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# Fifty Years of Patent Law: The Top Ten Developments

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My professional engagement in patent law spans 50 years. In the early 1970's, I began the research that led to the 1978 publication of a five-volume treatise. After its publication, the treatise required regular updating to reflect patent law developments. Little did I know that I would still be at it after these many years (and 185 "releases").

Many basic features of the U.S. patent system remained fundamentally the same during the past 50 years. But there have been significant developments. Below I review the top ten in reverse order of significance[1] and add a bonus development.

**10. Hatch-Waxman Act.** In 1984, Congress passed the "Hatch-Waxman Act."[2] It could well have been titled "The Patent Lawyers and Litigators Full Employment Act." And it should have been given a Pulitzer prize for linguistic complexity.

The Act negotiated a compromise between the generic drug industry (which wanted a procedure to obtain quicker and easier Food and Drug Administration approval of generic drugs) and the brand drug industry (which wanted extension of patent term for regulatory delays in approval of new drugs).

Some would contend that the Act fostered disrespect for the patent system on both sides. In Section 271(e)(2), it authorized a patent owner to sue a generic that filed an "ANDA" to obtain FDA approval immediately, i.e., before FDA approval to market the drug.[3] That gave generics an incentive to challenge even strong patents on drugs because they could contest a

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[1]For prior top tens, see Chisum, "Top Ten Intellectual Property Cases of the Federal Circuit 1982-2002," Twentieth Anniversary Judicial Conference of the Court of Appeals for the Federal Circuit, Washington, D.C., April 8, 2002, published at 217 F.R.D. 548; Chisum, The Year in Review: The Patent and Trademark Decisions of the Court of Appeals for the Federal Circuit," The Second Annual Judicial Conference of the Court of Appeals for the Federal Circuit, Washington, D.C., April 26, 1984, published at 104 F.R.D. 207.

[2]Drug Price Competition and Patent Term Restoration Act of 1984, P.L. 98-417, Title II, 98 Stat. 1585 (Sept. 24, 1984).

On Hatch-Waxman, see Chisum on Patents § 16.03[1][d] (2022).

[3]For a Supreme Court discussion of Section 271(e)(2), see Eli Lilly & Co. v. Medtronic, Inc., 496 U.S. 661, 676-78 (1990).

patent's scope and validity without risking a potentially enormous damage award.[4] The Act also gave patent owners an incentive to obtain weak, incremental patents on drugs that were vulnerable to a validity challenge. By suing for infringement thereof, patent owners obtained an automatic 30-month stay of FDA approval of a generic drug.

Could we have both a healthy, patent-supported research drug industry and a cost-saving generic industry without the litigation-inducing Hatch-Waxman Act ANDA suit provision? Likely yes. With conventional patent enforcement, a generic, reasonably confident in its position, could develop, obtain FDA approval, and "test" a product in the market. A patent owner, confident in its position, could sue and make an appropriate showing for a preliminary injunction. One might examine how all this works in countries without the ANDA suit procedure.

**9. Patent Litigation's "Excess Luggage" (Best Mode, Inequitable Conduct, Willful infringement and Attorney Fee Awards).** Patent litigation should focus primarily on two basic issues: infringement (claim scope) and validity (patentability). During the 50 year period, four additional issues distracted from the basics. The issues were excess luggage from the start and later became too uncertain. Cases on the issues added many pages to *Chisum on Patents*. In time, each was either trimmed or simplified by the Supreme Court, the Federal Circuit, or Congress.

First was the statutory "best mode" requirement.[5] A patent otherwise valid and infringed could be invalidated because it failed to disclose an inventor's subjective preference on some aspect of a claimed invention. Cases parsed the details of the requirement, such whose "contemplation" mattered[6]and on what date.[7] A favorite defense tactic was to depose an inventor early. Tell me about your invention? The inventor might boast of various advantageous features. Then ask: where is that in the patent? I can't find it. Voila! Summary judgment of invalidity!

In the 2011 American Invents Act, Congress stepped in. The best mode disclosure requirement remained but not as a requirement for priority to a prior application, an invalidity defense in an infringement suit, or a basis for post grant review.[8] That solution was odd. Can you omit a best mode or not? But the amendment quashed best mode as a litigation complicator. The Federal Circuit issued no precedential decisions on best mode from 2011 through 2022.

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[4]See GlaxoSmithKline LLC v. Teva Pharmaceuticals USA, Inc., 7 F.4th 1320 (Fed. Cir. 2021).

In *Glaxo*, which was a "regular" infringement suit, not an Hatch-Waxman Act ANDA suit, a divided Federal Circuit panel affirmed infringement of a treatment method patent. A jury awarded the patent owner $234,110,000 in damages for lost profits (even though the generic's sales amounted to only $74,500,000 and there were other generic equivalents available).

[5]On best mode, see Chisum on Patents § 7.05 (2022).

[6]See, e.g., Glaxo Inc. v. Novopharm Ltd., 52 F.3d 1043 (Fed. Cir. 1995).

[7]See, e.g., Transco Products Inc. v. Performance Contracting, Inc. 38 F.3d 551 (Fed. Cir. 1994).

[8]Leahy-Smith America Invents Act, Pub. L. No. 112-29, § 15(a) 125 Stat. 284, 328 (2011) (amending 35 U.S.C. § 282(b)(3)(A) to state "the failure to disclose the best mode shall not be a basis on which any claim of a patent may be canceled or held invalid or otherwise unenforceable").

Second was inequitable conduct.[9] Inventors and their representatives owe a duty of candor in prosecuting a patent application in the Patent and Trademark Office (PTO). That includes disclosing known material prior art. But, like best mode, inequitable conduct became a routine, overly-pleaded defense against a patent otherwise apparently valid and infringed. One distractive aspect was that the defense focused attention on attorney conduct during prosecution. The Federal Circuit stepped in with an en banc ruling, *Therasense* (2011),[10] which raised the bar on the showings of materiality (it must be "but for") and deceptive intent. Thereafter, the defense continued but usually only on a well-supported, factual basis.[11] The Supreme Court has yet to weigh in on the Federal Circuit's standard for the inequitable conduct defense.

Third was willful infringement.[12] The Patent Act authorized a district court to increase damages up to three times actual damages.[13] It set no standard but had been construed as proper for willful infringement. Like inequitable conduct, willful infringement came to be charged routinely, in this instance, by the patent owner against an accused infringer. Again, attention focused frequently on attorney conduct: was an attorney's noninfringement or invalidity opinion competent? The Federal Circuit responded with two en banc decisions. *Knorr* barred adverse inferences from an infringer's failure to offer an exculpatory opinion of counsel.[14] *Seagate* abolished the "affirmative duty of care," clarified that a waiver of the attorney-client privilege arising from reliance on an advice-of-counsel defense to a charge of willful infringement did not extend to communications with, and work product of, trial counsel, and established a "two-prong" test for willful infringement.[15] First was an objective prong (acting despite "objectively high likelihood" that the acts infringed valid patent). Second was a subjective prong (known or should have known). Both were provable by clear and convincing evidence. In *Halo* (2016),[16] a unanimous Supreme Court rejected the two-prong test and the high proof standard and simplified the willfulness inquiry. The Court reminded us that its early decisions construed the statutory authority to increase damages as allowing a discretionary increase as punishment for willful infringement. Willful infringement was just that: deliberate acts in disregard of known patent rights. The Federal Circuit's *Seagate* threshold allowed a willful infringer to escape enhanced damages by mustering "a reasonable (even though unsuccessful) defense at the infringement trial" even when the infringer did not act based on the defense. Despite rejecting *Seagate*'s

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[9]On inequitable conduct, see Chisum on Patents § 11.03b[4], § 1903 (2022).

[10]Therasense, Inc. v. Becton, Dickinson & Co., 649 F.3d 1276 (Fed. Cir. 2011) (en banc).

For a discussion of *Therasense*, see Chisum on Patents § 19.03[3][e][v], § 19.03[4][g][iii] (2022).

[11]E.g., Belcher Pharmaceuticals, LLC v. Hospira, Inc., 11 F.4th 1345 (Fed. Cir. 2021) ("Chief Science Officer" (not patent agent or attorney or inventor) withheld material information; prior product known to have pH (2.9, 2.9, 3.1) within claimed range (2.8 to 3.3); inconsistent arguments to FDA for drug approval and to PTO examiner).

[12]On willful infringement, see Chisum on Patents § 20.03b[4][b][v][K] (2022).

[13]35 U.S.C. § 284.

[14]Knorr-Bremse Systeme Fuer Nutzfahrzeuge GMBH v. Dana Corp., 383 F.3d 1337(Fed. Cir. 2004).

[15]*In re* Seagate Technology LLC, 497 F.3d 1360 (Fed. Cir. 2007) (en banc).

[16]Halo Elecs., Inc. v. Pulse Elecs., Inc., 579 U.S. 93 (2016).

For a discussion of Halo, see § 20.03b[4][b][x].

threshold, the Court did not purport to restore the Federal Circuit's pre-*Seagate* "affirmative duty of care" standard, which was effectively one of negligence, not willfulness, and which allowed patent owners to routinely assert willful infringement.

Fourth was attorney fee awards.[17] The Patent Act authorized a district court to award fees in "exceptional cases" to a prevailing party.[18] Especially in response to suits by non-practicing patent owners, exonerated accused infringers routinely sought fees. Similarly to its cases on willfulness, the Federal Circuit adopted a per se test with a threshold.[19] The cases required either litigation misconduct or a showing of both subjective bad faith and objective baselessness to find a case "exceptional." This test tended to shield non-prevailing patent owners just as *Seagate* shielded non-prevailing accused infringers. And, again, in *Octane Fitness* (2014)[20] and *Highmark* (2014),[21] the Supreme Court rejected the Federal Circuit's approach as too rigid. An "exceptional case" was "simply one that stands out from others with respect to the substantive strength of a party's litigating position (considering both the governing law and the facts of the case) or the unreasonable manner in which the case was litigated."[22] The Court emphasized that an attorney fee award lay heavily within the discretion of a district court.

**8. Remedies: Injunctions and Damages**. The primary remedies for patent infringement are an injunction and damages. Two Supreme Court cases were milestones.

On injunctions, the Court, in *eBay* (2006),[23] emphasized that there was no "general rule," unique to patent cases, that a permanent injunction must issue, absent extraordinary circumstances, once a patent is adjudged infringed and not invalid. Rather, in determining whether to grant a permanent injunction, a court should apply traditional equitable principles. These included whether the patent owner would suffer irreparable injury, whether "remedies available at law, such as monetary damages, are inadequate to compensate for that injury," "the balance of hardships" and whether "the public interest would not be disserved by a permanent injunction." In *eBay*, after a jury found a patent valid and infringed, a district denied a permanent injunction, relying, inter alia, on the fact the patent owner did not practice the patent. A Federal Circuit panel reversed, applying a "general rule" that a court should issue a permanent injunction against patent infringement absent exceptional circumstances. The Court held that both courts erred.

On damages, the Court, in *SCA Hygiene* (2017),[24] overruling the Federal Circuit's 1992 en banc decision in *A.C. Aukerman*,[25] held that the traditional equitable defense of "laches", which barred pre-suit damages if a claimant unreasonably delayed suing to the prejudice of a

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[17]On attorney fee awards, see Chisum on Patents § 20.03b[4][c] (2022).

[18]35 U.S.C. § 285.

[19]E.g., Brooks Furniture Mfg., Inc. v. Dutailier Int'l, Inc., 393 F.3d 1378 (Fed. Cir. 2005).

[20]Octane Fitness, LLC v. ICON Health & Fitness, Inc., 572 U.S. 545 (2014).

[21]Highmark Inc. v. Allcare Health Management Sys., Inc., 572 U.S. 559 (2014).

[22]572 U.S. at 554.

[23]eBay Inc. v. MercExchange, LLC, 547 U.S. 388 (2006).

[24]SCA Hygiene Products Aktiebolag v. First Quality Baby Products, LLC., 137 S. Ct. 954 (2017).

[25]A. C. Aukerman Co. v. R. L. Chaides Construction Co., 960 F.2d 1020, 22 USPQ2d 1321 (Fed. Cir. 1992) (en banc).

defendant, could not preclude a patent owner's claims for damages for infringements occurring in the six-year pre-suit period prescribed by Section 286. The Court left in place the separate defense of equitable estoppel, which could bar all relief against an infringer based on a patent owner's misleading representation that it would not sue. The policy implications of *SCA Hygiene* are dubious. For example, a company having good faith questions about a patent's scope might communicate them to the patent owner. The patent owner could choose not to respond (and thus avoid any prospect of a declaratory judgment suit) and wait six years to sue while the company built a business around a technology later found infringing.

**7. Venue**. The Judicial Code restricts venue in a patent infringement suit to either the state of an accused infringer's residence or a district in which it had both a regular and established place of business *and* committed an act of infringement.[26] That contrasted with the general venue statute that permitted, via a definition of "residence," a suit against a corporation in any district in which it was subject to personal jurisdiction. Typically, a corporation distributing a product nationally would be subject to jurisdiction in most if not all districts in an infringement suit
concerning the product.

In *VE Holding* (1990),[27] a Federal Circuit changed the then-accepted understanding that the special venue statute precluded a patent owner from suing in its home base or in another preferred district. The decision facilitated a trend for patent owners, especially non-practicing entities, to file suits in districts, such as the Eastern District of Texas, in which the court offered a quick path to trial.

In *TC Heartland* (2017),[28] the Supreme Court blew the whistle, holding that the expansive definition of a domestic corporation's "residence" in the general venue statute did *not* apply to the exclusive venue provision for patent infringement suits.

Thus began a process wherein the Federal Circuit faced new and difficult issues on what constituted a place[29] and where an infringing act occurred.[30] Those issues had been irrelevant during the *VE Holding* period (1990 to 2017). In some ways, this starting-from-scratch process resembled what the Federal Circuit did for many patent law issues in the early years after its creation in 1982.

**6. Standard of Review**. In systems for resolving disputes over the facts, the law or both, it is common to provide a review structure, i.e., appeals. The "standard of review" on appeal can be critical. Is it "de novo", i.e., the review starts from scratch, or subject to some form of deference to an initial decider? In the 50 year span, the Supreme Court addressed review of

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[26]28 U.S.C. § 1404(a).

On venue in patent suits, see Chisum on Patents § 21.02[2] (2022).

[27]VE Holding Corp. v. Johnson Gas Appliance, 917 F.2d 1574, 16 USPQ2d 1614 (Fed. Cir. 1990).

[28]TC Heartland LLC v. Kraft Foods Group Brands LLC, 137 S. Ct. 1514 (2017).

[29]E.g., Andra Group, LP v. Victoria's Secret Stores, LLC, 6 F.3d 1283 (Fed. Cir. 2021); In re Google LLC, 949 F.3d 1338 (Fed. Cir. 2020); *In re* Cray, 871 F.3d 1355 (Fed. Cir. 2017).

[30]Celgene Corp. v. Mylan Pharmaceuticals Inc., 17 F.4th 1111 (Fed. Cir. 2021); Valeant Pharms. N. Am. LLC v. Mylan Pharms., Inc., 978 F.3d 1374 (Fed. Cir. 2020).

patent decisions in three areas.

The first area concerned court review of decisions by the Patent and Trademark Office and in particular, the PTO's findings of fact in the course of examining patent applications. From its beginning in 1983, the Federal Circuit applied the same "clear error" standard used for reviewing district court findings.[31] The PTO campaigned for a more deferential "substantial evidence" standard as provided in the Administrative Procedure Act (APA). In *Lueders* (1997),[32] Judge Giles Rich provided an extensive historical analysis defending the clear error standard. In *Zurko* (1998),[33] the Federal Circuit sitting en banc rejected the PTO's arguments. The Supreme Court reversed.[34]

The APA substantial evidence review standard acquired even greater significance when, in the 2011 America Invents Act, Congress expanded post-issuance review by the PTO, including inter partes review. The AIA contained a provision that ostensibly precluded judicial review of a decision by the PTO's director to institute an inter partes review. Three Supreme Court decisions grappled with that provision.[35]

The second area concerned the allocation of decisional authority between the judge and a jury in a patent infringement suit. The Seventh Amendment to the U.S. Constitution guarantees a right to trial by jury in civil cases. That has long been understood to include patent infringement suits seeking damages. In *Markman* (1996),[36] the Supreme Court held that the interpretation of a patent claim was "a matter of law reserved entirely for the court." For historic reasons, there was no right to have a jury resolve a dispute about the meaning of a claim, even when the patent owner offered expert testimony on the meaning of a "term of art." The decision induced creation a new pre-trial procedure in infringement suits, the "*Markman* hearing" on claim construction.[37]

The third area concerned the standard of appellate review of claim construction, whether by a district court, the PTO, or the International Trade Commission. The Supreme Court's *Markman* did not resolve that question; it only held that construction was not for a jury, and did not necessarily exclude appellate deference to a trial court's resolution of factual issues pertinent to construction. The Federal Circuit determined that its review was "de novo", i.e. without deference, but individual judges protested that such review violated the general rules requiring deference to trial court findings of fact. The Circuit affirmed its de novo position in en banc decisions in 1998 and 2014.[38] But, yet again, the Supreme Court disagreed. In *Teva* (2015),[39] it

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[31]*In re* Caveney, 761 F.2d 671, 674 (Fed. Cir. 1985).

[32]*In re* Lueders, 111 F.3d 1569 (Fed. Cir. 1997).

[33]*In re* Zurko, 142 F.3d 1447(Fed. Cir. 1998) (en banc), *rev'd*, 527 U.S. 150 (1999), *on remand*, 258 F.3d 1379 (Fed. Cir. 2001).

[34]Dickinson v. Zurko, 527 U.S. 150 (1999).

[35]Cuozzo Speed Technologies, LLC v. Lee, 579 U.S. 261 (2016); SAS Institute, Inc. v. Iancu, 138 S. Ct. 1348 (2018); Thryv, Inc. v. Click-To-Call Techs., LP, 140 S. Ct. 1367 (2020).

[36]Markman v. Westview Instruments, Inc., 517 U.S. 370, 372 (1996).

[37]On *Markman* hearings, see Chisum on Patents § 18.06[2][a][vii][A] (2022).

[38]Cybor Corp. v. FAS Technologies, Inc., 138 F.3d 1448 (Fed. Cir. 1998) (in banc); Lighting Ballast Control LLC v. Philips Electronics North America Corporation, 744 F.3d 1272 (Fed. Cir. 2014) (en banc), *vacated and remanded,*135 S. Ct. 831 (2015), *aff'd*, 790 F.3d 1329 (Fed. Cir. 2015).

held that, when a construction of a term of art in a patent claim has "evidentiary underpinnings" and a district court resolves an underlying factual dispute, the Federal Circuit on appeal must review the district court's fact finding under the "clear error" standard.

The disagreement was less than might be apparent. In *Teva*, the Court agreed that the "ultimate construction" of a patent claim, based on any fact findings, remained a "legal conclusion" reviewable de novo. And the Court agreed that when a district court reviewed "only evidence intrinsic to the patent (the patent claims and specifications, along with the patent's prosecution history)," its determination was one of law and the Federal Circuit would "review that construction de novo." Since *Teva*, in most cases, the Federal Circuit has determined that a claim construction was resolvable by reference to the "intrinsic evidence", that resort to extrinsic evidence that would require fact finding was unnecessary, and thus that review was without deference.

**5. Claim Interpretation and Application**. A patent's claims define the invention for all purposes in patent law--for infringement, of course, but also for patentability and other issues, such as inventorship. Three landmark decisions, one by the Federal Circuit and two by the Supreme Court, addressed the interpretation and application of claims.

In *Phillips* (2005),[40] the Federal Circuit addressed en banc the basic approach to interpreting a claim, including the relative weight to "intrinsic evidence" (claim language, specification (written description) and prosecution history) and "extrinsic evidence" (including expert testimony). Leading up to *Phillips*, three-judge panel decisions oscillated between two opposing schools.[41] One emphasized the context of claim language, including particularly the specification and its examples.[42] The other emphasized ordinary meaning of a claim term, often derived from dictionary definitions, and allowed deviation from the meaning only when a patent clearly redefined the term or the patent owner had unmistakably disavowed ordinary meaning.[43] In *Phillips*, Judge Bryson, in a thorough opinion, synthesized elements from both schools, emphasizing the specification's importance but warning against reading limitations from the specification's examples into the claims. *Phillips* had a calming effect, but remnants of the two schools occasionally surfaced.[44]

The Supreme Court's decisions addressed the doctrine of equivalents and a significant restraint on its use, prosecution history estoppel.

The doctrine of equivalents has a venerable history in the Court, dating back to the 1853 *Winans* case,[45] in which a Court majority of five justices held a patent claim to a railroad car with a container in the shape of the frustum of a cone (i.e, circular) infringed by an accused infringer's car with an eight-sided container because the latter "substantially," though not

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[39]Teva Pharmaceuticals USA, Inc. v. Sandoz, Inc., 574 U.S. 318 (2015).

[40]Phillips v. AWH Corp., 415 F.3d 1303 (Fed. Cir. 2005) (en banc), *cert. denied*, 546 U.S. 1170 (2006).

[41] See Chisum on Patents § 18.07 (2022).

[42]E.g., Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582 (Fed. Cir. 1996)).

[43]E.g., Texas Digital Systems, Inc. v. Telegenix, Inc., 308 F.3d 1193 (Fed. Cir. 2002).

[44]Compare Thorner v. Sony Computer Entertainment America LLC, 669 F.3d 1362 (Fed. Cir. 2012) with Columbia University v. Symantec Corp., 811 F.3d 1359 (Fed. Cir. 2016).

[45]Winans v. Denmead, 56 U.S. (15 How.) 330 (1853).

literally, embodied "the patentee's mode of operation" and thereby attained "the same kind of result." Four justices dissented. The division was that which is always raised in discussions of the doctrine. Strictly enforcing literal claim scope potentially undermines the ability of competitors to determine what a patent covers but risks undermining the value of patents as incentives for innovation.

Almost a century later, the Court again applied the doctrine of equivalents in *Graver Tank* (1950).[46]

Thereafter, the regional circuits applied the doctrine, using a "range of equivalents" standard, which accorded greater equivalents to patents on "pioneer" inventions and lesser equivalents to those on mere improvements.[47]

After 1982, the Federal Circuit paid little attention to the range idea. However, its judges disputed other aspects of the doctrine, in particular, what should be the standard for equivalence, whether it should be limited to instances in which an infringer copied the patented technology (as opposed to developing its technology independently), and what the role of a jury should be. The dispute culminated in an en banc decision with multiple opinions.[48]

In *Warner-Jenkinson* (1997),[49] the Supreme Court granted review and yet again affirmed the doctrine's viability. The Court held that "intent plays no role in the application of the doctrine of equivalents." Equivalency was determined "at the time of infringement, not at the time the patent was issued." The Court sympathized with the concerns of the Federal Circuit dissenters that the doctrine had "taken on a life of its own, unbounded by the patent claims." To alleviate those concerns, it adopted the suggestion of dissenting Federal Circuit Judge Helen Nies that equivalency be applied on an element-by-element basis, not "as a whole."

On the role of juries, the Court dropped a highly significant footnote providing ""guidance, not a specific mandate" about "the concern over unreviewability due to black-box jury verdicts."[50] Summary judgment of non-infringement should be entered when "no reasonable jury could determine two elements to be equivalent." Additionally, "various legal limitations" on the doctrine of equivalents could be determined by summary judgment or by motions at trial. The limitations included "prosecution history estoppel" or "a theory of equivalence" that "would entirely vitiate a particular claim element."

On prosecution history estoppel, the Court rejected an accused infringer's argument that there should be a "rigid" rule under which a surrender of subject matter, such as by an amendment narrowing a broad claim through adding a limitation in response to a PTO examiner rejection, precluded recapture of any part of the surrendered subject matter. The Court indicated that there was a rebuttable "presumption" of surrender.

After *Warner-Jenkinson*, the Federal Circuit judges debated the impact of that decision

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[46]Graver Tank & Mfg. Co. v. Linde Air Products Co., 339 U.S. 605 1950).

[47]John Zink Co. v. National Airoil Burner Co., 613 F.2d 547, 555 (5th Cir. 1980); Nelson v. Batson, 322 F.2d 132, 136 (9th Cir. 1963).

[48]Hilton Davis Chemical Co. v. Warner-Jenkinson Co., Inc., 62 F.3d 1512 (Fed. Cir. 1995), *rev'd & remanded for further proceedings consistent with this opinion*, 520 U.S. 17 (1997), *remanded*,114 F.3d 1161 (Fed. Cir. 1997).

For a discussion of *Hilton Davis*, see Chisum on Patents § 18.04a[1][a][iii][G].

[49] Warner-Jenkinson Co., Inc. v. Hilton Davis Chemical Co., 520 U.S. 17 (1997).

[50]*Warner-Jenkinson*, 520 U.S. at 39, n8.

on prosecution history estoppel. In *Festo* (2002),[51] the Supreme Court reviewed two of the Federal Circuit's rules on prosecution history estoppel.

The first rule postulated that an estoppel arises when an applicant by amendment narrows a claim limitation for any reason relating to statutory requirements for obtaining a patent. The Court confirmed that rule. It rejected an argument that estoppel should arise only from amendments made to distinguish prior art and not from amendments made to meet Section 112's disclosure and clarity requirements.

The second rule, described as an "absolute" or "complete" bar rule, dictated that a patentee's act of amending a claim limitation during prosecution created an estoppel that bars every equivalent to the amended claim limitation. The Supreme Court rejected the Federal Circuit's absolute bar rule, deeming it an impermissible "new rule" that would unfairly diminish the scope and value of existing patents. But it also recognized the uncertainty caused by a "flexible bar" approach to the estopping effect of claim amendments. Accordingly, the Court held that if a patentee narrows a claim by adding or amending a claim limitation, it should be presumed to have surrendered all equivalents to the amended claim limitation. The patentee may rebut the presumption by showing that (1) "[t]he equivalent [was] unforeseeable at the time of the application," (2) "the rationale underlying the amendment [bore] no more than a tangential relation to the equivalent in question," or (3) there was "some other reason suggesting that the patentee could not reasonably [have been] expected to have described the insubstantial substitute in question."[52]

After *Festo*, the "no more than tangential relation" rebuttal criteria proved to be most difficult one to apply consistently. [53]

**4. Obviousness; Written Description**. That a patentable invention should be more than an obvious modification or combination of prior art teachings can hardly be questioned. It has always been the key legal condition for patentability.

Until the 1952 Act, the patent statutes articulated expressly only a requirement that a claimed invention be "new." But, starting with the 1851 *Hotchkiss* case,[54] the Supreme Court read "invention" and "new" to include an non-obviousness component. Unfortunately, instead of applying that straightforward proposition on a case-specific basis, courts purported to establish various negative and positive rules on what was and was not an "invention."[55] The Court's application of the "invention" requirement proceeded historically through patent-favorable and patent-hostile periods, the period from about 1930 through 1950 being particularly hostile.[56]

In the 1952 Act, Congress added Section 103, expressly stating the would-not-have-been-obvious-to-a-skilled-artisan standard. Some argued that the intent was to "lower" the Court's

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[51]Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., Ltd., 535 U.S. 722 (2002).

[52]*Festo*, 535 U.S. at 740-41.

[53]See, e.g., Pharma Tech Solutions, Inc. v. Lifescan, Inc., 942 F.3d 1372 (Fed. Cir. 2019); Eli Lilly & Co. v. Hospira, Inc., 933 F.3d 1320 (Fed. Cir. 2019); Ajinomoto Co. v. Int'l Trade Comm'n, 932 F.3d 1342 (Fed. Cir. 2019).

[54]Hotchkiss v. Greenwood, 52 U.S. (11 How.) 248 (1851).

[55]See Chisum on Patents § 5.04[5] (2022).

[56]See Chisum on Patents § 5.02[3] (2022).

high standard. In the 1966 *Graham* trilogy,[57] the Court disagreed and suggested that such would have been unconstitutional. It acknowledged, however, that Section 103, "when followed realistically," by both the Patent Office and the courts, was "a more practical test of patentability": "The emphasis on non-obviousness is one of inquiry, not quality, and, as such, comports with the constitutional strictures."[58]

After *Graham*, the regional circuits laced the Section 103 condition with sundry non-statutory variants. For example, the Ninth Circuit, sitting en banc and resolving conflicting panel opinions, indicated that the test for a "combination patent" was "unusual or surprising results," not "synergism."[59]

After its creation in 1982 with essentially exclusive appellate jurisdiction, the Federal Circuit swept away such variants.[60] It did so even though two post-*Graham* Supreme Court decisions, *Anderson' Black Rock* (1969)[61]and *Sakraida* (1976),[62] had seemingly reaffirmed pre-1952 Act "invention" rules.

In *KSR* (2007),[63] the Supreme Court held the Federal Circuit itself guilty of applying a "rigid" rule on obviousness, one requiring that the prior art provide a "teaching, suggestion or motivation" to combine prior art elements. The Court's opinion discussed, without disapproval, *Anderson' Black Rock* and *Sakraida*. It also rejected a general rule against using "obvious to try."

After *KSR*, Federal Circuit panels reiterated that *KSR* did not eliminate a requirement that there be a reason (or motivation) to combine or modify the prior art. They also focused on a requirement that there be a reasonable expectation of success.

Given the importance of the non-obviousness condition, the frequency with which it arises, and the difficulty of applying it in various fields of technology, it is not surprising that differences of opinion arose among Federal Circuit judges and were reflected in panel opinions with varying if not conflicting language. The opinions cited different statements in *KSR* to support conclusions of obviousness and no obviousness.

To date, only one en banc decision has attempted half-heartedly to resolve these conflicts. In *Apple Inc. v. Samsung Electronics Co., Ltd.* (2016) (en banc),[64] the Federal Circuit overturned a panel decision that had reversed a jury verdict of no-obviousness. The majority stressed that it was *not* addressing any "important legal questions about the inner workings of the law of

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[57]Graham v. John Deere Co., 383 U.S. 1 (1966) (with Calmar v. Cook Chem. Co.); United States v. Adams, 383 U.S. 39 (1966).

[58]*Graham*, 383 U.S. at 17.

[59]Sarkisian v. Winn-Proof Corp., 688 F.2d 647 (9th Cir. 1982) (en banc).

[60]E.g., American Hoist & Derrick Co. v. Sowa & Sons, Inc., 725 F.2d 1350, 1360 (Fed. Cir. 1984) (no synergism requirement); Richdel, Inc. v. Sunspool, 714 F.2d 1573, 1580 (Fed. Cir. 1983) ("invention" gone); Stratoflex, Inc. v. Aeroquip Corp., 713 F.2d 1530 1540 (Fed. Cir. 1983) ("combinations" not a special category).

[61]Anderson's-Black Rock, Inc. v. Pavement Salvage Co., 396 U.S. 57 (1969).

[62]Sakraida v. Ag Pro, Inc., 425 U.S. 273 (1976).

[63]KSR International Co. v. Teleflex Inc., 550 U.S. 398 (2007). On *KSR*, see Chisum on Patents § 5.02[9] (2022).

[64]Apple Inc. v. Samsung Electronics Co., Ltd., 839 F.3d 1034 (Fed. Cir. 2016) (en banc).

obviousness."[65] The majority did affirm the relevance of "objective evidence" of non-obviousness, including commercial success, industry praise, copying, and long-felt need.

Despite its recognition that there should be no special, extra-statutory rules on what is an "invention" in applying the nonobviousness condition for patentability, the Federal Circuit effectively created such a rule in applying the Section 112 requirement that a patent specification include, as of its priority date, a written description of "the invention" in addition to an enabling disclosure of how to make and use it. The written description requirement undoubtedly plays a key role in preventing an applicant from retroactively claiming to have invented subject matter by changing claims through post-filing amendments or in continuing applications.[66] In this priority policing mode, a written description analysis compares a claim to the description. However, in *Eli Lilly* (1997),[67] a Federal Circuit panel held that an application specification could fail to provide a written description of the invention recited in a claim in that specification (i.e., an "original claim"). The panel announced its new rule was despite the explicit provision in Section 112 making claims part of the specification and the unquestioned principle that a claim defines an invention. *Eli Lilly* reasoned that a specification failed to show "possession" of an invention, even one explicitly claimed, when it delineated the invention generically and in terms of function rather than structure, providing only a "mere wish" or "plan" for obtaining a claimed invention rather than examples of it (working or constructive). The subsequent 2010 en banc *Ariad* decision confirmed *Eli Lilly*.[68] Thus, decisions after *Eli Lilly* applied the Section 112 written description requirement to hold unpatentable claims deemed to be generic and functional even when the claims were in a prior application as filed and even assuming that the application provided an enabling disclosure.[69]

With Section 112, as with Section 103, the proper course would have stuck to the statute and not indulged in judicial speculation on what was an "invention" and whether an invention, which was described by a claim and supported by an enabling disclosure, was sufficiently completed. No doubt unduly broad, functional claims should be held improper.[70] However, the separate statutory requirement of enablement was available and had been interpreted by the Supreme Court since 1854 as precluding such claims.[71] To avoid confusion, there should be one set of rules for evaluating the adequacy of disclosure to support a broad claim, not two. *Non multiplicantur res extra necessitatem*.

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[65]*Apple*, 839 F.3d at 1039.

[66]E.g., Quake v. Lo, 928 F.3d 1365 (Fed. Cir. 2019)

[67]Regents of University of California v. Eli Lilly & Co., 119 F.3d 1559 (Fed. Cir. 1997), *cert. denied*, 523 U.S. 1089 (1998),

[68]Ariad Pharmaceuticals, Inc. v. Eli Lilly & Co., 598 F.3d 1336 (Fed. Cir. 2010) (en banc).

[69]E.g., Nuvo Pharmaceuticals (Ireland) Designated Activity Company v. Dr. Reddy's Laboratories Inc., 923 F.3d 1368 (Fed. Cir. 2019).

[70]Cf. Juno Therapeutics, Inc. v. Kite Pharma, Inc., 10 F.4th 1330 (Fed. Cir. 2021) (overturning jury verdict of no written description violation by broad claim to chimeric antigen receptor (CAR) T-cell therapy, the verdict including a $1,200,322,551.50 damage award).

[71]O'Reilly v. Morse, 56 U.S. (15 How.) 62 (1854).

**3. Creation of Federal Circuit.** In 1982, Congress created the Federal Circuit by combining the seven judgeships of the Court of Claims with the five of the Court of Customs and Patent Appeals. It gave the Federal Circuit near exclusive appellate jurisdiction over patent cases, including appeals from district court decisions as well as those from the PTO and the International Trade Commission. No change in appellate structure had attained such significance since Congress created the intermediate "regional" courts of appeal in 1892 (which greatly relieved the Supreme Court of routine appeals in patent cases).[72]

Why did Congress do it? And has the experiment succeeded?

Suggestions that Congress gave the Federal Circuit exclusive jurisdiction to "strengthen" the patent system overlooked a fundamental principle of the Constitution: an Article III court is independent of the political branches of government and cannot be given any task other than deciding judicial cases applying the law. If Congress desired to strengthen patents, it needed to have amended the statutes. It did not and has not (with the exception of 1984 and 2011 amendments that altered what constitutes prior art).[73]

Did creation of the Federal Circuit nevertheless have the *effect* of strengthening patents? After the 1970's, the percentage of patents held not invalid rose. But whatever "anti-patent" bias was shown in some of the regional circuits might well have changed in the 1980's (without creation of a Federal Circuit) due to increased perception of the value of intellectual property, especially with the growing impact of international trade on the U.S. economy.

Two related and more defensible purposes for taking patent cases out of the hands of the regional circuits were to increase consistency and predictability in the application of patent law and to reduce "forum-shopping", that is, parties seeking to maneuver a case into a district court in a favorable circuit. The regional circuits had reputations, whether deserved or not, for widely-varying attitudes about patentability. For example, patents were almost always upheld in the Fifth Circuit and almost never in the Eighth. Indeed, a conflict in the rulings of the Fifth and Eighth Circuits on the validity of the same patent caused the Supreme Court to grant certiorari in the 1966 *Graham* case. The Court held that neither circuit had applied the correct test for obviousness.

The Federal Circuit's exclusive jurisdiction eliminated circuit shopping. However, a another form of forum of shopping developed: to obtain a favored district court, such as the Eastern or Western districts in Texas, a phenomenon the Circuit had facilitated with its *VE Holdings* venue ruling.

The Federal Circuit provided less consistency and predictability than might have been hoped for because of panel variation. Cases are decided by rotating panels of three of the up to 12 judges. Prior opinions might show that judges N and S tended to find patents not obvious but judges D and P tended to find them obvious. A given patent's chances would then be better before a panel of N, S and D than before one with N, D and P. Parties could not "shop" for a panel as they previously shopped the circuits because a party could not predict which judges would be on a panel. But panel variation ran counter to a fundamental principle of the law: like cases should be decided alike and without regard to which judges are on a panel.

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[72] On the 1892 Act and its significance for patent litigation, see Chisum on Patents § 5.02[2] (2022).

[73] On the 1984 Amendment, see Chisum on Patents § 5.02[7], § 5.03[3][c][vi], § 9.05[4] (2022). The 2011 AIA is discussed below.

Varying views of the judges also left some important issues of law unsolved or subject to conflicting resolution for long periods until resolved en banc or by the Supreme Court. Examples included, as discussed above, the tests for the doctrine of equivalents, prosecution history estoppel, and the proper approach to claim construction. A particularly stark example was a schism on whether a patent's product-by-process claim was infringed when an accused infringer made the same product using a different process. The schism arose in 1992.[74] It went unresolved until 2009![75]

Another example is the on sale bar to patentability. The judges split on whether a reduction to practice was required of an invention to be "on sale." The Supreme Court finally resolved the issue in *Pfaff* (1998).[76] A further controversy concerned whether experimental use negating a public use bar ended with a reduction to practice. In an en banc decision, *Medicines* (2016),[77] the Federal Circuit declined to address the issue.

Other divisions remain subtle but important. When does a generic drug maker's label induce infringement of a treatment method claim?[78] When does an unclaimed feature in a successful product preclude a presumption that a nexus connects the product's success and the merits of the claimed invention?[79]

**2. Section 101 Ineligibility: Death and Revival**. A development of undeniable importance during the 50 year period was the Supreme Court's erratic and irrational interpretation of the Section 101 definition of patent eligible subject matter. The Court's ineligibility decisions were surprising as well as disturbing because the statutory language, which covers any machine, manufacture, composition of matter, or process, has remained essentially unchanged since 1791.

In the 1972 *Benson* case,[80] a truncated Court held that a patent's claim to a mathematical algorithm useful for converting numbers was an unpatentable abstract idea. The short opinion by Justice Douglas was unanimous but only six justices participated.

The *Benson* opinion was poorly reasoned, as I demonstrated in a 1986 law review article.[81] The decision effectively validated the Patent Office's de facto policy not to allow

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[74]Compare Atlantic Thermoplastics Co., Inc. v. Faytex Corp., 970 F.2d 834 (Fed. Cir. 1992), *suggestion for reh'g en banc declined*, 974 F.2d 1279 (Fed. Cir. 1992) with Scripps Clinic & Research Foundation v. Genentech, Inc., 927 F.2d 1565 (Fed. Cir. 1991).

[75]Abbott Laboratories v. Sandoz, Inc., 566 F.3d 1282 (Fed. Cir. 2009).

[76]Pfaff v. Wells Electronics, 525 U.S. 55 (1998). For a discussion of *Pfaff*, see Chisum on Patents § 6.02[2][l], § 6.02[6][a] (2022).

[77] Medicines Company v. Hospira, Inc., 827 F.3d 1363 (Fed. Cir. 2016) (en banc). For a discussion of Medicines, see Chisum on Patents § 6.02[6][d][ii] (2022).

[78]Compare GlaxoSmithKline LLC v. Teva Pharmaceuticals USA, Inc., 7 F.4th 1320 (Fed. Cir. 2021), *rehearing en banc denied*, 25 F.4th 949 (Fed. Cir. 2022) with Takeda Pharms. U.S.A., Inc. v. West-Ward Pharm. Corp., 785 F.3d 625 (Fed. Cir. 2015).

[79]Compare Quanergy Systems, Inc. v. Velodyne Lidar USA, Inc., 24 F.4th 1406 (Fed. Cir. 2022) with Teva Pharmaceuticals Int'l GMBH v. Eli Lilly & Co., 8 F.4th 1349 (Fed. Cir. 2021); Fox Factory, Inc. v. SRAM, LLC, 944 F.3d 1366, 1374 (Fed. Cir. 2019).

[80]Gottschalk v. Benson, 409 U.S. 63 (1972).

[81]Chisum, *The Patentability of Algorithms*, 47 University of Pittsburgh Law Review 959

"software" patents, a policy encouraged by a computer hardware manufacturer that later accumulated a huge portfolio of such patents.[82] The Office's policy probably had long-term negative effects on the quality of such patents when they did begin to emerge. If the Office had earlier examined and issued appropriately narrow software patents, their full disclosures would have been available as prior art in examining later applications.

At almost precisely the time I finished work on the treatise, a line of decisions by the Court of Customs and Patent Appeals had effectively cabined *Benson*.[83] However, just as the treatise appeared in 1978, the Supreme Court extended *Benson*, in *Flook* (1978),[84] a 5-4 decision, holding that an unpatentable mathematical formula did not become patentable subject matter by the addition of "conventional, post-solution applications." Thus were ineligible applicant Flook's claims to a method for updating the value of an "alarm limit" on a variable involved in a process of catalytic chemical conversion of hydrocarbons. That a specific improvement in an industrial process should be per se excluded from patenting was a truly disturbing result.

But despair at perpetuated irrationality abated for a time when, shortly after *Flook*, the Court rendered two decisions. In *Chakrabarty* (1980),[85] it held that the Office could not reject as ineligible claims to a genetically-modified bacterium. Importantly, the Court noted that it was up to Congress to provide exceptions to the Patent Act's broad Section 101 definition of patentable subject matter. The dissent did not dispute that Section 101 was broad but argued only that two plant protection statutes indicated a Congressional intent to protect only some kinds of "animate inventions."

In *Diehr* (1981),[86] another 5-4 decision, the Court held eligible a claim to a process for curing synthetic rubber, which included in one of its steps the use of a long-known mathematical formula and a programmed digital computer. Essentially, in relevant respects, the claims in *Flook* and *Diehr* were indistinguishable from those in *Flook*. If anything, there was a stronger case for the patentability of the *Flook* claims because the claim's calculation method or algorithm was asserted to be new whereas the formula in the *Diehr* claims was admittedly known. Unfortunately, apparently in deference to the principle of stare decisis (precedent), the majority in *Diehr* nominally distinguished *Flook* rather than overruling it (and *Benson*) as inconsistent with the principle *Chakrabarty* recognized.

Thus, by the time the Federal Circuit came into being in 1982, *Benson* was, effectively, dead. And so it remained until a trio of Supreme Court decisions revived it: *Bilski* (2010),[87] *Mayo* (2012),[88] and *Alice* (2014).[89] *Mayo* added "law of nature" to "abstract idea" as an ineligible concept. In contrast, in a partial victory for rationality, the Court in *AMP* (2013)[90] held

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(1986).

[82]See Chisum, *Patenting Intangible Methods: Revisiting* Benson *(1972) After* Bilski *(2010*), 27 Santa Clara Computer & High Technology Law Journal 445 (2011).

[83]The culminating decisions was *In re* Musgrave, 431 F.2d 882 (CCPA 1970).

[84]Parker v. Flook, 437 U.S. 584 (1978).

[85]Diamond v. Chakrabarty, 447 U.S. 303 (1980).

[86]Diamond v. Diehr, 450 U. S. 175 (1981).

[87]Bilski v. Kappos, 561 U.S. 593 (2010).

[88]Mayo Collaborative Services v. Prometheus Laboratories, Inc., 566 U.S. 66 (2012).

[89]Alice Corp. Pty. Ltd. v. CLS Bank Int'l, 573 U.S. 208 (2014).

[90]Association for Molecular Pathology v. Myriad Genetics, Inc., 569 U.S. 576 (2013).

that isolated DNA was not eligible because it was a product of nature but that synthetically-created (complementary) DNA was eligible.

This is not the place to excessively parse the Court's cases. But note an interesting fact: the 1978 to 1981 cases all involved appeals from a reluctant Patent Office (as did *Bilski*) whereas the 2012-2014 cases involved invalidating issued patents.

Sufficing to show the uncertainty of what the Court expounded on ineligibility is the number of Federal Circuit decisions reaching varying results.[91] After six years of applying and attempting to clarify *Alice* and *Mayo*, the Federal Circuit in 2020 issued 11 precedential opinions: seven held claims ineligible,[92] six eligible.[93]

Will the Court revisit *Benson-Mayo-Alice*? A good candidate would have been *American Axle* (2020),[94] in which a panel majority held that a method of making a car part was an ineligible natural law. Unfortunately, the Court recently denied certiorari review of that case.

If the Court does eventually take another Section 101 eligible subject matter case, one can hope that the Court will not attempt to simply refine and clarify. Instead, it should drive a stake into the heart of *Benson*.

The Supreme Court is the primary culprit in the crime of Section 101 confusion, but Congress has been compliant. In several sections of the AIA, it evidenced awareness of the problem but explicitly declined to address it. For example, the AIA's Section 18 provided for post-grant review of business method patents but cautioned: "Nothing in this section shall be construed as amending or interpreting categories of patent-eligible subject matter set forth under section 101 of title 35, United States Code."

**1. AIA: Post-Issuance Review.** The 2011 enactment of the America Invents Act by Congress was the number one development in U.S. patent law over the past 50 years.[95]

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[91]For a discussion of all these cases, see Chisum on Patents § 1.03[6][o] (2022).

[92]*In re* Rudy, 956 F.3d 1379 (Fed. Cir. 2020); Bozeman Financial LLC v. Federal Reserve Bank of Atlanta, 955 F.3d 971, 980 (Fed. Cir. 2020); Customedia Technologies, LLC v. Dish Network Corp., 951 F.3d 1359 (Fed. Cir. 2020); Simio, LLC v. Flexsim Software Products, 983 F.3d 1353 (Fed. Cir. 2020); American Axle & Manufacturing, Inc. v. Neapco Holdings LLC, 967 F.3d 1285 (Fed. Cir. 2020), *revising*, 939 F.3d 1355 (Fed. Cir. 2019), *rehearing en banc denied*, 966 F.3d 1347 (Fed. Cir. 2020); Electronic Communication v. ShoppersChoice.com, LLC, 958 F.3d 1178 (Fed. Cir. 2020); Ericsson Inc. v. TCL Communication Technology, 955 F.3d 1317 (Fed. Cir. 2020).

[93]TecSec, Inc. v. Adobe Inc., 978 F.3d 1278 (Fed. Cir. 2020), discussed § 1.03[6][o][ix][I]; XY, LLC v. Trans Ova Genetics, LC, 968 F.3d 1323 (Fed. Cir. 2020); Packet Intelligence LLC v. NetScout Systems, Inc., 965 F.3d 1299 (Fed. Cir. 2020); Uniloc USA, Inc. v. LG Electronics USA, Inc., 957 F.3d 1303 (Fed. Cir. 2020); CardioNet, LLC v. InfoBionic, Inc., 955 F.3d 1358 (Fed. Cir. 2020); Illumina, Inc. v. Ariosa Diagnostics, 952 F.3d 1367 (Fed. Cir. 2020), *modified*, 967 F.3d 1319 (Fed. Cir. 2020).

[94]American Axle & Manufacturing, Inc. v. Neapco Holdings LLC, 967 F.3d 1285 (Fed. Cir. 2020), *revising*, 939 F.3d 1355 (Fed. Cir. 2019), *rehearing en banc denied*, 966 F.3d 1347 (Fed. Cir. 2020).

[95]Integrating a major statutory revision into a multiple volume treatise presents challenges.

On substantive patent law, the AIA prospectively switched from a first-to-invent to a first-to-file priority system and revised the definition of prior art in Section 102. In that respect, the AIA was a third stage in the shift of the U.S. patent system toward the model adopted by most other countries. The first stage was the 1995 adoption of the 20-year-from-effective-filing date patent term to replace the prior 17-year-from-issuance term. The second stage was the 1999 adoption of 18-month publication of patent applications. Those changes ended the unfortunate phenomenon of "submarine" patents issuing many years after their filing date. However, the changes were prospective, and, for over two decades, patents continued to issue with 17-year terms based on pre-June 8, 1995, filing dates.[96]

Even more significant than its substantive law change were the AIA's provisions on post-issuance review by a PTO Board.

The AIA's importance is confirmed by one simple fact. The Supreme Court decides few cases at all and very few on patent law, but the Court has a sense for "where the action is." In the first eight years of AIA post-grant review, it granted certiorari in six cases: five on aspects of post-issuance review,[97] and one on whether the AIA altered the Section 102 "on sale" bar (holding that it did not).[98]

A major attraction of inter partes review (IPR) and post-grant review (PGR) to a challenger and potential accused infringer is the opportunity to have an adjudication of issues of patentability (anticipation and obviousness), without discovery on the full ranges of issues in an infringement suit and before an expert tribunal instead of a jury in a district court suit.

In enacting the AIA's post-issuance procedures, Congress expressed its hope that they would, unlike the prior inter partes reexamination procedure, "serve as an effective and efficient alternative to often costly and protracted district court litigation."[99] Have they succeeded?

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When Congress enacted a new copyright statute in 1976, Professor Nimmer chose to stop revising his original version of Nimmer on Copyrights and took the time to prepare a second edition.

The AIA did not so comprehensively change patent law, and the vast bulk of case law on patent law remains applicable. Therefore, I prepared a special section entitled "America Invents Act of 2011: Analysis and Cross-References," which analyzed in detail the statute with its legislative history and the PTO's implementing regulations. That section remains unchanged.

I also added sections in the relative parts of the existing chapters. For example, Section 11.07[5] covers inter partes and post-grant review. It is regularly revised to account for case law and for changes. It shows how quickly the body of case law addressing procedural and jurisdictional issues on IPR and PGR has grown.

[96]E.g. Immunex Corporation v. Sandoz Inc., 964 F.3d 1049 (Fed. Cir. 2020) (patent issuing 2011 based on 1990 priority application and May 1995 divisional application).

Compare Hyatt v. Hirshfeld, 998 F.3d 1347 (Fed. Cir. 2021) (affirming PTO authority to apply "prosecution laches").

[97]Cuozzo Speed Technologies, LLC v. Lee, 579 U.S. 261 (2016); SAS Institute, Inc. v. Iancu, 138 S. Ct. 1348 (2018); Oil States Energy Services, LLC v. Greenes Energy Group, LLC, 138 S. Ct. 1365 (2018); Return Mail, Inc. v. United States Postal Serv., 139 S. Ct. 1853 (2019); Thryv, Inc. v. Click-To-Call Techs., LP, 140 S. Ct. 1367 (2020).

[98]Helsinn Healthcare S.A. v. Teva Pharmaceuticals USA, Inc. 139 S. Ct. 628 (2019).

[99]H.R. Rep. No. 112-98 at 45 (June 1, 2011).

**0. The Promised Bonus: Growth in the Profession**. And now the bonus. A significant development over the past 50 years was the growth and change in the profession. Before, patent practice was concentrated in relatively small firms located primarily in a few cities. Today, it is vastly larger and more diverse. The growth was attributable in a significant part to the emergence of commercial biotechnology and, less positively, to the proliferation of patent litigation, including suits by "non-practicing entities."

Of particular relevance to my work as a scholar is the extent of academic focus on the patent system. As of the 1970s, there were few law schools that offered even a single course covering patent law, and there were almost no full time professors who listed patent law as among their interests. Now, there are many schools offering programs and multiple courses.

As a young law professor, I began work on a treatise on United States patent law rather than concentrate on the type of law review articles generally expected for advancement in legal academia. I had become fascinated by the history of the patent system and its role in the workings of the federal judiciary but was frustrated by the absence of up-to-date treatises and reference texts comparable to those on copyright, trademark, bankruptcy and other areas of federal law. But today, we are blessed with an outpouring of legal scholarship on patents by full time professors and others.[100]

[100]Particularly significant to me is the excellent two-volume treatise by my partner at the Academy (and spouse), Janice Mueller. See Janice M. Mueller, Mueller on Patent Law (Fastcase/Full Court Press 2020).