputes, and to do so accurately, they must understand the technology that underlies the claims at issue.⁷⁵ Take, for example, *Markman* hearings, which are pretrial hearings during which the judge determines the proper meaning for the patent claims that are at issue.⁷⁶ As Judge Mayer noted in his dissent in *Phillips v. AWH Corp.*, during the hearing:

[P]arties battle over experts offering conflicting evidence regarding who qualifies as one of ordinary skill in the art; the meaning of patent terms to that person; the state of the art at the time of the invention; contradictory dictionary definitions and which would be consulted by the skilled artisan; the scope of specialized terms; the problem a patent was solving; what is related or pertinent art; whether a construction was disallowed during prosecution; how one of skill in the art would understand statements during prosecution; and on and on.⁷⁷

Claim construction requires judges “to sift through and weigh volumes of evidence” and determine how a person having ordinary skill in the art would interpret the language⁷⁸—something that is not possible if the judge does not understand the technology at issue.⁷⁹

District judges tend to be generalists who are expected to handle a wide range of legal issues.⁸⁰ A few judges hear a high volume of

(maintaining that the Federal Circuit “needs to go en banc more” to help address unresolved and unpredictable precedent).

74. See Wood, *supra* note 1, at 7 (maintaining that “the basic legal principles” of patent law “are relatively straightforward”).

75. See Fromer, *supra* note 6, at 314-15 (discussing how district judges must understand underlying technology to make many determinations in patent cases).

76. See *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 378, 388-90 (1996) (holding that although claim construction is a hybrid question of law and fact, judges should construe claim language).

77. 415 F.3d 1303, 1332 (Fed. Cir. 2005) (Mayer, J., dissenting).

78. *Id.*

79. See Schwartz, *supra* note 24, at 260 (“A judge needs to understand the core technology to interpret claim terms properly.”); Fromer, *supra* note 6, at 314 (discussing how judges must understand underlying technology to construe claims).

80. See James F. Holderman & Halley Guren, *The Patent Litigation Predicament in the*

patent cases and become legally specialized,⁸¹ but technical backgrounds appear to be uncommon.⁸² It is therefore not surprising that some judges dislike patent cases and feel overwhelmed by their patent docket.⁸³ As Judge Patti Saris of the District of Massachusetts observed: “A lot of my colleagues hate patent cases. *Hate* them. They say, ‘I tell you what, if you do my patent case, I’ll do five ERISA cases.’”⁸⁴ As Judge Saris further noted, the high reversal rate from Federal Circuit review “demoralizes” many district judges.⁸⁵ Prior to joining the Federal Circuit, Judge Kimberly Moore questioned why “district court judges conduct trials and decide complex issues of patent infringement and validity based on their claim constructions” when they are reversed in one in three cases.⁸⁶

Admittedly, the lack of technical expertise is not the only impediment to accurate claim construction. As Judge Paul Michel and John Battaglia have noted, there is a split on major claim construction canons dating back several decades.⁸⁷ The Federal Circuit’s inexplicable reticence to address this issue en banc makes the job of district court judges that much harder.⁸⁸ But the Federal

United States, 2007 U. ILL. J. L. TECH. & POL’Y 1, 5 (discussing the generalist nature of district court judges).

81. For example, between 2011 and 2017, Judge Gilstrap handled more than four thousand patent infringement lawsuits. Nushin Huq, *Rural Texas Judge Runs Busiest Patent Court in U.S.*, BLOOMBERG L. (Apr. 20, 2017, 10:24 AM), <https://news.bloomberglaw.com/us-law-week/rural-texas-judge-runs-busiest-patent-court-in-us> [<https://perma.cc/8PVL-LKE7>]. Though, as Judge O’Malley has observed, even judges who hear patent cases can make mistakes because they do not realize how the law has evolved. O’Malley et al., *supra* note 1, at 683; *see also* Mark A. Lemley, Su Li & Jennifer M. Urban, *Does Familiarity Breed Contempt Among Judges Deciding Patent Cases?*, 66 STAN. L. REV. 1121, 1137 (2014) (listing judges who decided ten or more substantive patent cases between 2001 and 2010).

82. It is difficult to ascertain precisely how many judges have technical backgrounds, given the lack of availability of public data. *See* Lemley et al., *supra* note 81, at 1153 (discussing the difficulty in ascertaining whether district court judges possess technical backgrounds).

83. *See* O’Malley et al., *supra* note 1, at 682 (“I have heard trial judges claim that they dislike patent litigation, partly because it is hard.” (remarks of Hon. Patti Saris)); Holderman, *supra* note 2, at 428 (observing that many of Judge Holderman’s colleagues do not enjoy patent cases); *see also* Moore, *supra* note 23, at 933 (“[Patent suits] are among the most complex cases on [district courts’] dockets.”).

84. O’Malley et al., *supra* note 1, at 683 n.31 (remarks of Hon. Patti Saris).

85. *Id.* at 682.

86. Moore, *supra* note 5, at 31.

87. Michel & Battaglia, *supra* note 73.

88. *See id.*

Circuit's problems aside, the lack of technical expertise in district courts contributes to the problem by making judges highly dependent on outside experts to educate them.⁸⁹ As Part II discusses, such experts come with drawbacks.

II. TECHNICAL EXPERTISE OF U.S. JUDGES

Technical expertise is largely lacking in the U.S. judiciary. Congress has considered ways to improve judges' legal skills in patent cases through the Patent Pilot Program, which allows judges in participating courts to opt in or out of hearing patent cases.⁹⁰ But Congress has made no attempt to integrate greater technical expertise into the judiciary. Moreover, the Federal Circuit has cautioned district judges against regularly using technical advisors, fearing that experts could unduly influence court proceedings.⁹¹ Consequently, district judges remain dependent on party-hired experts for learning case-related technology.

Section A examines district judges' use of party-hired experts in patent cases and considers drawbacks to this practice. Section B then discusses how law clerks may be employed to serve as quasi-experts to judges. Section C looks at how judges use neutral experts, such as technical advisors, and discusses limitations that prevent such experts from being used more broadly.

A. Party-Hired Experts

To accurately construe the patent claims at issue in a particular case, district judges must first grasp the relevant technology. But intrinsic evidence from the patent application is not always conclusive, leading district judges to rely upon technical information provided by the parties.⁹² Party-created tutorials provide an

89. See *infra* Part II.

90. See Semet, *supra* note 39, at 539-40.

91. See also TechSearch, L.L.C. v. Intel Corp., 286 F.3d 1360, 1377-78 (Fed. Cir. 2002) (citing Ass'n of Mexican-Am. Educators v. California, 231 F.3d 572, 590-91 (9th Cir. 2000)) (noting that technical advisors should seldom be used and only in exceptional cases).

92. See Phillips v. AWH Corp., 415 F.3d 1303, 1318 (Fed. Cir. 2005) ("[E]xtrinsic evidence in the form of expert testimony can be useful to a court for a variety of purposes, such as to provide background on the technology at issue.").

overview of relevant scientific concepts and serve as a crucial source of information for judges who lack technically trained law clerks or neutral experts.⁹³ Prior to the *Markman* hearing, party experts will usually prepare competing reports regarding the proper meaning of the relevant terms, and during the hearing, a judge will hear from both sides to help determine the proper claim construction.⁹⁴ In this “battle of the experts,” the judge is forced into the difficult position of evaluating biased scientific evidence in an attempt to discern what is true.⁹⁵

There is an open question with regard to whether judges can adequately sift evidence to construe claims and, more generally, serve as an adequate gatekeeper to scientific evidence.⁹⁶ The en banc Federal Circuit in *Phillips v. AWH Corp.* noted that district judges have “discretion to admit and use” extrinsic evidence, but “should keep in mind the flaws inherent in each type of evidence and assess that evidence accordingly.”⁹⁷ In *Daubert v. Merrell Dow*

93. See *Judges Discuss Best Practices in Patent Law*, TEX. LAW. (June 3, 2013) (discussing Judge Lynn’s reliance on tutorials, given the lack of available technically trained law clerks).

94. See Melissa F. Wasserman, *The Changing Guard of Patent Law: Chevron Deference for the PTO*, 54 WM. & MARY L. REV. 1959, 2009 (2013). With regard to *Markman* hearings, District Judge Reed O’Connor noted, “I don’t have an engineering background, and so for me it’s very helpful to have that to be prepared ahead of time to go in there and then to listen to both sides address the issues and argue their points.” *Judges Discuss Best Practices in Patent Law*, *supra* note 93.

95. See Wasserman, *supra* note 94, at 2009 (discussing how party-provided scientific and technical information is of diminished value); Michael J. Burstein, *Rules for Patents*, 52 WM. & MARY L. REV. 1747, 1786 (2011) (observing that party-presented evidence is “prone to bias”); Rai, *supra* note 23, at 892 (“Battles of the experts’ ... are likely to shed more heat than light.”).

There are other options to help facilitate the use of party-hired experts. Australian courts routinely use the “hot tub” method of expert testimony, in which experts give their evidence on a particular point at the same time, with the judge taking an active role in questioning them. See Steven Rares, *Using the “Hot Tub,”* FED. CT. OF AUSTRALIA (Oct. 12, 2013), <https://www.fedcourt.gov.au/digital-law-library/judges-speeches/justice-raises-rares-j-20131012> [<https://perma.cc/GKW7-A5JY>]; Alexander Canale & Peter Munro, *Experts in a Hot Tub—Testifying Concurrently as an Expert Witness*, ALVAREZ & MARSAL (Oct. 24, 2019), <https://www.alvarezandmarsal.com/insights/experts-hot-tub-testifying-concurrently-expert-witness> [<https://perma.cc/9Y47-NSXQ>].

96. See Xavier Seuba, *Scientific Complexity and Patent Adjudication: The Technical Judges of the Unified Patent Court*, in INTELLECTUAL PROPERTY AND THE JUDICIARY 265, 265 (Christophe Geiger et al. eds., 2018) (observing that the role of gatekeeper “may become easily confused with that other role of ‘amateur scientist[.]’” and that judges face difficulties because of their lack of knowledge).

97. 415 F.3d at 1319.

Pharmaceuticals, Inc., the Supreme Court tasked district courts with ensuring that only “good” science reaches the jury.⁹⁸

Yet, judges who possess neither technical training nor neutral advisors are arguably ill-equipped to make such decisions.⁹⁹ In a concurrence, Justice Breyer maintained that the *Daubert* requirements “will sometimes ask judges to make subtle and sophisticated determinations” regarding “scientific methodology and its relation to the conclusions an expert witness seeks to offer.”¹⁰⁰ He observed that “judges are not scientists and do not have the scientific training that can facilitate the making of such decisions.”¹⁰¹ Judge James Holderman and Halley Guren have noted that without having that technical background, district judges are far more likely to draw the wrong conclusion than they would “if the factual premises underlying the factual basis of the dispute had a familiar ring” based on their education or experience.¹⁰² It is also possible that judges will evaluate the expert evidence merely on the credentials and demeanor of the experts.¹⁰³

One potential problem with altering this system is the concern that it might undermine the adversarial system. But as Arti Rai has observed, in technically complex patent litigation, “reducing the adversarial component may be a virtue rather than a vice,” given that expert witnesses “are likely to shed more heat than light.”¹⁰⁴ Moreover, a judge’s ability to gain an accurate understanding of the relevant technology through experts requires that both parties be well-funded. Judge Posner noted that “[i]t is heartless” for courts “to make a fetish of adversary procedure” if “the opponent has no

98. 509 U.S. 579, 590, 597 (1993) (noting that scientific testimony “must be supported by appropriate validation—i.e., ‘good grounds,’ based on what is known” and that judges serve as the gatekeepers).

99. See Edward K. Cheng, *Independent Judicial Research in the Daubert Age*, 56 DUKE L.J. 1263, 1266 (2007) (observing that judges are generally unfamiliar with specialized scientific information and lack the requisite background to assess reliability); Scott Brewer, *Scientific Expert Testimony and Intellectual Due Process*, 107 YALE L.J. 1535, 1618 (1998) (discussing the inadequacy of forcing nonexperts to sort biased scientific evidence).

100. Gen. Elec. Co. v. Joiner, 522 U.S. 136, 147 (1997) (Breyer, J., concurring).

101. *Id.* at 148.

102. See Holderman & Guren, *supra* note 80, at 6.

103. Brewer, *supra* note 99, at 1618 (“[I]t seems likely that many judges would be led to convert what is on the surface a substantive inquiry by nonexpert judges—as directed by *Daubert*—into a form of deference based on demeanor and credentials.”).

104. Rai, *supra* note 23, at 892.

practical access to offsetting evidence,” leading to “feeble evidence” being used instead.¹⁰⁵ If a well-funded patent holder sues a small business or an individual, the party-expert system of providing technical information to the judge is unlikely to work, if such a case ever even makes it to trial.¹⁰⁶

The U.S. system of district judges relying almost exclusively on partisan experts is, overall, deeply troubling. At their worst, expert reports for *Markman* hearings are authored by the attorneys,¹⁰⁷ and expert witnesses will merely parrot what the attorneys want them to say.¹⁰⁸ The Federal Circuit has observed that “expert reports and testimony [are] generated at the time of and for the purpose of litigation” and consequently, may “suffer from bias that is not present in intrinsic evidence.”¹⁰⁹ It recognized that “each party will naturally choose the pieces of extrinsic evidence most favorable to its cause,” thereby forcing the district judge to “filter[] the useful extrinsic evidence from the fluff.”¹¹⁰ Such a task may be beyond a typical judge’s ability.

105. *Rowe v. Gibson*, 798 F.3d 622, 630 (7th Cir. 2015); see also Allison Orr Larsen, *Judicial Factfinding in an Age of Rapid Change: Creative Reforms from Abroad*, 130 HARV. L. REV. 316, 316-17 (2017) (discussing the difficulty of balancing judges relying on “unsubstantiated claims” that have not gone through the adversarial process versus relying on party-supplied information when there are “lopsided” resources).

106. See Kathleen Kim, *Legal Research Site Names 2,000 Patent Trolls, INC.* (Dec. 21, 2012), <https://www.inc.com/kathleen-kim/exposed-names-of-patent-trolls-revealed.html.html> [<https://perma.cc/MH63-UAE2>] (discussing how nonpracticing patent holding companies sue small companies for patent infringement, often forcing these companies to settle).

107. Although the Federal Circuit does not appear to have opined on this issue, several district courts have held that attorneys may assist in the drafting of expert reports, so long as the substance is from the expert. See *Seitz v. Envirotech Sys. Worldwide Inc.*, No. H-02-4782, 2008 WL 656513, at *2 (S.D. Tex. Mar. 6, 2008). Courts vary on what the remedy is if the attorney does contribute substance to the expert report. See Michael Lowry, *Can an Attorney Prepare the Expert’s Report? Part 2*, COMPELLING DISCOVERY (Oct. 5, 2015), <https://www.compellingdiscovery.com/?p=3128> [<https://perma.cc/Y88F-57ML>] (noting that some courts will find an attorney-drafted report admissible but give it less weight, while others will conclude it violates Federal Rule of Civil Procedure 26’s requirement that the expert prepare the report).

108. See John H. Langbein, *The German Advantage in Civil Procedure*, 52 U. CHI. L. REV. 823, 835 (1985) (discussing experts as “saxophones,” in which “the lawyer plays the tune, manipulating the expert as though the expert were a musical instrument”).

109. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1318 (Fed. Cir. 2005).

110. *Id.*

B. Law Clerks

One way that judges compensate for their lack of technical expertise is by hiring law clerks with technical backgrounds.¹¹¹ In the past, there has been some effort to expand funding for technically trained clerks as part of broader patent reform, though no such legislation has ever passed.¹¹²

From a judge's perspective, using clerks as experts has some advantages. Judges need not disclose to the parties the conversations that they had with their clerks.¹¹³ Judges already have a budget to hire them, so there is no additional cost to the court or to the parties, and clerks are cheap compared to full-fledged experts.¹¹⁴ Additionally, clerks generally work in the same office as judges, making it easy for judges to ask them questions about technology.¹¹⁵

However, relying on law clerks for technical expertise comes with several disadvantages. District judges have only two or three clerks,

111. See Moore, *supra* note 5, at 18. It is difficult to assess what percentage of Federal Circuit and district court clerks have technical backgrounds, given that this information is not generally publicly released. Justice Breyer suggested that judges utilize "specially trained law clerks" to compensate for their lack of scientific expertise. *Gen. Elec. Co. v. Joiner*, 522 U.S. 136, 149 (1997) (Breyer, J., concurring).

112. See C. Erik Hawes & James Beebe, *H.R. 5418 and Specialized 'Patent Courts': The Latest Congressional Effort at Patent Reform*, IPL NEWSL. A.B.A., Winter 2007, at 18 (discussing H.R. 5418's provision that would have provided \$5 million a year for judicial training of designated patent judges and law clerks "with expertise in technical matters arising in patent and plant variety protection cases").

113. See Todd C. Peppers, Micheal W. Giles & Bridget Tainer-Parkins, *Inside Judicial Chambers: How Federal District Court Judges Select and Use Their Law Clerks*, 71 ALB. L. REV. 623, 636 (2008); see also Mitu Gulati & Richard A. Posner, *The Management of Staff by Federal Court of Appeals Judges*, 69 VAND. L. REV. 479, 485 (2016).

114. See Mira Gur-Arie, Senior Attorney, Fed. Jud. Ctr., *Legal and Court Staff in the United States Judiciary*, Presentation at the Seminar on the Management of the Assistant Personnel to Judges at 5 (Nov. 22-26, 2004), <https://www.fjc.gov/sites/default/files/2012/StaffEng.pdf> [<https://perma.cc/7JD3-YYWD>]. Law clerks are paid at Judicial Salary Plan (JSP) 11, step 1 to JSP 13, step 1, depending on their experience. *Qualifications, Salary, and Benefits*, OSCAR (Feb. 1, 2018), https://oscar.uscourts.gov/qualifications_salary_benefits#salary [<https://perma.cc/TPS4-GTLX>]. This can result in a law clerk base pay rate as low as \$55,204 a year for JSP 11-1. See *Judiciary Salary Plan Base Pay Rates*, U.S. CTS. (Jan. 6, 2020), https://www.uscourts.gov/sites/default/files/2020/jsp_base_pay_rates_table_00_2020.pdf [<https://perma.cc/AQV7-TEN9>].

115. See Donald W. Molloy, *Designated Hitters, Pinch Hitters, and Bat Boys: Judges Dealing with Judgment and Inexperience, Career Clerks or Term Clerks*, 82 L. & CONTEMP. PROBS. 133, 137 (2019).

and Federal Circuit judges have three or four.¹¹⁶ This means that no judge will be able to cover all areas of technology with clerks alone. Moreover, only so many law school graduates have technical degrees, relevant work experience, and strong legal credentials.¹¹⁷ Clerks typically serve only one to two years, meaning that judges must constantly search for new ones.¹¹⁸ Technically trained clerks might also be less knowledgeable in other areas of law that are relevant to the court's docket, such as criminal law. For a judge who hears patent cases sporadically, hiring one or more specialized clerks may not make sense.

More troubling is the lack of transparency and oversight with regard to judges' use of clerks. If a judge utilizes a neutral expert, parties can generally raise objections regarding the expert's qualifications.¹¹⁹ By contrast, judges control whom they hire for clerkships, and such clerks may lack sufficient skills to be adequate technical advisors.¹²⁰ Furthermore, there is no indication in a judicial opinion regarding which information is coming from the clerk. Judicial abdication is already a general concern with regard to judges' use of clerks,¹²¹ and the risk is far greater when relying on them for knowledge that the judge does not possess.

C. Court-Appointed Experts and Advisors

In the 1920 case *Ex parte Peterson*, the Supreme Court held that “[c]ourts have ... inherent power to provide themselves with

116. The exact number of law clerks a judge gets depends on whether the judge has a secretary. See Gur-Arie, *supra* note 114, at 6 (observing that although appellate court judges have three clerks and district court judges have two clerks, judges may choose to forgo an administrative assistant to receive one additional clerk).

117. See *Judges Discuss Best Practices in Patent Law*, *supra* note 93 (remarks of Hon. Barbara Lynn) (discussing the lack of available law clerks with engineering backgrounds in the Northern District of Texas).

118. Gur-Arie, *supra* note 114, at 5. Some district judges do utilize career clerks, but the Judicial Conference has made it harder for judges to keep clerks for more than four years. See Molloy, *supra* note 115, at 141.

119. See FED. R. EVID. 706(a)-(b).

120. See *Judges Discuss Best Practices in Patent Law*, *supra* note 93 (remarks of Hon. Barbara Lynn) (describing the difficulties of finding clerks with applicable technical backgrounds).

121. Molloy, *supra* note 115, at 149-50 (discussing district judges' concern about judicial abdication with regard to the use of both term and permanent law clerks).

appropriate instruments required for the performance of their duties.”¹²² This gives judges “authority to appoint persons unconnected with the court to aid judges in the performance of specific judicial duties.”¹²³ In Justice Breyer’s concurrence in *General Electric Co. v. Joiner*, he supported the idea of judges using this authority to hire neutral experts.¹²⁴ However, district courts rarely utilize technical advisors, neutral testifying experts, or special masters in patent cases.¹²⁵ This is due to a variety of concerns, including restrictions from the Federal Circuit and a fear that the expert will usurp the role of the judge or the jury.

1. Technical Advisors

Technical advisors are not court-appointed expert witnesses,¹²⁶ but instead provide support to the judge out of sight of the parties and the jury.¹²⁷ As the First Circuit observed, their “role is to act as a sounding board for the judge” by helping the judge learn “the jargon and theory disclosed by the testimony” and assisting the judge in “think[ing] through the critical technical problems.”¹²⁸ Their role is analogous to that of scientific advisors used by courts in the United Kingdom.¹²⁹

122. 253 U.S. 300, 312 (1920).

123. *Id.*

124. See 522 U.S. 136, 149-50 (1997) (Breyer, J., concurring) (agreeing with the New England Journal of Medicine amicus brief that judges should use their inherent powers to seek help from scientists in fulfilling their gatekeeper function).

125. See Joshua R. Nightingale, *An Empirical Study on the Use of Technical Advisors in Patent Cases*, 93 J. PAT. & TRADEMARK OFF. SOC’Y 400, 409-11 (2011) (observing that the use of court-appointed experts, special masters, and technical advisors is rare).

126. Because technical advisors are not court-appointed expert witnesses, their appointment is not subject to the requirements of Federal Rule of Evidence 706. *TechSearch L.L.C. v. Intel Corp.*, 286 F.3d 1360, 1380 (Fed. Cir. 2002) (“Rule 706 applies to expert witnesses, but not to technical advisors.”).

127. See Nightingale, *supra* note 125, at 414-15 (noting that a technical advisor’s “duty is generally fulfilled through off-the-record, ex parte communications with the judge”).

128. *Reilly v. United States*, 863 F.2d 149, 158 (1st Cir. 1988).

129. See *Halliburton Energy Servs. Inc. v. Smith Int’l (N. Sea) Ltd.* [2006] EWCA (Civ) 1599, [26], <http://www.bailii.org/cgi-bin/format.cgi?doc=/ew/cases/EWCA/Civ/2006/1599.html> [<https://perma.cc/WM2X-3G8Q>] (observing that the role of scientific advisors in the United Kingdom is “to help us understand that evidence, to help us consider whether the judge fully understood that evidence, and to help us evaluate the conclusions which the judge reached on that evidence”); Kirwin Lee, *On the Role of Scientific Advisors: Transparency and Expectations*, PATLIT (May 4, 2016), <http://patlit.blogspot.com/2016/05/on-role-of-scientific->

In *TechSearch L.L.C. v. Intel Corp.*, the Federal Circuit addressed the use of technical advisors.¹³⁰ The case involved complex microprocessor technology, leading the district judge to appoint a technical advisor to assist in understanding technology related to pretrial motions and trial proceedings.¹³¹ The expert promised to not conduct any independent investigation, contact the parties, or provide any evidence to the judge.¹³²

Although the Federal Circuit ultimately affirmed the judge's use of an advisor, it created obstacles to future uses.¹³³ The Federal Circuit maintained that the issue of court-appointed advisors is procedural and thereby subject to regional case law—in this case, from the Ninth Circuit.¹³⁴ It claimed that the Ninth Circuit in its en banc decision *Ass'n of Mexican-American Educators v. California (AMAE)* “implicitly recognized that district courts should use this inherent authority sparingly and then only in exceptionally technically complicated cases.”¹³⁵

The Federal Circuit then attempted to predict what procedural limitations the Ninth Circuit would employ “for minimally safeguarding the judicial process and the district court from undue influence by the technical advisor,” and to ensure that the advisors are used merely as tutors and providers of technical and background information.¹³⁶ The Federal Circuit inexplicably chose to follow Ninth Circuit Judge Tashima's dissenting *AMAE* opinion, holding that district courts must

use a “fair and open procedure for appointing a neutral technical advisor ... addressing any allegations of bias, partiality or lack of qualifications” in the candidates; clearly define and limit the technical advisor's duties, presumably in a writing disclosed to all parties; guard against extra-record information; and make

advisers.html [https://perma.cc/Q348-2U9F] (discussing how seldomly used scientific advisors help United Kingdom judges learn unfamiliar technology and terminology).

130. 286 F.3d at 1376-81.

131. *Id.* at 1368-69.

132. *Id.* at 1369.

133. *Id.* at 1377-80.

134. *Id.* at 1376-77.

135. *Id.* at 1378 (citing *Ass'n of Mexican-Am. Educators v. California*, 231 F.3d 572, 590-91 (9th Cir. 2000) (en banc)).

136. *Id.* at 1378-79.

explicit, perhaps through a report or record, the nature and content of the technical advisor's tutelage concerning the technology.¹³⁷

The Federal Circuit then went one step further than the *AMAE* dissent, maintaining that even if these guidelines permit the judge to use a technical advisor, it “does not mean that it is invariably desirable or that safeguards are not required.”¹³⁸ The Federal Circuit also claimed that “district court judges need to be extremely sensitive” to the “risk that some of the judicial decision-making function will be delegated to the technical advisor” and take steps to “minimize the potential for its occurrence.”¹³⁹ It suggested that courts should apply hard-look review to a judge's decision to use an advisor to ensure that the advisor is not actually deciding factual issues.¹⁴⁰ Quoting Judge Tashima's *AMAE* dissent, the Federal Circuit stated that although judges “can filter out ‘bad’ legal advice or research from a law clerk,” judges are “ill-equipped” to do the same from technical advisors.¹⁴¹

The Federal Circuit's concern about judges' overreliance on neutral experts is not wholly without merit. As discussed below, one of the reasons Switzerland created the Swiss Federal Patent Court was because some canton judges were rubber-stamping the opinions of court-appointed experts, no matter how flawed they were.¹⁴² The fact that the Swiss judges in certain cantons heard so few patent cases is believed to have contributed to an improper overreliance on expert opinions.¹⁴³ U.S. judges have wide leeway in selecting neutral experts, whether technical advisors or special masters.¹⁴⁴ This raises concerns that they might rely on information

137. *Id.* at 1379 (alteration in original) (footnotes omitted) (quoting *Ass'n of Mexican-Am. Educators*, 231 F.3d at 611 (Tashima, J., dissenting)).

138. *Id.*

139. *Id.*

140. *Id.* at 1379 n.6.

141. *Id.* (quoting *Ass'n of Mexican-Am. Educators*, 231 F.3d at 614 (Tashima, J., dissenting)).

142. See Martin J. Lutz, *Enforcement of Intellectual Property Laws*, 54 CHIMIA INT'L J. CHEM. 320, 323 (2000) (noting that under the prior Swiss system, “even a largely erroneous and unfounded court expert opinion [was] likely to be accepted as the basis of the decision”); *infra* Part III.A.2.

143. Lutz, *supra* note 142, at 323.

144. See *Techsearch L.L.C.*, 286 F.3d at 1378; Shira Scheindlin, *The Use of Special Masters*

from people who have not been fully vetted or, worse, engage in judicial abdication. The fact that technical advisors are not members of the court's staff and generally "work outside the scrutiny of the parties" also raises transparency concerns.¹⁴⁵

Nevertheless, the Federal Circuit's reasoning is fundamentally flawed. Beyond relying heavily on a dissenting Ninth Circuit opinion, it also took the statements of the majority out of context.¹⁴⁶ The Ninth Circuit majority spoke of the rarity of a judge needing a technical advisor,¹⁴⁷ but that rarity is likely driven by the fact that the Ninth Circuit does not hear patent cases.¹⁴⁸ Regional case law on the use of neutral experts has not been developed with patent litigation in mind, and the Federal Circuit failed to account for this.¹⁴⁹ Indeed, this mismatch between regional law and the specifics of patent litigation raises the question of whether the Federal Circuit erred in applying Ninth Circuit law with regard to the use of experts.¹⁵⁰

The Federal Circuit furthermore neglected to explain why its judges, the majority of whom have no technical background,¹⁵¹ should be advised on technology by clerks who are both technically and legally trained. Under the *TechSearch* court's reasoning, most Federal Circuit judges are "ill-equipped" to handle such input.¹⁵² There is no "fair and open procedure" for hiring clerks, their technical duties are not disclosed to the parties, there is no

in *Complex Cases*, LAW360 (Aug. 15, 2017, 11:36 AM), <https://www.law360.com/articles/950395/the-use-of-special-masters-in-complex-cases> [<https://perma.cc/MG6G-AJ8K>].

145. Rai, *supra* note 23, at 892; *see also* PETER MENELL, LYNN H. PASAHOW, JAMES POOLEY, MATTHEW D. POWERS, STEVEN C. CARLSON & JEFFREY G. HOMRIG, PATENT CASE MANAGEMENT JUDICIAL GUIDE 5-19 (2d ed. 2012) (discussing transparency concerns regarding judges' use of technical advisors).

146. *See* Luke L. Dauchot & Jeffrey C. Metzcar, *Technical Advisors: Welcome Scientific Education, but at What Cost to a Patent's Notice Function?*, 9 IP LITIGATOR, Mar./Apr. 2003, at 7 (maintaining that it is "charitable" to characterize the *TechSearch* court's holding "as having weak precedential underpinnings").

147. *Ass'n of Mexican-Am. Educators v. California*, 231 F.3d 572, 590 (9th Cir. 2000).

148. Only the Federal Circuit has jurisdiction to hear patent appeals. *History of the United States Court of Appeals for the Federal Circuit*, FED. CIR. HIST. SOC'Y, <https://www.federalcircuits.org/copy-of-history-of-the-court> [<https://perma.cc/8MFV-RVY8>].

149. *See* Dauchot & Metzcar, *supra* note 146, at 6.

150. *See id.*

151. Rai, *supra* note 23, at 888.

152. *See* *TechSearch L.L.C. v. Intel Corp.*, 286 F.3d 1360, 1379 n.6 (Fed. Cir. 2002) (quoting *Ass'n of Mexican-Am. Educators*, 231 F.3d at 614 (Tashima, J., dissenting)).

safeguard against extra-record technical information from them, nor do the parties know what technical tutoring judges receive from their clerks.¹⁵³ Perhaps the Federal Circuit judges believe that, because of their legal specialization, they can distinguish their use of clerks from district judges' use of technical advisors. But if that is the case, at minimum, it favors district courts with high patent dockets having ready access to technical expertise.

Beyond Federal Circuit case law, other obstacles hinder district judges' use of technical advisors. For courts that do not encounter many patent cases, it may be a time-consuming process to locate a trusted expert, particularly if the area of technology is complex.¹⁵⁴ Experts are expensive, and the cost is passed on directly to the litigating parties, who typically split the expert's fees.¹⁵⁵ Furthermore, the expert must not only have good credentials but also possess the ability to teach a lay person the relevant scientific or technical concepts.¹⁵⁶

A few judges in district courts with high patent dockets disregard *TechSearch* and regularly use advisors. For example, Judge Gilstrap in the Eastern District of Texas has several trusted advisors with patent litigation backgrounds whom he uses in cases with *Markman* hearings.¹⁵⁷ The party experts still prepare technology tutorials for Judge Gilstrap, but the advisors will review them and help explain the technology to him.¹⁵⁸ The advisors also help him prepare for the

153. See *supra* Part II.B.

154. See Edward K. Cheng, *Same Old, Same Old: Scientific Evidence Past and Present*, 104 MICH. L. REV. 1387, 1395-96 (2006) (surveying TAL GOLAN, *LAW OF MEN AND LAWS OF NATURE: THE HISTORY OF SCIENTIFIC EXPERT TESTIMONY IN ENGLAND AND AMERICA* (2004)) (discussing attempts from the 1950s to 1970s to establish lists of neutral experts to make it easier for judges to use neutral experts); Seuba, *supra* note 96, at 269 (noting it may be difficult to find suitable experts for cases involving complex technology).

155. FED. R. EVID. 706(c)(2).

156. For example, Judge Barbara Lynn recounted a case in which she hired a technical advisor, stating that she chose an expert who teaches undergraduate students and had won teaching awards "because [she] wanted the person that could talk to [her]." *Tips from the Bench: Assisting Juries in Patent Law Cases*, TEX. LAW. ONLINE (June 17, 2013), https://www.law.com/texaslawyer/almID/1202604221148&Tips_from_the_Bench_Assisting_Juries_in_Patent_Law_Cases/ [<https://perma.cc/P9YG-JTSH>].

157. See *id.*; Cara Salvatore, *Patent Trial Judges Oppose Posner's Push for Neutral Experts*, LAW360 (Sept. 30, 2016, 10:12 PM), <https://www.law360.com/ip/articles/847078/patent-trial-judges-oppose-posner-s-push-for-neutral-experts> [<https://perma.cc/ZPM9-DL6P>] (describing Judge Gilstrap's use of technical advisors).

158. See *Judges Discuss Best Practices in Patent Law*, *supra* note 93 (remarks of Hon.

Markman hearings.¹⁵⁹ Other judges, however, continue to utilize advisors in only extreme cases, as *TechSearch* advises.¹⁶⁰

2. *Neutral Testifying Experts Under Federal Rule of Evidence 706*

Under Federal Rule of Evidence 706, a court may appoint experts to testify to the jury, either “[o]n a party’s motion or on its own.”¹⁶¹ The court may ask the parties for nominations and choose an expert that the parties agree on, or it may appoint an expert of its own choosing.¹⁶² The court may also choose to disclose to the jury the fact that the court appointed the expert witness.¹⁶³ Rule 706 witnesses may be deposed by the parties, called to testify by the court or a party, and cross-examined by the parties,¹⁶⁴ thereby increasing transparency in the process.¹⁶⁵

The Federal Circuit has held that the use of testifying experts is sometimes permissible. In *Monolithic Power Systems, Inc. v. O2 Micro International Ltd.*, the Federal Circuit considered whether such experts violate the Seventh Amendment right to a trial by jury.¹⁶⁶ The Northern District of California judge found the electrical engineering technology at issue to be “extremely difficult to understand” and maintained that the jury would be confused.¹⁶⁷ The judge appointed a testifying expert, notwithstanding plaintiff O2’s objections.¹⁶⁸ The judge instructed the jury that the expert was “an independent witness retained by the parties jointly at the court’s direction to assist in explaining the technology at issue in this

Rodney Gilstrap) (discussing his use of technical advisors).

159. *Id.*

160. *Tips from the Bench*, *supra* note 156.

161. FED. R. EVID. 706(a).

162. *Id.*

163. *Id.* 706(d).

164. *Id.* 706(b).

165. Rai, *supra* note 23, at 893.

166. 558 F.3d 1341, 1347 (2009).

167. *Id.* at 1345 (quoting Transcript of Hearing at 35:3-8, *Monolithic Power Sys., Inc. v. O2 Micro Int’l Ltd.*, Nos. C 04-2000 CW, C 06-2929 CW, 2007 WL 3231709 (N.D. Cal. Oct. 30, 2007)) (“And the notion that a jury is going to understand it, to me, is foolishness. You can talk for months and the jury isn’t really going to understand this in the sense of being able to make a reasoned, rational decision about it.”).

168. *Id.* at 1345-46.

case.”¹⁶⁹ The expert’s testimony supported defendant Monolithic Power Systems, and the jury returned a verdict in its favor.¹⁷⁰ O2 appealed, arguing that the court’s use of a testifying expert violated the Seventh Amendment.¹⁷¹

Applying Ninth Circuit case law and *TechSearch*, the Federal Circuit affirmed the district court.¹⁷² Although it maintained that Rule 706 experts “should be invoked only in rare and compelling circumstances,” the Federal Circuit noted that Ninth Circuit law provides judges with “wide latitude to make these appointments.”¹⁷³ The court consequently held that the district court did not abuse its discretion, given that the case was “unusually complex” and that there “appeared to be starkly conflicting expert testimony.”¹⁷⁴

The use of such experts remains rare. Notwithstanding *Monolithic Power Systems*, several judges have expressed concern that testifying experts can unduly influence the jury and undermine a party’s right to a trial by jury.¹⁷⁵ Moreover, as with nontestifying experts, there is also an issue with regard to the parties having to share the cost of the expert.¹⁷⁶

3. *Special Masters*

Under Federal Rule of Civil Procedure 53, a district judge may appoint a special master to “perform duties consented to by the parties,” “hold trial proceedings and make or recommend findings of fact on issues to be decided without a jury” in certain circumstances, or to “address pretrial and posttrial matters that cannot be effectively and timely addressed” by the judge.¹⁷⁷ Rule 53(c) gives the special master authority to conduct evidentiary hearings and

169. *Id.* at 1346 (quoting Transcript of Trial at 96:21-24, *Monolithic Power Sys., Inc.*, 2007 WL 3231709).

170. *Id.* at 1345-46.

171. *Id.* at 1347.

172. *Id.* at 1346, 1348.

173. *Id.* at 1348.

174. *Id.*

175. See Salvatore, *supra* note 157 (statements of Hon. William Young and Hon. William Conley) (expressing concern that having a neutral expert testify to a jury can unduly influence the jury’s decision).

176. FED. R. EVID. 706(c)(2).

177. FED. R. CIV. P. 53(a)(1).

take and record evidence.¹⁷⁸ When the special master issues a recommendation or order, the parties have an opportunity to appeal it to the court.¹⁷⁹ All questions of law are reviewed de novo, as are questions of fact unless the parties stipulate otherwise.¹⁸⁰ Under no circumstance may the special master usurp the role of the judge.¹⁸¹

In unusually complex patent cases,¹⁸² special masters are used in various areas, including claim construction, validity, infringement, and discovery.¹⁸³ They tend to be attorneys specializing in patent law with technical degrees and years of experience.¹⁸⁴ In patent cases, they typically write reports or make recommendations with regard to claim construction, discovery, or both, though sometimes they also opine on summary judgment motions.¹⁸⁵ In addition to appointing special masters under Rule 53, judges can also use their inherent authority or Federal Rule of Evidence 706 to hire them.¹⁸⁶

Special masters, however, are seldom used in patent cases.¹⁸⁷ Judges may be reluctant to use special masters without both parties' consent because the parties typically share the cost.¹⁸⁸ Due

178. *Id.* 53(c).

179. *Id.* 53(f)(1).

180. *Id.* 53(f)(3). The parties may agree for findings of fact to be reviewed for clear error or may decide the special master's findings of fact are final. *Id.*

181. *See* *Kimberly v. Arms*, 129 U.S. 512, 524 (1889) (observing that a court may not use a special master to “abdicate its duty to determine by its own judgment the controversy presented”).

182. *See* JAY P. KESAN & GWENDOLYN G. BALL, FED. JUD. CTR., A STUDY OF THE ROLE AND IMPACT OF SPECIAL MASTERS IN PATENT CASES 9 (2009), <https://www.fjc.gov/sites/default/files/2012/SpecMaPa.pdf> [<https://perma.cc/E7RF-P349>] (observing that “in most cases, the special master was appointed after the parties realized that the case was highly complex and the issues difficult to resolve between the parties” and noting that, on average, cases had “been ongoing for 1,100 days when the special master [was] appointed”).

183. *See* *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki, Co.*, 72 F.3d 857, 866 (Fed. Cir. 1995), *vacated and remanded on other grounds*, 520 U.S. 1111 (1997) (holding that the use of a special master did not deprive the parties of a right to a trial by jury); *In re Newman*, 763 F.2d 407, 409 (Fed. Cir. 1985) (noting that “[t]he district court appointed a special master” because of “the substantial and contradictory submissions of record and the complicated issues of scientific and technical fact”).

184. KESAN & BALL, *supra* note 182, at 4-5.

185. *Id.* at 6.

186. Scheindlin, *supra* note 144.

187. Of the 5,500 patent cases that terminated in 2005 and 2006, only 116 utilized a special master—a rate of 2.1 percent. KESAN & BALL, *supra* note 182, at 1.

188. *See* Scheindlin, *supra* note 144 (“Parties typically share the costs of special masters, but some courts have assigned all costs to the party whose behavior in some way caused the need for the appointment. Or compensation can be paid from a common fund.”); David R.

to their infrequent use, coupled with the fact that cases utilizing them are unusually complex, it is difficult to assess how helpful special masters are.¹⁸⁹ Although there has been proposed legislation that would fund studying whether their use has been beneficial and should be expanded, such proposals have not gained traction.¹⁹⁰

To conclude, although independent technical expertise is theoretically available to district judges, many challenges prevent their use. As Part III notes, however, several European courts have developed a better way of providing expertise through the use of technically trained judges.

III. EUROPE'S TECHNICALLY QUALIFIED JUDGES

As in the United States, several courts in Europe feature judges with legal expertise in patents.¹⁹¹ But what differentiates courts in several EU member states is their use of TQJs, who generally lack law degrees and are hired for their scientific or technical knowledge.¹⁹² TQJs work alongside their legal counterparts and are assigned only to cases that involve technology that they have expertise in.¹⁹³ Section A examines the use of TQJs in Germany, Switzerland, and the proposed Unified Patent Court. Section B then considers the advantages and disadvantages of utilizing TQJs.

Cohen, *Special Masters Versus Magistrate Judges: No Contest*, 61 FED. LAW. 73, 75 (2014) (observing that parties typically split the cost of a special master).

189. KESAN & BALL, *supra* note 182, at 10-11.

190. See Neil A. Smith, *Complex Patent Suits: The Use of Special Masters for Claim Construction*, 2 LANDSLIDE 36, 37 (2009) (discussing section 16 of H.R. 1260, 111th Cong. (2009), which proposed a study of special masters in patent litigation).

191. See ALEXANDER HARGUTH WITH STEVEN CARLSON, PATENTS IN GERMANY AND EUROPE 2 (2011).

192. See Christian Osterrieth, *Patent Enforcement in Germany*, in PATENT ENFORCEMENT WORLDWIDE 111, 122 (Christopher Heath ed., 3d ed. 2015) (discussing Germany's use of TQJs in Federal Patent Court).

193. See *id.*

A. European Courts Utilizing Technically Qualified Judges

1. The German Federal Patent Court

Germany is a major hub for patent litigation, with close to eight hundred cases filed in 2018 alone.¹⁹⁴ It is a preferred EU country to litigate in, because proceedings are regarded as fast and cheap, and injunctions are always awarded upon a finding of infringement.¹⁹⁵

Patent litigation in Germany is bifurcated between infringement and validity claims.¹⁹⁶ Infringement cases are heard in one of twelve regional courts,¹⁹⁷ with each trial court having at least one specialized patent chamber, allowing patent cases to be heard by judges who develop legal expertise in the field.¹⁹⁸ Several German regional courts are regarded as experts in patent infringement cases; the Düsseldorf court is the most popular with patent litigants, followed by the Mannheim and Munich courts.¹⁹⁹ The German Federal Patent Court (German FPC) has exclusive jurisdiction over validity

194. See Schönbohm et al., *supra* note 27, at 108.

195. See *id.*; HARGUTH WITH CARLSON, *supra* note 191, at 2-3 (discussing the speed and low cost of German patent litigation). Note, however, that pretrial discovery is limited and damages are far more modest compared to those in the United States. *Id.*

196. Schönbohm et al., *supra* note 27, at 110.

197. Christian Helmers, *The Economic Analysis of Patent Litigation Data 6* (World Intell. Prop. Org., Working Paper No. 48, 2018), <https://www.wipo.int/publications/en/details.jsp?id=4370&plang=EN> [<https://perma.cc/NGY8-3AG4>]; Katrin Cremers, Max Ernicke, Fabian Gaessler, Dietmar Harhoff, Christian Helmers, Luke McDonagh, Paula Schliessler & Nicolas van Zeebroeck, *Patent Litigation in Europe*, 44 EUR. J.L. & ECON. 1, 5 (2016) (discussing the jurisdiction of regional circuit courts over patent infringement cases).

198. See Osterrieth, *supra* note 192, at 122 (discussing how patent chamber judges gain technical experience and knowledge by working on many patent cases); Matthias Ricker & Philipp Neels, *Find and Share the Knowledge: Germany*, PAT. LAW., May/June 2015, at 41. Note that the Mannheim and Munich courts have two patent chambers, and the Düsseldorf court has three. Alexander Harguth, *Patent Disputes: Guide for Patent Litigation in Germany*, PREU BOHLIG & PARTNER 6 (2016), <https://pdfs.semanticscholar.org/3bbf/72a98fef53c029ed8ecc2ac1f1aa38c40282.pdf> [<https://perma.cc/M9FW-YQAQ>].

199. Mathieu Klos, *Decline in Cases at German Patent Courts*, JUVE PAT. (July 12, 2019), <https://www.juve-patent.com/market-analysis-and-rankings/courts-and-patent-offices/decline-in-cases-at-german-patent-courts/> [<https://perma.cc/CUM8-57RV>]. Cases from these courts appeal first to a court of appeals and then to the Federal Supreme Court. Katrin Cremers, Fabian Gaessler, Dietmar Harhoff, Christian Helmers & Yassine Lefouili, *Invalid but Infringed? An Analysis of the Bifurcated Patent Litigation System*, 131 J. ECON. BEHAV. & ORG. 218, 221 (2016).

disputes (which are called “nullity proceedings”) and appeals from the German Patent and Trademark Office.²⁰⁰

The real innovation of the German system comes from the German FPC’s use of nonlawyer TQJs. Under section 65 of the German Patent Act, judges on the German FPC may be either legally trained “or have expertise in a field of technology.”²⁰¹ Consequently, more than half of the court’s 102 judges are technically qualified.²⁰² TQJs must possess a technical master’s degree or equivalent, and have at least five years of work experience in their relevant fields.²⁰³ All of the TQJs are former patent examiners who each have at least five to seven years of experience there.²⁰⁴ They are therefore highly knowledgeable about patent law, notwithstanding their lack of a law degree.²⁰⁵ TQJs are treated as equals to LQJs: they receive lifetime appointments on the bench, share the same benefits, and generally have the same duties.²⁰⁶

German FPC judges are subdivided into seven different types of “boards”—three of which relate to patents.²⁰⁷ The six nullity boards consider challenges to patent validity; three of the five judges on each of the nullity boards are technically qualified.²⁰⁸ The ten technical boards of appeal hear appeals of patent application rejections;²⁰⁹ their panels contain one LQJ and three TQJs.²¹⁰ The

200. See FABIAN GAßLER, ENFORCING AND TRADING PATENTS 65 (2016) (discussing the bifurcation of validity and litigation proceedings in the German national court system).

201. Patentgesetz [PatG] [Patent Act], Dec. 16, 1980, BUNDESGESETZBLATT, Teil I [BGBl I] at 24, § 65, last amended by Gesetz [G], Oct. 8, 2017, BGBl I at 3546 (Ger.), http://www.gesetze-im-internet.de/englisch_patg/ [<https://perma.cc/A6LS-Y5KX>].

202. *The Court: Organisation*, BUNDESPATENTGERICHT, https://www.bundespapentgericht.de/EN/TheCourt/Organisation/organisation_node.html [<https://perma.cc/5TRL-3V5V>].

203. Patentgesetz [PatG] [Patent Act], Dec. 16, 1980, BGBl I at 10, § 26.

204. Schmidt, *supra* note 18, at 110.

205. *See id.*

206. *Id.*

207. *The Court: Organisation*, *supra* note 202 (“The Federal Patent Court adjudicates in a total of 25 boards ... : 6 nullity boards, 1 juridical board of appeal and nullity board, 10 technical boards of appeal, 5 boards of appeal for trade marks, 1 board of appeal for trade marks and designs, 1 board of appeal for utility models, and 1 board of appeal in plant variety cases.”).

208. *See* Schmidt, *supra* note 18, at 111.

209. *The Court: Organisation*, *supra* note 202 (noting there are ten technical boards of appeal).

210. *See The Federal Patent Court*, BUNDESPATENTGERICHT 10 (2012) [hereinafter *German FPC Brochure*], https://www.bundespapentgericht.de/SharedDocs/Downloads/EN/Infobrochures/InfobrochureE_download.pdf [<https://perma.cc/75UJ-N7R9>]. In the event of a tie, the legally

single judicial board of appeal contains three LQJs.²¹¹ It hears, among other things, requests from the German Patent and Trademark Office to determine administrative and coercive measures against witnesses or experts, challenges against judges, and appeals regarding the determination of costs.²¹²

Because expertise is integrated into the German judicial system, the German FPC is not dependent upon outside experts for validity proceedings.²¹³ If a validity case involves “technically complex” facts that the TQJs lack expertise in, the Board is expected to request an expert opinion.²¹⁴ However, this is uncommon, given that TQJs are experts in their respective technical fields.²¹⁵

It is important to note that the German system has limitations. Part of its popularity is driven by its use of bifurcated litigation, which makes it difficult and costly for defendants in infringement proceedings to challenge the validity of the patent claims at issue, leading to fewer such challenges.²¹⁶ Regional courts are generally reluctant to stay an infringement proceeding pending a validity challenge in the German FPC, which, in the past, led to patentees receiving injunctions for patents that were found to be invalid years later.²¹⁷ Also, the fact that a law degree is an undergraduate degree

trained presiding judge decides the case. *Id.*

211. *Id.*

212. *Id.*

213. *See* Schmidt, *supra* note 18, at 110 (noting that the TQJs’ expertise generally covers all fields, such that the court rarely needs outside experts).

214. GÄBLER, *supra* note 200, at 20.

215. *German FPC Brochure*, *supra* note 210, at 1 (observing that because TQJs “are experts in one particular technical field, the Federal Patent Court generally has no need to call in external experts”).

216. *See* Cremers et al., *supra* note 199, at 235-36 (noting that the bifurcated system contributes to Germany’s reputation as a patent-friendly jurisdiction); Helmers, *supra* note 197, at 5 (noting that evidence suggests “a bifurcated system, in which infringement is usually decided first, leads to fewer validity challenges than in a unified system” and that “infringement actions are more likely to settle”); Cremers et al., *supra* note 197, at 12 (observing that bifurcation “creates the problem that an infringement court might issue an injunction against a defendant on the basis of a broad claim construction which would inevitably lead to the invalidation in view of a certain piece of prior art”); Osterrieth, *supra* note 192, at 111-12 (noting that a patent can be enforced even when there is an open question regarding validity). Although the civil court can stay the proceeding pending a validity determination, this happens only if the court believes there is a high likelihood of invalidity. *Id.* at 112.

217. Schönbohm et al., *supra* note 27, at 110-12, 124. Note that the German government is currently working on reforming the system so that a qualified opinion on patent validity

in Germany means that the country had to adopt a system that was not dependent upon lawyers who possess technical degrees.²¹⁸ Unlike in the United States, a German patent attorney (Patentanwalt) is not a lawyer, but rather, a scientist or engineer who possesses some legal training and has limited powers.²¹⁹

These issues, however, do not detract from the fact that the use of TQJs appears to improve the German FPC's ability to decide patent cases. Because specialized judges hear validity cases, they acquire experience in construing claims, which increases certainty in patent litigation.²²⁰ The German FPC was successful enough that it served as a model for the Swiss Federal Patent Court (Swiss FPC) and the proposed UPC, which are discussed in turn below.

2. *The Swiss Federal Patent Court*

Prior to 2012, Switzerland's twenty-six cantons each had a trial court that heard cases in a variety of subject areas, including patents.²²¹ Because four urban cantons heard the majority of patent disputes, most of the Swiss canton courts had little patent experience,²²² with many judges hearing only one or two patent cases in their entire career.²²³ Even the courts that had a relatively high volume of patent cases were not regarded as being particularly skillful, given that there are only fifteen to twenty Swiss patent

is available within six months of filing a nullity proceeding. See Mathieu Klos, *German Government Wants to Change Patent Law*, JUVE PAT. (Jan. 15, 2020), <https://www.juve-patent.com/news-and-stories/legal-commentary/german-government-wants-to-change-patent-law/> [<https://perma.cc/S8Z9-9P52>].

218. See generally Jochen Lehmann, *Regulation of the Legal Profession in Germany: Overview*, THOMSON REUTERS PRAC. L., <https://uk.practicallaw.thomsonreuters.com/2-638-8145> [<https://perma.cc/Q6N7-PWAB>]; Selina Grün, *The German vs. the American Law School Experience*, LIFE AT NYU L. (Dec. 15, 2015), <https://blogs.law.nyu.edu/lifeatnyulaw/the-german-vs-the-american-law-school-experience/> [<https://perma.cc/VKN3-2EFC>].

219. See Lehmann, *supra* note 218.

220. See Cremers et al., *supra* note 197, at 12 (noting that TQJs “facilitat[e] coherent and well-founded claim construction and therefore increase legal certainty regarding the validity of patents”).

221. Hess, *supra* note 19, at 275.

222. The commercial courts of Zurich, Argovia, Saint-Gall, and Berne heard the majority of patent cases prior to 2012. *Id.*

223. Lutz, *supra* note 142, at 323.

cases a year.²²⁴ The lack of consistency among the different cantons predictably led to forum shopping.²²⁵

Swiss law forbids courts from relying on party experts for technical information,²²⁶ which meant that the generalist canton courts relied upon neutral experts.²²⁷ This led to some judges delegating decision-making to a court-appointed neutral expert, whose findings were granted undue deference.²²⁸ As attorney Martin Lutz noted: “The almost blind reliance on the findings of the court expert ... is almost inevitable if the court lacks the technical knowledge to evaluate the conclusions of the expert and the criticism that the parties may present.”²²⁹ Lutz further noted “that even a largely erroneous and unfounded court expert opinion [was] likely to be accepted as the basis of the decision” by the canton judges.²³⁰

To address these problems, Switzerland amended its constitution and subsequently passed the Federal Patent Court Act, establishing the Swiss FPC.²³¹ Unlike Germany’s bifurcated system, the Swiss FPC has nationwide jurisdiction over both validity and infringement disputes, and has concurrent jurisdiction with canton courts for disputes arising out of patent licensing agreements.²³² The court’s

224. *Id.*

225. Felix Addor & Claudia Mund, *The Swiss Federal Patent Court: A Model to Follow?*, in WHAT PATENT LAW FOR THE EUROPEAN UNION?, *supra* note 18, at 159, 161 (discussing how the “fragmentation of the patent litigation system” led to “forum shopping, patent torpedoes and costly expert disputes in Switzerland”).

226. Cyrill P. Rigamonti, *Swiss Patent Jurisprudence 2012*, 4 J. INTELL. PROP. INFO. TECH. & ELEC. COM. L. 53, 60 n.4 (2012).

227. *Id.* at 53.

228. Lutz, *supra* note 142, at 323. This problem occurs outside patent law as well. See EUR. COMM’N FOR THE EFFICIENCY OF JUST., STUDY ON THE ROLE OF EXPERTS IN JUDICIAL SYSTEMS OF THE COUNCIL OF EUROPE MEMBER STATES 4 (2014) (discussing several examples of European courts overly relying on neutral experts).

229. Lutz, *supra* note 142, at 323.

230. *Id.* The problem of canton judges overly relying on neutral experts parallels the concerns expressed by the Federal Circuit in *TechSearch*. See *supra* Part II.C.1.

231. Hess, *supra* note 19, at 275.

232. *Id.*; BUNDESGESETZ ÜBER DAS BUNDESPATENTGERICHT [PATENTGERICHTSGESETZ, PATGG] [Federal Act on the Federal Patent Court] Mar. 20, 2009, SR 173.41, art. 26 (Switz.) [hereinafter Swiss Patent Court Act], <https://www.admin.ch/opc/en/classified-compilation/20071763/index.html> [<https://perma.cc/NB9E-BV7M>]. The court also has jurisdiction over patent disputes arising from Liechtenstein. Treaty Between the Swiss Confederation and the Principality of Liechtenstein on Patent Protection, Liech.-Switz., art. 1, Dec. 22, 1978, OJ EPO 1980, 407, <https://www.epo.org/law-practice/legal-texts/official-journal/2016/etc/se4/p511.html> [<https://perma.cc/E3TE-6X7N>].

design is unusual, in that it relies heavily upon part-time judges: the court is comprised of twenty-seven technically trained part-time judges, thirteen legally trained part-time judges, and only two permanent judges (including the President of the Swiss FPC).²³³ The Swiss FPC calls upon and pays these part-time judges on a case-by-case basis.²³⁴ The TQJs possess expertise in physics, chemistry, biology, electrical engineering, computer science, medicine, and mechanical engineering,²³⁵ which reduces the need for outside neutral experts.²³⁶ Trial-level patent proceedings are heard by panels of three judges: one TQJ, one LQJ, and one legally qualified permanent judge.²³⁷

The Swiss system does have several drawbacks. Because all of the part-time judges are employed elsewhere—frequently as practicing lawyers or European patent attorneys—the court must mitigate conflicts of interest.²³⁸ This is particularly problematic when large multinational companies are litigating. Judges also are elected by the Swiss parliament for a mere six-year renewable term, as opposed to lifetime appointments.²³⁹ Furthermore, the President of the FPC selects the panels,²⁴⁰ which could theoretically allow the President to influence the outcome of the decision through panel selection—a problem that has been seen in the United States in PTAB proceedings.²⁴¹

233. *About the Court: Judges*, BUNDESPATENTGERICHT, <https://www.bundespatentgericht.ch/en/about-the-court/judges/> [<https://perma.cc/CSG9-7ARW>] (providing a roster of Swiss FPC judges). Two of the legally trained judges are also technically trained. *Id.*

234. Rigamonti, *supra* note 226, at 53; Hess, *supra* note 19, at 276.

235. *About the Court: Judges*, *supra* note 233. Twelve of the twenty-seven judges have chemistry degrees, nine have physics degrees, and the remainder are trained in biology, medicine, mechanical engineering, and electrotechnology (electrical engineering). *Id.*

236. Rigamonti, *supra* note 226, at 57, 60; *see also* Swiss Patent Court Act, *supra* note 232, art. 37(3) (“Where a technically trained judge possesses specific expertise, the judge’s expert opinion shall be entered in the court record. The parties shall be given an opportunity to submit their position on the court record.”).

237. Fritz Blumer, *Patent Enforcement in Switzerland*, in PATENT ENFORCEMENT WORLDWIDE, *supra* note 192, ¶ 9, at 258. Note that some judges are dual-qualified.

238. *Id.* ¶ 8, at 257.

239. Addor & Mund, *supra* note 225, at 164.

240. REGELUNGEN ZUM BUNDESPATENTGERICHT [PR-PatC] [Regulations on the Federal Patent Court] Sept. 28, 2011, art. 3(e) (Switz.), https://www.bundespatentgericht.ch/fileadmin/web-dateien/014.221_Geschaeftsreglement_fuer_das_Bundespatentgericht_EN_per_121212.pdf [<https://perma.cc/58WJ-WAXR>].

241. If the Director of the Patent and Trademark Office is unhappy with the outcome of a

3. *The Unified Patent Court*

Although an EU-wide patent is available from the European Patent Office, patent holders that wish to enforce their rights must do so on a country-by-country basis.²⁴² This leads to wasteful duplicative proceedings and divergent judgments, and may ultimately hinder innovation.²⁴³ To solve these problems, a uniform patent court system has been proposed. The Agreement on a Unified Patent Court (UPCA) is an international treaty that, if ratified,²⁴⁴ would create the Unified Patent Court (UPC)—a court with

case, he or she can order a rehearing and designate two like-minded members of the PTAB to serve on the expanded panel. This practice is known as “panel stacking.” See Christopher J. Walker & Melissa F. Wasserman, *The New World of Agency Adjudication*, 107 CALIF. L. REV. 141, 178-79 (2019) (discussing the Director’s use of panel stacking).

242. See DIETMAR HARHOFF, ECONOMIC COST-BENEFIT ANALYSIS OF A UNIFIED AND INTEGRATED EUROPEAN PATENT LITIGATION SYSTEM 7 (2009), https://www.researchgate.net/publication/267839173_Economic_Cost-Benefit_Analysis_of_a_Unified_and_Integrated_European_Patent_Litigation_System [<https://perma.cc/YMX8-6YTV>] (discussing the lack of “a unified and integrated patent litigation system”); Clement Salung Petersen & Jens Schovsbo, *Decision-Making in the Unified Patent Court: Ensuring a Balanced Approach*, in INTELLECTUAL PROPERTY AND THE JUDICIARY, *supra* note 96, at 231, 231 (noting that the UPC will have “exclusive competence to hear most actions concerning European patents (with or without unitary effect)” and “will become the new judiciary for litigation relating to infringement and validity of such patents in most of Europe”).

243. See HARHOFF, *supra* note 242, at 15.

244. Under the original terms of the UCPA, the UPC will not be established unless the three largest patent-granting states at the time—Germany, the United Kingdom, and France—ratify the UPCA. *United Kingdom Ratifies Unified Patent Court Agreement*, EPO (Apr. 26, 2018), <https://www.epo.org/news-issues/news/2018/20180426.html> [<https://perma.cc/8GDS-BFCU>]. Although the United Kingdom and France ratified the UPCA, Germany did not, due to a court decision invalidating its first attempt to ratify the agreement. See Mathieu Klos, *Germany Hastens Second Ratification of Unified Patent Court*, JUVE (Oct. 2, 2020), <https://www.juve-patent.com/news-and-stories/legal-commentary/germany-hastens-second-ratification-of-unified-patent-court/> [<https://perma.cc/FBG3-JP5F>]. As of late 2020, the UPCA has passed both houses of the German parliament, but it is still possible that a second legal action will be filed against it. *German Bundesrat Approves Ratification of Unified Patent Court Agreement*, WOLTERS KLUWER: KLUWER PAT. BLOG (Dec. 18, 2020), <http://patentblog.kluweriplaw.com/2020/12/18/german-bundesrat-approves-ratification-of-unified-patent-court-agreement/> [<https://perma.cc/YZC4-DTG3>]. Questions also exist regarding how the United Kingdom’s withdrawal from the UPCA and EU will impact the UPC’s future. See Heidi Hurdle, *Unitary Patent—Back in Business?*, FIELDFISHER (Dec. 3, 2020), <https://www.fieldfisher.com/en/services/intellectual-property/intellectual-property-blog/unitary-patent-back-in-business> [<https://perma.cc/73A2-YA6H>].

exclusive jurisdiction over the litigation of disputes pertaining to European and Unitary patents.²⁴⁵

The UPC will make extensive use of TQJs, who must meet several requirements. Like all UPC judges, the TQJs are required to “have proven experience in the field of patent litigation,”²⁴⁶ have nationality in an EU member state, and “a good command of at least one official language of the European Patent Office.”²⁴⁷ They must also be geographically diverse to the extent possible²⁴⁸ and have nationality in an EU member state.²⁴⁹ Furthermore, TQJs must possess a technical undergraduate degree, experience in a technological field, and knowledge of patent-related civil law and procedure.²⁵⁰

UPC trial courts will be divided into central division, local, and regional courts.²⁵¹ Three central division courts will each hear cases in a different area of technology,²⁵² with panels comprising one TQJ and two LQJs.²⁵³ Individual countries may also choose to set up local divisions or join with other countries to create regional divisions.²⁵⁴ Local and regional divisions will use three LQJs on panels by default,²⁵⁵ though a TQJ will be used if a party or the panel requests

245. Agreement on a Unified Patent Court (UPCA), arts. 1, 32(1) (proposed treaty), <https://www.unified-patent-court.org/sites/default/files/upc-agreement.pdf> [<https://perma.cc/J4DN-CDYD>] (establishing the UPC “for the settlement of disputes relating to European patents and European patents with unitary effect” and discussing the UPC’s exclusive jurisdiction).

246. *Id.* art. 15(1).

247. *Id.* annex I, art. 2(2) (Statute of the Unified Patent Court (SUPC)).

248. *Id.* annex I, art. 3(3) (SUPC).

249. *Id.* annex I, art. 2(1) (SUPC).

250. *Id.* art. 15(3). To gain knowledge of the UPC Rules of Procedure and the substantive law under the UPCA, there are training programs available, such as that at the University of Strasbourg’s Center for International Intellectual Property. *Update Modules on the Unified Patent Court*, CTR. FOR INT’L INTELL. PROP. STUD. (2020), <http://www.ceipi.edu/en/patent-litigation-in-europe-unified-patent-court/update-modules-on-the-unified-patent-court/> [<https://perma.cc/8YWR-KLYJ>].

251. UPCA, *supra* note 245, art. 8(1)-(2).

252. Originally, London, Paris, and Munich were to host the central divisions. *Id.* art. 7(2). Because of Brexit, it now appears that the Paris and Munich courts will initially split the workload for the London court until a third central division host can be selected. *See* Klos, *supra* note 244.

253. *See* UPCA, *supra* note 245, art. 7(2) (noting the locations of the central divisions); *id.* art. 8(6).

254. *Id.* art. 7(3)-(5).

255. *Id.* art. 8(2)-(3).

one.²⁵⁶ The Court of Appeals in Luxembourg will hear all appeals and will sit in panels comprising three LQJs and two TQJs.²⁵⁷

There are several notable features of the UPC. First, although LQJs and full-time TQJs will be assigned to a particular court, the group as a whole will participate in a “Pool of Judges” (along with part-time TQJs).²⁵⁸ These judges may be staffed onto cases in any local or regional division panel as needed, and TQJs can also be staffed onto Court of Appeals panels.²⁵⁹ To ensure breadth of experience, local divisions that average less than fifty patent cases a year may use only one local LQJ, and those that hear an average of fifty or more cases a year will be permitted two LQJs.²⁶⁰ This should ensure that skilled judges are involved in every trial court case and provide an opportunity for less-skilled judges to gain experience. Additional judges for panels in such cases will come from the Pool.²⁶¹

Second, UPC judges will possess far more power than their U.S. counterparts. The UPCA creates an Administrative Committee, which can amend the agreement to improve the functioning of the court or to comply with international agreements relating to patents under EU law.²⁶² However, amendments on any other ground appear to require consensus from all of the UPC members.²⁶³ This means that unlike the U.S. court system, in which Congress can override patent decisions somewhat easily, UPC decisions may be difficult to dismantle.²⁶⁴

256. *Id.* art. 8(5).

257. *Id.* art. 9(1).

258. *Id.* art. 18(2).

259. *Id.*

260. *Id.* art. 8(2)-(3).

261. *Id.*

262. *Id.* art. 87(1)-(2).

263. *See id.* art. 87(1)-(3); Thorsten Bausch, *More Exciting Than You May Think: How Germany Intends to Implement the UPC Agreement (UCPA)*, WOLTERS KLUWER: KLUWER PAT. BLOG (Mar. 6, 2016), <http://patentblog.kluweriplaw.com/2016/03/06/more-exciting-than-you-may-think-how-germany-intends-to-implement-the-upc-agreement-upca/> [<https://perma.cc/3PYS-UUKD>] (discussing how a participating country may object to a UPCA amendment, implying “that changes to the law must also be reviewed and approved by the lawmaker”).

264. *Compare* KEVIN T. RICHARDS, CONG. RSCH. SERV., LSB10344, JUDGES URGE CONGRESS TO REVISE WHAT CAN BE PATENTED 4 (2020), <https://crsreports.congress.gov/product/pdf/LSB/LSB10344> [<https://perma.cc/UR44-LAH4>] (indicating that Congress is “the central avenue for revisions” for certain patent decisions), *with* UPCA, *supra* note 245, art. 87 (outlining the process for objecting to amendments in the UPC).

Although the UPC is not yet in force, it has the potential to remedy many of the problems that the U.S. judicial system currently experiences. Independent technical expertise will be integrated at the trial and appellate level, which should aid the judges in making accurate decisions. Although there are some disadvantages to using TQJs, discussed below, the UPC should be an improvement over the status quo in the EU.

B. Benefits and Drawbacks of Technically Trained Judges in Patent Litigation

There are several advantages to courts utilizing mixed panels of TQJs and LQJs. As the German FPC President Beate Schmidt has noted, “[l]egally trained judges can ask questions concerning the technical content of a patent any time,” because expert TQJs “who know the facts of the case and the patent law are always at hand.”²⁶⁵ This ensures that the panel understands relevant technical facts in an efficient manner and promotes accuracy and predictability.²⁶⁶ LQJs can, in turn, explain complicated legal issues to the TQJs.²⁶⁷ Unlike party experts, TQJs are independent and impartial,²⁶⁸ meaning that LQJs do not have to waste time sifting through competing accounts of relevant technology. This combination of technical and patent expertise on panels may promote better decision-making.²⁶⁹

TQJs also reduce the court’s dependency on outside technical experts—who are expensive, time-consuming to find, and potentially biased.²⁷⁰ As Schmidt observed, because outside experts are not

265. Schmidt, *supra* note 18, at 111.

266. STEFAN LUGINBUEHL, EUROPEAN PATENT LAW: TOWARDS A UNIFORM INTERPRETATION 230-31 (Edward Elgar ed., 2011) (discussing how TQJs are an efficient way to ensure the panel understands relevant technical facts); Beate Schmidt, President, Fed. Pat. Ct., Technically Trained Judges in Germany, Presentation at The University of Strasbourg 23-24 (Apr. 27, 2019) [hereinafter Schmidt Presentation] (slides with author).

267. LUGINBUEHL, *supra* note 266, at 231-32.

268. Schmidt Presentation, *supra* note 266, at 13, 26.

269. See Seuba, *supra* note 96, at 278 (“Technical judges foster coherence in the jurisprudence, reduce factual errors, contribute to clearly identifying the issues of relevance in the case, and lead to more reasoned and practical decisions.”); Schmidt, *supra* note 18, at 111 (maintaining that the use of TQJs “is a perfect way to improve the quality of decisions”).

270. See Gäbler, *supra* note 200, at 88 (discussing how utilizing technically trained FPC judges lowers the cost of litigation by reducing the need for outside experts); Hans-Georg

involved in the actual decision-making, they do not have to take responsibility for their opinions.²⁷¹ Germany's system of hiring former patent examiners as TQJs could also help with the retention of talented technically trained patent examiners by providing them with a career path.²⁷²

Perhaps the greatest advantage of courts utilizing TQJs is that it makes technical expertise the norm, guaranteeing that in every case there will be "a thorough examination of the technical merits" for the relevant claims.²⁷³ Suppose that a judge presiding over a patent case encounters unfamiliar technology and needs assistance understanding it. Under the current U.S. system, the judge must establish that the case at issue is technically complex, locate a suitable expert, and justify the cost being passed on to the parties.²⁷⁴ By contrast, a German FPC judge merely needs to ask one of the TQJs working on the same case to explain it.²⁷⁵ The judge may feel more comfortable asking a peer such a question, as opposed to an outside party.

Admittedly, there are some disadvantages associated with the use of technical judges. To be effective, a court must hire judges with a variety of technical backgrounds, so that judges work only on cases in their areas of expertise.²⁷⁶ This can be expensive, especially if there are technological areas in which not many cases are heard.²⁷⁷

Landfermann, *Nonobviousness in German Patent Nullity Proceedings*, in PATENTS AND TECHNOLOGICAL PROGRESS IN A GLOBALIZED WORLD 31, 32 (Wolrad Prinz au Waldeck und Pymont et al. eds., 2009) ("The inclusion of Technical Judges in the Nullity Senates of this court allows a decision without external experts; by this, the proceedings become cheaper and quicker."); *German FPC Brochure*, *supra* note 210, at 1 (noting that because TQJs are able to provide needed expertise, it "leads to proceedings being cost-effective and swift" compared to using neutral outside experts).

271. Schmidt Presentation, *supra* note 266, at 26.

272. *Id.* at 12.

273. Schmidt, *supra* note 18, at 111.

274. See FED. R. EVID. 706(a), (c)(2); Mark J. Feldstein, Shana K. Cyr & Kelly S. Horn, *Experts in Patent Cases: A Three-Part Examination of Federal Rules of Evidence 701-706—Part III*, FINNEGAN (June 2018), <https://www.finnegan.com/en/insights/articles/experts-in-patent-cases-a-three-part-examination-of-federal-rules-of-evidence-701706-part-iii.html> [<https://perma.cc/J3HL-9STC>].

275. Schmidt, *supra* note 18, at 111.

276. See *id.* at 112 (noting that technical judges should sit only in cases that they have technical expertise in).

277. Seuba, *supra* note 96, at 280; Jacques de Werra, *Specialised Intellectual Property Courts-Issues and Challenges*, in GLOBAL PERSPECTIVES AND CHALLENGES FOR THE

Although the courts can use part-time TQJs, they must be careful to avoid conflicts of interest if the judges hold other employment.²⁷⁸ Furthermore, neutral experts may still sometimes be needed if a legal question turns on highly specialized technology.²⁷⁹

In the context of the proposed UPC, some scholars have expressed concern that the use of technical judges may also contribute towards a bias in favor of “technology-based values.”²⁸⁰ Clement Petersen and Jens Schovsbo note that by valuing technical expertise too strongly, UPC judges may lack broader legal experience beyond patent law, which could give rise to institutional biases such as tunnel vision.²⁸¹ This concern is particularly acute for the UPC, given judges would be either legally or technically specialized in patent law at both the trial and appellate level.²⁸² Although the structure of the UPC gives the Administrative Committee discretion to hire judges with general judicial skills and nonpatent practical expertise,²⁸³ it is unclear if such knowledge will be valued by those conducting the hiring. To counterbalance these problems, some experts recommend that judges be made aware of potential biases stemming from the court’s design and be provided with broad legal training beyond just patent law.²⁸⁴

INTELLECTUAL PROPERTY SYSTEM 15, 26-27 (2016), http://www.ceipi.edu/fileadmin/upload/DUN/CEIPI/Documents/Publications_CEIPI__ICTSD/CEIPI_ICTSD_N_2.pdf [<https://perma.cc/UEA5-QQEA>].

278. Switzerland has strict guidelines for avoiding conflicts of interest with part-time judges. See Seuba, *supra* note 96, at 285. Nevertheless, given the small size of the country, it is likely difficult to avoid conflicts for litigation involving large corporations, given that many Swiss patent judges work in law firms. See *supra* note 238 and accompanying text.

279. LUGINBUEHL, *supra* note 266, at 232.

280. See Petersen & Schovsbo, *supra* note 242, at 232-33 (emphasis omitted).

281. *Id.* at 242-43.

282. See *German FPC Brochure*, *supra* note 210, at 10 (illustrating the specialization of the UPC’s appellate courts).

283. See UPCA, *supra* note 245, annex I, art. 3(3) (SUPC) (requiring the Administrative Committee to appoint judges with “the best legal and technical expertise”); Petersen & Schovsbo, *supra* note 242, at 242-43 (noting that the UPC judge qualification requirements include “generic judicial skills such as ‘work efficiency; cooperation abilities; writing skills; general judgement ability,’” as well as “judicial ethics, experience in meeting tight deadlines, oral communication skills, the capacity to work in a multinational and multilingual environment” and the like (quoting *Information on the Selection Process of Judges at the Unified Patent Court*, UNIFIED PAT. CT., https://www.unified-patent-court.org/sites/default/files/en_recruitment_information.pdf [<https://perma.cc/DTH9-LNCK>])).

284. See Jens Schovsbo, Thomas Riis & Clement Salung Petersen, *The Unified Patent Court: Pros and Cons of Specialization—Is There a Light at the End of the Tunnel (Vision)?*,

These concerns are similar to more general concerns regarding specialized courts.²⁸⁵ For example, scholars—including this one—have argued that the Federal Circuit is overly specialized and lacks the sufficient breadth that comes with a robust nonpatent docket.²⁸⁶ In the U.S. system, such a concentration of expertise in the judicial branch arguably undermines separation of powers.²⁸⁷

Another problem exists with regard to figuring out whether TQJs would work in the United States: a lack of data. In Germany, the votes of individual judges are not made public outside of the Federal Constitutional Court.²⁸⁸ Switzerland's 2012 switch to using TQJs²⁸⁹ may provide an opportunity to compare cases before and after the change. However, the switch was coupled with removing jurisdiction over patent cases from canton courts, making it difficult to determine what role technical specialization plays versus legal specialization.²⁹⁰ Consequently, any changes to the U.S. system to utilize TQJs should be preceded by a trial, to ensure that additional technical expertise brings expected benefits.

46 INT'L REV. INTELL. PROP. & COMPETITION L. 271, 274 (2015).

285. See, e.g., de Werra, *supra* note 277, at 28-29 (noting that specialized IP courts risk being “narrow” and could “neglect the overall legal and policy framework that surrounds certain IP disputes”); Dreyfuss, *supra* note 45, at 429 (noting dual trial court/appellate court specialization raises “[t]he possibility of doctrinal deviation” because of a lack of “generalist input” in the case).

286. See, e.g., Sapna Kumar, *Patent Court Specialization*, 104 IOWA L. REV. 2511, 2518-19 (2019) (discussing how the Federal Circuit has become more specialized over time, giving rise to various dysfunctions); Paul R. Gugliuzza, *Rethinking Federal Circuit Jurisdiction*, 100 GEO. L.J. 1437, 1498 (2012) (arguing in favor of giving the Federal Circuit nonexclusive jurisdiction over a broader cross section of cases to give Federal Circuit judges a more generalist perspective).

287. See Kumar, *supra* note 286, at 2528-30 (discussing how the Federal Circuit threatens separation of powers).

288. ROSA RAFFAELLI, E.U. PARLIAMENT POL'Y DEPT, DISSENTING OPINIONS IN THE SUPREME COURTS OF THE MEMBER STATES 22 (2012), <https://www.europarl.europa.eu/document/activities/cont/201304/20130423ATT64963/20130423ATT64963EN.pdf> [<https://perma.cc/L33K-ZJ6F>] (noting that in Germany, only the Federal Constitutional Court allows for dissents).

289. See Rigamonti, *supra* note 226, at 53.

290. See *id.* at 54.

IV. INTEGRATING TECHNICAL SPECIALIZATION INTO THE U.S. JUDICIAL SYSTEM

Trial court judges generally lack access to neutral technical expertise. Patent litigation is fractured among so many courts that it is impossible to ensure that all judges possess relevant technical backgrounds.²⁹¹ The Federal Circuit has furthermore discouraged judges from using court-appointed experts, out of a fear that such experts will unduly influence the proceedings.²⁹² Judges may also be reluctant to utilize them due to the cost, which gets directly passed on to the litigants.²⁹³ This leaves generalist judges in the position of having to sift through competing party-hired expert reports to understand basic scientific and technological concepts.²⁹⁴

A related problem is that under the current U.S. system, several district courts hear a high volume of patent cases and are overloaded with work.²⁹⁵ After the Supreme Court's decision regarding venue in *TC Heartland LLC v. Kraft Foods Group Brands LLC*,²⁹⁶ patent litigation soared in the District of Delaware, Central District of California, and Northern District of California.²⁹⁷ Yet, judicial appointments and new judgeships have not kept pace in these

291. See *Patent Cases Rise, with Two Courts Leading the Nation*, U.S. CTS. (Apr. 21, 2014), <https://www.uscourts.gov/news/2014/04/21/patent-cases-rise-two-courts-leading-nation> [<https://perma.cc/3WTD-RXDU>]; Fromer, *supra* note 6, at 315.

292. See *supra* notes 138-41 and accompanying text.

293. See *supra* note 155 and accompanying text.

294. See *supra* Part II.A.

295. See Sapna Kumar, *Judge-Made Solutions to Patent Litigation*, 18 CHI.-KENT J. INTELL. PROP. 508, 509 (2019) (discussing the need for additional judgeships in several patent-heavy districts and the reliance of some courts on visiting judges); *Examining the Need for New Federal Judges: Hearing Before the Subcomm. on Cts., Intell. Prop., and the Internet*, 115th Cong. 8 (2018) (statement of Hon. Lawrence F. Stengel) (discussing, on behalf of the Judicial Resources Committee of the Judicial Conference, the "urgent" need for additional judgeships in the District of Delaware and Eastern District of Texas, as well as the need for two judges in the Northern District of California).

296. 137 S. Ct. 1514, 1517 (2017) (holding "that a domestic corporation 'resides' only in its State of incorporation for purposes of the patent venue statute").

297. See Geneva Clark, *TC Heartland, Legal Trends, One Year Later*, LEX MACHINA fig.2 (May 23, 2018), <https://lexmachina.com/tc-heartland-legal-trends-one-year-later/> [<https://perma.cc/5GND-GJV3>] (discussing how one year after the Supreme Court's *TC Heartland* decision, litigation in the Eastern District of Texas dropped from 36 percent of all filings to 13 percent and cases increased in several district courts).

courts.²⁹⁸ This has led to overburdened judges turning to creative strategies to keep up with their growing patent dockets, such as staying cases while the PTAB undertakes inter partes review.²⁹⁹

Implementing a system in which TQJs and LQJs worked side-by-side as peers in U.S. courts is not feasible under the current judicial system. In the United States, almost all federal cases are heard by a single judge, not a panel.³⁰⁰ Moving to three-judge panels so that TQJs and LQJs could jointly decide cases would likely be prohibitively expensive.³⁰¹ However, expertise does not have to come directly from Article III judges.³⁰² Congress could instead provide courts with substantial patent dockets with resources to hire in-house technical expertise. This would allow judges to decide patent cases faster and could potentially increase the quality of their opinions.

Section A proposes that high-volume patent courts utilize magistrate judges who are both legally and technically qualified. Section B alternatively proposes that courts utilize technically trained staff. Finally, Section C proposes limiting all U.S. patent litigation to a group of geographically diverse urban district courts to facilitate the integration of technical expertise into the judiciary.

298. See *supra* note 295; Erin Coe, *Delaware Keeps Pace with Crush of Patent Suits, For Now*, LAW360 (Oct. 20, 2017, 5:37 PM), <https://www.law360.com/articles/976463/delaware-keeps-pace-with-crush-of-patent-suits-for-now> [<https://perma.cc/8G4P-BQJU>] (discussing the Judicial Conference's March 2017 recommendation that an additional judgeship be created for the District of Delaware to help the court with its heavy docket).

299. See William Alsup, *Huge Numbers of Patent Cases: How One District Judge Manages Them*, 18 CHI.-KENT J. INTELL. PROP. 111, 120-21 (2019) (discussing the high volume of patent cases in the Central District of California and his strategy of staying cases pending the resolution of inter partes review in the PTAB).

300. See 28 U.S.C. § 132(c) (describing how a typical district court proceeding needs to involve a single judge presiding alone). An exception exists for gerrymandering cases, which are heard by three-judge district court panels and are directly appealed to the Supreme Court. *Id.* § 2284(a).

301. Cf. Andrew MacGregor Smith, Note, *Using Impartial Experts in Valuations: A Forum-Specific Approach*, 35 WM. & MARY L. REV. 1241, 1274 n.166 (1994) (emphasizing that cost is a barrier to increasing the size of the judiciary).

302. See Rai, *supra* note 23, at 897 (noting that, although expertise in scientific fact-finding would be beneficial at the trial court level, it need not “come directly from the judges”).

A. *Technically Trained Magistrate Judges*

Magistrate judges are appointed by a majority of a district court's judges to renewable terms³⁰³ and are utilized in a variety of ways.³⁰⁴ They may be authorized to handle nondispositive pretrial matters (such as discovery motions), conduct evidentiary hearings, and provide proposed findings of fact and recommendations for the disposition of the case in judgments on the pleadings and motions for summary judgment.³⁰⁵ With consent of the litigants, magistrate judges may conduct bench and jury trials,³⁰⁶ including in patent cases.³⁰⁷ They can also be given other responsibilities that "are not inconsistent with the Constitution and laws of the United States."³⁰⁸

Various courts already utilize magistrate judges in patent cases. For example, as part of the Patent Pilot Program, the Northern District of California has "Patent Magistrate Judges," who voluntarily hear extra patent cases and preside over them with the parties' consent.³⁰⁹ In the District of Delaware, patent cases are typically referred to a magistrate judge for alternative dispute resolution.³¹⁰ Each Delaware magistrate judge is assigned to a particular district court judge and handles, among other things,

303. 28 U.S.C. § 631(e).

304. See PETER G. MCCABE, FED. BAR ASS'N, A GUIDE TO THE FEDERAL MAGISTRATE JUDGES SYSTEM 19-20 (2016), <https://www.fedbar.org/wp-content/uploads/2019/10/FBA-White-Paper-2016-pdf-2.pdf> [<https://perma.cc/GN6W-8K7H>].

305. 28 U.S.C. § 636(b)(1).

306. *Id.* § 636(c)(1); FED. R. CIV. P. 73(a) ("When authorized under 28 U.S.C. § 636(c), a magistrate judge may, if all parties consent, conduct a civil action or proceeding, including a jury or nonjury trial.").

307. See Schwartz, *supra* note 24, at 270 n.225 (finding nineteen patent cases between 1982 and 2008 decided entirely by a magistrate judge were later appealed to the Federal Circuit).

308. 28 U.S.C. § 636(b)(3).

309. General Order No. 67, U.S. Dist. Ct. N.D. Cal. (Feb. 17, 2015), <https://cand.uscourts.gov/filelibrary/839/General%20Order%2067.pdf> [<https://perma.cc/8T59-SHJ9>]. Eight magistrate judges serve in this role. *Patent Pilot Program*, U.S. DIST. CT. N. DIST. OF CAL., <https://cand.uscourts.gov/about/court-programs/patent-pilot-program/> [<https://perma.cc/K54F-BG2F>]. The Eastern District of New York also has nine magistrate judges participating in the pilot program. Press Release, U.S. Dist. Ct. E. Dist. of New York, EDNY Implements Patent Pilot Program (Feb. 7, 2012), [https://img.nyed.uscourts.gov/files/local_rules/PatentPilotProject-NYED PressRelease.pdf](https://img.nyed.uscourts.gov/files/local_rules/PatentPilotProject-NYED%20PressRelease.pdf) [<https://perma.cc/E92Z-L6F2>].

310. See Jeff Castellano, *The Latest Pretrial Procedures in the District of Delaware*, LAW360 (Mar. 25, 2019, 2:01 PM), <https://www.law360.com/articles/1142297/the-latest-pretrial-procedures-in-the-district-of-delaware> [<https://perma.cc/F9BA-5H4K>].

early motions and discovery.³¹¹ The court also has one magistrate judge who has a Ph.D. in molecular biophysics and has patent litigation experience.³¹² The Eastern District of Texas also utilizes magistrate judges to assist with patent cases.³¹³

Congress could provide funds to district courts with significant patent dockets to employ full-time or part-time technically trained magistrate judges.³¹⁴ Former patent attorneys and administrative patent judges with technical backgrounds could be hired to handle *Markman* hearings and pretrial proceedings in patent cases. They could also serve as technical advisors to the district judges, explaining difficult technological concepts and providing unbiased tutorials. Because they would also be legally qualified, they could work on nonpatent cases as necessary to comprise an adequate caseload.

The ideal way to implement this proposal would be for district courts to hire people with varied technical backgrounds. Courts could potentially share magistrate judges, either for the entire district court system or regionally. For example, the District of Delaware and District of New Jersey both hear a high volume of patent cases and are geographically close enough to support a shared pool of expert magistrate judges.³¹⁵ Likewise, the four federal courts in California could share, given the frequent short flights connecting the state.³¹⁶

To ensure that this proposal would improve patent litigation, Congress could initiate a trial. It could select a few courts with a high volume of patent cases to participate and choose one technical area to focus on, such as biology. Participating courts would then be provided with funds to hire one or more magistrate judges from the

311. *Id.*

312. Young Conaway Staff, *Jennifer L. Hall Selected as U.S. Magistrate Judge for the District of Delaware*, DEL. IP L. BLOG (Feb. 28, 2019), <https://delawareiplawblog.wordpress.com/2019/02/28/jennifer-l-hall-selected-as-u-s-magistrate-judge-for-the-district-of-delaware/> [<https://perma.cc/LSH7-YCYJ>].

313. *Patent Cases Rise, with Two Courts Leading the Nation*, *supra* note 291.

314. *See* Di Lello, *supra* note 24, at 499-500 (proposing the creation of permanent expert magistrate judges).

315. *See* Clark, *supra* note 297 (including the District of New Jersey as a court with a high volume of patent cases); *About U.S. Federal Courts*, FED. BAR ASS'N, <https://www.fedbar.org/for-the-public/about-u-s-federal-courts/> [<https://perma.cc/RT4D-EZAW>] (showing the proximity of the New Jersey and Delaware districts).

316. *See* *About U.S. Federal Courts*, *supra* note 315 (showing the layout of California districts).

relevant technical area with a standard eight-year contract.³¹⁷ If the trial is successful, it could be expanded to other high-volume patent courts or to other technical areas.

As discussed above, a concern exists that generalist judges might unduly rely upon neutral experts with little vetting. However, judges on courts with heavy patent dockets are likely to be familiar with patent law, making the risk of overreliance smaller. Just as Federal Circuit judges are capable of reviewing technical information from law clerks, district judges who frequently hear patent cases should be able to review decisions from technically qualified magistrate judges. If need be, courts could also adjust local rules to ensure that there is sufficient oversight.³¹⁸ Furthermore, courts would presumably exercise greater due diligence when hiring magistrate judges with eight-year contracts compared to experts assisting the court for a single case.

One potential concern would be that the use of magistrate judges could partially undermine the adversarial system, by displacing party-hired experts. But parties could still use their own experts to present competing versions of scientific evidence. Unlike with the current system, however, there would be a decision maker capable of sifting through the evidence and determining what is credible.³¹⁹ Demeanor, credentials, and guesswork would no longer play an outsized role in claim construction.

Another potential issue is finding qualified individuals in certain areas of technology, such as electrical engineering and computer science. A nationwide search would likely be required and the salary would need to be high enough to compete with other employment opportunities. However, even if a court is able to use technically trained magistrate judges in only a few areas of technology, this would represent an improvement over the status quo. Indeed, not all high-volume courts will need experts in all areas of technology,

317. *About Federal Judges*, U.S. CTS., <https://www.uscourts.gov/judges-judgeships/about-federal-judges> [<https://perma.cc/W84L-HRRF>].

318. Note that a current problem is that the standard of review for magistrate judges varies by district court. See Steven Callahan, *Are Magistrate Judges' Orders on Claim Construction Reviewed De Novo by the District Court Judge?*, N. DIST. OF TEX. BLOG (June 13, 2014), <https://www.ndtexblog.com/2014/06/13/are-magistrate-judges-orders-on-claim-construction-reviewed-de-novo-by-the-district-court-judge/> [<https://perma.cc/PK66-XYKZ>].

319. See *supra* notes 109-10 and accompanying text.

given some specialties cluster in particular geographic regions.³²⁰ If district courts were able to share judges regionally, that would also reduce the number of people that the court needs to hire.

Using magistrate judges to augment judicial expertise does have some disadvantages compared to the European systems discussed above. Particularly in Germany and the proposed UPC, the TQJs are true peers of the LQJs, allowing them to attract top talent.³²¹ The TQJs need not be legally trained, making the pool of potential candidates greater.³²² Furthermore, in Germany, the same panel works together on many cases, allowing trust to develop among the judges.³²³

However, using magistrate judges represents the best possible compromise between the U.S. and European systems, allowing an expert judge to help decide patent cases without having to move to a three-judge panel system. It takes advantage of the fact that some U.S. lawyers complete science or technology-related undergraduate degrees prior to law school. Moreover, utilizing long-term contracts would allow district judges to develop trust in individual magistrate judges over time.

If the trial is successful and courts decide to use specialized magistrate judges more broadly, courts could cover their costs by raising filing fees for patent cases, perhaps through a surcharge for technically complex cases. If the system were implemented nationwide, the government could fund the system through patent filing fees.³²⁴

320. See Shawn P. Miller, *Venue One Year After TC Heartland: An Early Empirical Assessment of the Major Changes in Patent Filing*, 52 AKRON L. REV. 763, 804, 807 (2018) (discussing how pharmaceutical patent cases tend to be clustered in the Districts of Delaware and New Jersey); Fromer, *supra* note 30, at 1447 (predicting that if venue were restricted to the defendant's principal place of business, cases involving particular technologies would naturally cluster in certain geographic areas, such as software cases in Silicon Valley, Boston, and Seattle).

321. See Seuba, *supra* note 96, at 274.

322. See *id.* at 280.

323. *German FPC Brochure*, *supra* note 210, at 7-8.

324. This is the approach taken by Switzerland. See Swiss Patent Court Act, *supra* note 232, art. 4 (“The Federal Patent Court is financed by court fees and contributions from the Swiss Federal Institute of Intellectual Property (IPI) taken from the patent fees annually collected by the IPI.”); Reglement über die Prozesskosten beim Bundespatentgericht [Regulations on Litigation Costs at the Federal Patent Court] Sept. 28, 2011, arts. 1, 3 (Switz.), https://www.bundespatentgericht.ch/fileadmin/web-dateien/014.223_Reglement_ueber_die_Prozesskosten_beim_Bundespatentgericht_EN_per_121212.pdf [<https://perma.cc/KWH6-VLNK>] (regulating court fees as well as the compensation for costs of legal representation).

B. Technically Trained Staff

Congress could alternatively select a few district courts to participate in a trial utilizing technically trained staff, selecting a technical area and providing the courts with a budget to hire one or more staff members for a set term. These employees would ideally have some patent background, such as past work experience as a patent examiner or agent. Existing Patent and Trademark Office (PTO) examiners could alternatively be granted a three-year leave of absence to work for a court. Staff could easily assist multiple courts via video conferencing.

The staff would serve in an advisory role for cases in their respective areas of expertise. They could observe *Markman* hearings and issue nonbinding reports afterwards. They could serve a similar role to that of a technical advisor, explaining unfamiliar technology to the judge. This system could be used alone or alongside technically trained magistrate judges.

Similar systems already exist elsewhere in the world. For example, in Japan's Intellectual Property High Court, cases heard before a panel of judges are assigned a full-time judicial research official, who possesses a relevant technical background and has patent experience from working as a patent litigator or an examiner in the Japan Patent Office.³²⁵ The court also employs part-time technical advisors, generally professors or researchers, who serve two-year terms.³²⁶ Several other IP courts—including those of China, Russia, and South Korea—also rely on internal technical advisors.³²⁷

Having a fixed pool of experts would have several advantages over the status quo. It would flip the default, allowing district judges to freely use experts without having to justify their hiring based on exceptional circumstances.³²⁸ It would provide judges with vetted experts who do not possess any conflicts of interest and

325. See Yasufumi Shiroyama, *Japan*, PAT. LITIG. L. REV. (Nov. 2019), <https://perma.cc/VS76-8BVY>; *Technical Advisors in Intellectual Property Lawsuits*, INTELL. PROP. HIGH CT., <http://www.ip.courts.go.jp/eng/documents/expert/index.html> [<https://perma.cc/S9Z3-APNM>]; Seuba, *supra* note 96, at 271.

326. See *Technical Advisors in Intellectual Property Lawsuits*, *supra* note 325.

327. See Seuba, *supra* note 96, at 270.

328. See *supra* notes 133-35 and accompanying text.

whose costs are not directly shifted to the parties.³²⁹ The presence of experts may furthermore lead to faster trial court proceedings and more accurate claim construction.³³⁰ As with the proposal for magistrate judges, Congress could authorize a trial to verify that the use of staff leads to improvements before committing to any long-term change.

The use of staff has some drawbacks compared to using magistrate judges. Staff are unlikely to be as carefully vetted as magistrate judges, given the lesser job functions that they would perform. The interactions between staff and judges would lack transparency, not unlike the current use of technical advisors and law clerks.³³¹ It is also unclear how much staff experts would be able to alleviate the high workloads that plague many popular patent venues, given that their duties would be highly circumscribed. Moreover, to the extent that staff is taken “on loan” from the PTO, there is an additional risk of industry capture.³³² But notwithstanding these disadvantages, technical staff would likely be a major improvement over the current system.

C. Restructuring the District Court System for Patent Litigation

One major problem with increasing the technical expertise of the U.S. judiciary is the fact that ninety-four different district courts hear patent cases.³³³ It would be impossible for every court to have expertise in every scientific or technical discipline. Moreover, judges who infrequently hear patent cases might be more inclined to improperly rely upon expert opinions—whether from magistrate judges or in-house technical advisors. One solution that several commentators have proposed is to create a single Article III patent

329. See *supra* notes 155-56 and accompanying text.

330. Note that affirmance rate is not necessarily the best measure of success, given that it assumes Federal Circuit judges correctly decide claim construction notwithstanding the fact that they frequently lack technical backgrounds in the area of the cases before them.

331. See *supra* notes 119-21, 145 and accompanying text.

332. As discussed above, prior work experience can impact how someone views a case. Ramji-Nogales et al., *supra* note 53, at 345-46. There is a possibility that hiring staff from the PTO who intend to return to the PTO could lead to skewed decision-making.

333. See *Court Role and Structure*, U.S. CTS., <https://www.uscourts.gov/about-federal-courts/court-role-and-structure> [<https://perma.cc/5EL5-WSLM>] (providing the total number of U.S. district courts).

trial court,³³⁴ which could then be provided with technically trained magistrate judges or staff. However, a single patent court would be vulnerable to tunnel vision, bias, and capture by various interest groups,³³⁵ and the already politicized U.S. judicial appointments process could become skewed towards overtly pro-patent judges.

Instead of creating a new court, Congress should confer jurisdiction over all U.S. patent cases to a group of existing urban district courts.³³⁶ Factors in selecting which courts could hear patent cases would include the size of the court's current patent docket, litigant access to a major airport, and geographic diversity. For example, patent cases that used to be filed in the Eastern District of Texas would instead be litigated in the Northern District of Texas, which has patent expertise and is located near a major airport. Patent cases that were filed in district courts in the Eighth Circuit and Tenth Circuit could go to the District of Utah; Fourth and Sixth Circuit district patent cases could go to the Eastern District of Virginia. With patent litigation formally concentrated at the trial-court level, technically trained magistrate judges or staff could be hired to assist the courts with their increased workloads.

Concentrating patent cases into a group of courts would likely lead to greater efficiency.³³⁷ As Judge Holderman noted, although district judges keep abreast of the latest case law from their regional court of appeals, they do not typically follow current Federal Circuit cases.³³⁸ Consequently, he observed that "only when

334. See Connors, *supra* note 23, at 802 (proposing a single patent trial court); Rai, *supra* note 23, at 880 (maintaining that despite the risk of capture and tunnel vision, a single patent trial court would be superior to the current system of semi-specialized trial courts); Moore, *supra* note 23, at 932 (maintaining that providing a patent trial court with exclusive jurisdiction would increase the predictability of patent law, alleviate strain on district courts, and allow the judges to develop expertise).

335. See Rai, *supra* note 23, at 896-97 (acknowledging the various risks of creating a specialized patent trial court, but maintaining the advantages outweigh the disadvantages).

336. A tentative list of courts could be: District of Delaware, Central District of California, Northern District of California, District of New Jersey, Northern District of Illinois, Southern District of New York, Northern District of Texas, Southern District of Florida, District of Massachusetts, District of Utah, Eastern District of Virginia. Given the high volume of patent litigation in the Ninth Circuit, it might make sense for a third court to be located there, perhaps in the Southern District of California.

337. This conclusion is supported by early evidence from the Patent Pilot Program, which shows that pilot judges decide patent cases faster than other judges. WILLIAMS ET AL., *supra* note 39, at v.

338. Holderman, *supra* note 2, at 429.

a patent case comes our way do we brush up on the latest developments in the law.”³³⁹ By reducing the number of judges who can hear patent cases and boosting the patent caseload for the judges that can hear them, there will undoubtedly be a savings in time. The judges who used to only sporadically hear patent cases will no longer have to invest time reading the latest Federal Circuit decisions.

There are risks to creating semi-specialized trial courts. For example, the Federal Circuit’s high degree of specialization has led to numerous dysfunctions, including disregarding agency autonomy and undermining separation of powers through judicial legislating.³⁴⁰ Locking in the location of where patent litigation must take place could result in the next Silicon Valley not having a nearby district court that can hear patent cases. Also, at least one empirical study suggests that district judges who hear more patent cases are more likely to rule in favor of the infringer.³⁴¹

However, de facto specialization already exists at the district court level. Even after the Supreme Court’s decision in *TC Heartland*, ten courts hear nearly 75 percent of all patent cases.³⁴² Under the current system, there are no limits to the percentage of time a judge can spend on patent cases, leading to some judges becoming overly specialized.³⁴³ Moreover, in choosing the courts that hear patent litigation, geography and accessibility would be taken into

339. *Id.*

340. Kumar, *supra* note 286, at 2520-23, 2526-28.

341. See Lemley et al., *supra* note 81, at 1138 (analyzing a data set of final district court patent decisions and finding “that judges with more experience deciding patent cases are less likely to find for the patentee”).

342. DOCKET NAVIGATOR, 2019 YEAR IN REVIEW 15, <https://brochure.docketnavigator.com/2019-year-in-review/> [<https://perma.cc/4344-GEN7>]; see also Clark, *supra* note 297, fig.2 (showing the general patent litigation case filings from May 23, 2017 to May 17, 2018).

343. In 2015, 28 percent of all newly filed U.S. patent cases were before Judge Gilstrap. Kaleigh Rogers, *The Small Town Judge Who Sees a Quarter of the Nation’s Patent Cases*, VICE (May 5, 2016, 9:00 AM), https://www.vice.com/en_us/article/aek3pp/the-small-town-judge-who-sees-a-quarter-of-the-nations-patent-cases [<https://perma.cc/NL43-DCNG>]. This amount was almost double the number of the judge holding the number two position: Judge Schroeder of the Eastern District of Texas. Matt Chiappardi & Daniel Siegal, *Gilstrap Moves Over for America’s Next Top Patent Judge*, LAW360 (June 1, 2017, 7:39 PM), <https://www.law360.com/articles/930023/gilstrap-moves-over-for-america-s-next-top-patent-judge> [<https://perma.cc/GN43-8825>].

account to ensure that defendants are not forced to litigate in highly inconvenient forums.

To help prevent tunnel vision, the patent dockets for individual judges could be capped. Congress could require that individual judges on the selected district courts hear no more than 25 percent patent cases, to ensure that they maintain breadth and do not become too specialized. Maintaining such a threshold should ensure that judges are well versed in other areas of law when they are appointed. If a court's docket becomes too patent heavy, judges with patent experience from other courts could sit by designation. The risk of tunnel vision could be further mitigated by choosing courts that already have significant nonpatent dockets.

This proposed system could be structured to mitigate some of the pro-patent bias that has emerged from certain district courts. For example, Megan La Belle has highlighted how local rules may make a district court more plaintiff-friendly for patent litigation.³⁴⁴ Congress could pass a Federal Rules of Patent Procedure, as La Belle advocates,³⁴⁵ and use them to formalize the role of magistrate judges in patent cases and create a uniform standard of review for magistrate judges' claim construction. Patent-specific procedural rules could also limit district courts' ability to manufacture patent dockets for internet-related cases through plaintiff-friendly practices, as the Eastern District of Texas currently does.³⁴⁶

If providing a group of existing courts with exclusive patent jurisdiction is not feasible, an alternative would be to designate

344. La Belle, *supra* note 33, at 99-100 (“[P]laintiffs may favor the Eastern District of Texas because its rules require early disclosure of infringement and invalidity contentions together with documents supporting those contentions.”).

345. *See id.* at 110-12 (proposing that Congress pass Federal Rules of Patent Procedure to unify patent law).

346. Post-*TC Heartland*, the Eastern District of Texas has continued to employ creative maneuvers to retain jurisdiction over patent cases. For example, it found venue over patent infringement suits against Apple, based on Apple stores located in Frisco and Plano, leading to Apple closing those stores. David Yates, *Apple Bolting from Eastern District of Texas, Venue a Favorite of Patent Trolls*, SE. TEX. REC. (Mar. 5, 2019), <https://setexasrecord.com/stories/512106032-apple-bolting-from-eastern-district-of-texas-venue-a-favorite-of-patent-trolls> [<https://perma.cc/2FEJ-FWZ9>]. It also allowed litigation to proceed against Google based on the location of servers in East Texas. Malathi Nayak, *Google Denied Rehearing in Bid to Transfer Patent Lawsuit (2)*, BLOOMBERG L. (Feb. 5, 2019, 4:14 PM), <https://news.bloomberglaw.com/ip-law/google-denied-rehearing-in-bid-to-transfer-patent-lawsuit-2> [<https://perma.cc/N8L8-XW7H>].

certain courts as being “preferred patent courts” and allow other courts to transfer patent cases to the closest designated one. Judge Saris has argued that judges who enjoy patent cases should be given cases from other districts, perhaps by altering venue rules.³⁴⁷ Her district, the District of Massachusetts, has accepted transfers of patent cases from overburdened courts—a system that Judge O’Malley thought could be further expanded.³⁴⁸ Allowing courts that rarely hear patent cases to transfer them to courts with legal and technical expertise could lead to faster proceedings and higher-quality decisions.

CONCLUSION

U.S. district courts are ill-suited to the task of judging patent cases. Although some judges have legal expertise in patent law, no one person possesses a sufficient level of knowledge of all the different scientific fields to be able to understand the full spectrum of patent claims that are litigated. Although neutral expertise is theoretically available to judges, in practice, various obstacles prevent these experts from being widely used. This forces generalist judges to sift through technical and scientific information provided by party-hired experts, likely increasing the amount of time it takes to litigate a patent case and decreasing the accuracy of the decisions.

The German and Swiss systems, as well as the proposed UPC, illustrate that there are benefits to integrating technical expertise into the judiciary for patent cases. The German and Swiss FPC’s use of TQJs has facilitated their ability to quickly and accurately decide patent cases. In-house technical expertise flips the default, ensuring that judges always have ready access to trusted knowledge, rather than forcing judges to justify the need for extra help.

Congress should implement a trial to provide funding for district courts with substantial patent dockets to hire technically trained magistrate judges. Magistrate judges could provide support in cases that are within their areas of expertise, helping to reduce the burden on strained district courts. They could also serve as technical

347. O’Malley et al., *supra* note 1, at 683-84.

348. *Id.* at 690.

advisors to district judges by explaining unfamiliar technology. If this is not feasible, then Congress should fund a trial providing a few courts with technical staff.

Furthermore, given that just ten district courts hear three-fourths of all U.S. patent cases,³⁴⁹ Congress should consider limiting patent litigation to a group of urban district courts that are geographically diverse. Patent caseloads could be limited for each judge, to prevent tunnel vision and reduce the risk of capture. Rules of patent procedure could be introduced to ensure that courts are fair to both plaintiffs and defendants, as well as to avoid the pro-patent bias that is currently seen in some district courts, such as the Eastern District of Texas.³⁵⁰ Such a change would ensure that all patent cases are heard by judges who have legal expertise in patent law and would facilitate the introduction of either technically trained magistrate judges or staff.

349. PATENT CASES FILED BY YEAR, *supra* note 8.

350. *See supra* notes 49-52 and accompanying text.