

Michigan Technology Law Review

Volume 25

Article 4

2019

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Recommended Citation

Jonathan I. Tietz, *The Unified Patent Court and Patent Trolls in Europe*, 25 MICH. TELECOMM. & TECH. L. REV. 303 (2019).

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THE UNIFIED PATENT COURT AND PATENT TROLLS IN EUROPE

Jonathan I. Tietz*

Healthy organisms inevitably produce cancer cells, and vibrant patent systems inevitably let bad patents slip through. These patents are harnessed by entities that leverage the uncertainty and expense of litigation to extract licenses from technological practitioners. Post-issuance patent review (PIPR) has emerged as an invaluable error-correcting mechanism to prevent the socially harmful assertion of improperly issued patents. The United States, with the America Invents Act, established a new system for PIPR, expanding administrative routes to curtail bad patents. Europe is going a step further with the Unified Patent Court Agreement (UPCA). The UPCA enables a low-cost patent revocation action on a broad range of grounds and with a relaxed standing requirement. But this is an opt-in system with a loser-pays fee-shifting arrangement. Thus, although the structure of the Unified Patent Court (UPC) appears to be set up to facilitate efficient PIPR, the disincentives for opting in suggest that the UPC will be a less effective troll-fighting vehicle than expected. Indeed, patent trolls may simply opt for national patent systems.

TABLE OF CONTENTS

INTRODUCTION	304
I. THE IMPORTANCE OF POST-ISSUANCE PATENT REVIEW	305
A. <i>The Bad Patent Problem</i>	305
B. <i>Paying the Troll Toll: Impact and Drivers of Troll Activity</i>	306
C. <i>The Role of Post-Issuance Patent Review</i>	307
II. STRUCTURES OF EXISTING POST-ISSUANCE PATENT REVIEW SYSTEMS IN THE UNITED STATES AND EUROPE.....	308
A. <i>The United States</i>	308
B. <i>Europe</i>	310
III. THE EUROPEAN UNION'S UNIFIED PATENT COURT (UPC).....	312
A. <i>The Status of the UPC</i>	313
B. <i>General Structure of the UPC</i>	315

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C. <i>Post-Issuance Patent Review under the UPCA</i>	316
IV. COMPARISON OF THE UPC AND US PIPR THROUGH THE LENS OF THE PATENT TROLL PROBLEM.....	322
A. <i>The UPC Promises a Much More Expansive Post- Issuance Patent Review System</i>	322
B. <i>The UPC May Inadvertently Disincentivize Patent Owners from Participation</i>	325
CONCLUSION.....	330

INTRODUCTION

In 2013, twenty-five European Union member states signed the Agreement on a Unified Patent Court (UPCA), which establishes a new category of international patent under the exclusive jurisdiction of a centralized Unified Patent Court (UPC). The UPCA is meant to unify patent rights, decrease litigation and administration costs, and provide a means for improved post-issuance correction of erroneous patents. In part, this is intended to curtail the practices of so-called patent trolls, nonpracticing patent-owning entities that assert bad patents against practicing third parties.

Structurally, the system is remarkably broad compared to those already in Europe and the United States. Compared to post-issuance patent review (PIPR) in the United States, the UPC could function as a more effective error-correction mechanism. Under the UPCA, revocation actions will be available for essentially any substantive ground of unpatentability, with amendment of the patent in question available as an alternative to wholesale revocation. On the other hand, several structural features suggest that UPCA may not effectively prevent patent-troll behavior. Namely, the combination of an apparently lax standing requirement, a loser-pays fee-shifting structure, a lack of judicial review, and a lack of preemption of national patent laws may dissuade unitary patent filings. This is especially likely because the patents most valuable to patent trolls are, due to geographical industrial asymmetry, only valuable in certain states. That is, the opt-in cost may outweigh the benefits.

This Note contends that the seemingly effective error-correction mechanisms created by the UPC may actually go too far, being too costly for patent owners to opt into the system. Part I outlines the importance of PIPR, particularly in the context of patent trolls. Part II reviews the structures of existing PIPR systems in the United States and Europe. Part III characterizes the structure of PIPR under the UPC. Part IV views this structure through the lens of patent trolls, compares it with the United States, and asserts that certain aggressive features may nudge patent trolls to opt for national patent systems instead.

I. THE IMPORTANCE OF POST-ISSUANCE PATENT REVIEW

Many consider strong patent protection to be essential for innovation.¹ But overprotection of intellectual property can impede scientific and economic progress.² Accordingly, the structure of any given patent examination system reflects pragmatic compromises. The result is that even in a vibrant, innovation-rich patent system, two troublesome problems emerge.

First, bad, overbroad patents inevitably slip through. Second, there are perverse economic incentives to take advantage of these bad patents in the context of other structural elements of a patent protection system. The result? So-called patent trolls.³

A. The Bad Patent Problem

Every patent system includes substantive patentability requirements.⁴ The novelty and inventive-step (or non-obviousness)⁵ requirements are the most fundamental. These “doctrinal screens” are meant to ensure that the exclusivity of a patent is only available to truly new inventions. Any ineffectiveness of administering certain doctrinal screens might inadvertently

1. See, e.g., Dan L. Burk & Mark A. Lemley, *Policy Levers in Patent Law*, 89 VA. L. REV. 1575, 1576 (2003) (“Patent law is our primary policy tool to promote innovation, encourage the development of new technologies, and increase the fund of human knowledge.”). But see Rachel E. Sachs, *The Uneasy Case for Patent Law*, 117 MICH. L. REV. 499 (2018).

2. See, e.g., Rebecca S. Eisenberg, *Technology Transfer and the Genome Project: Problems with Patenting Research Tools*, 5 RISK: HEALTH, SAFETY & ENV’T 163, 175 (1994) (“Overprotecting intellectual property is as harmful as underprotecting it.” (quoting *Vanna White v. Samsung Elecs. Am., Inc.*, 989 F.2d 1512, 1513 (9th Cir. 1993))); see also Michael A. Heller & Rebecca S. Eisenberg, *Can Patents Deter Innovation? The Anticommons in Biomedical Research*, 280 SCIENCE 698 (1998) (noting problems of patent overprotection even in technologies where patents are typically considered essential).

3. The patent troll problem is not strictly limited to bad patents. In a practice referred to as “holdup,” a nonpracticing owner of an otherwise valid patent waits to enforce patent rights until it is strategic to do so—for instance, not when first learning that another company has infringed but perhaps when the company has been particularly successful. In the absence of laches defenses, this practice seems troublesome: after all, the nonpracticing patent owners are not themselves practicing, or even licensing, the patented technology and is thus not economically harmed by infringement; in contrast, the infringer is arguably increasing the public good and is harmed by relying on the patent owner’s non-assertion (especially when the vast universe of patents in densely crowded fields makes accidental infringement likely). But where the patent is technically valid and in compliance with the underlying standards of patentability, it is not normatively obvious that this is the same problem, especially in the absence in law of a patent use requirement. In contrast, the assertion of improperly issued, technically flawed patents plainly frustrates the purpose of the patent system and is difficult to defend. Accordingly, a thorough discussion of structural (dis)incentives of holdup-style patent trolling in the context of the European Union is beyond the scope of this manuscript.

4. These are also called “doctrinal screens.” Christopher Buccafusco et al., *Intelligent Design*, 68 DUKE L.J. 75 (2018) (discussing the role of doctrinal screens in calibrating intellectual property rights).

5. In contrast to much of the world, the United States’s term for “inventive step” is “non-obviousness.” See 35 U.S.C. § 103 (2012).

allow overbroad patents to issue. But one of the fundamental causes of bad patents is simply inherent in the nature of progress. The universe of known technologies grows each day;⁶ the time spent on patent examination does not.⁷ Thus, patents that impermissibly overlap with known technology are frequently issued in error.⁸

B. *Paying the Troll Toll: Impact and Drivers of Troll Activity*

Structural features of patent law incentivize taking advantage of bad patents through a practice known as patent trolling.⁹ Patent trolls are nonpracticing owners of patents¹⁰ who seek out potential infringers, wait for the infringers to find financial success, and then threaten to sue, hoping to obtain favorable settlements. Trolls often rely on vaguely worded patents with uncertain scopes.¹¹

Patent litigation is expensive, complex, and uncertain—in the face of complicated technologies and at-times-fuzzy patent doctrines, determining infringement is difficult, especially for generalist judges and lay juries. So even if an asserted patent is *probably* bad, a defendant is likely to settle simply to mitigate the nuisance, risk, and expense of the lawsuit.

How substantial is the problem? Patent troll behavior hampers innovation and generates waste, both in terms of litigation resources and lost wealth—to the tune of hundreds of billions of dollars.¹² There is generally

6. It is hard to overstate the volume of previous technology. Relevant prior art includes all previous patents, written publications, products, and public presentations, among other forms prior art. More than ten million utility patents have been issued. *10 Million Patents*, USPTO, <https://10millionpatents.uspto.gov/> (last visited Nov. 14, 2018). Scientific journal articles are more numerous—in excess of fifty million as of 2009. Sarah Boon, *21st Century Science Overload*, CAN. SCI. PUB. (Jan. 7, 2017), <http://blog.cdnsiencepub.com/21st-century-science-overload/>. Even with clever keyword searching, these are difficult to thoroughly compare against an application in a few hours.

7. See R. Polk Wagner, *Understanding Patent-Quality Mechanisms*, 157 U. PA. L. REV. 2135, 2138 (2009) (“[G]iven the number of annual filings, it is hard to imagine any scenario in which enough resources could be directed toward this effort to have a meaningful impact.”).

8. See generally *id.* at 2145–58 (reviewing general contributors to low patent quality).

9. Patent trolls are also commonly referred to as “nonpracticing entities” (NPEs) or “patent assertion entities” (PAEs), among other terms. See Edward Lee, *Patent Trolls: Moral Panics, Motions In Limine, and Patent Reform*, 19 STAN. TECH. L. REV. 113, 116 (2015).

10. See Ted Sichelman, *Commercializing Patents*, 62 STAN. L. REV. 341, 368 (2010) (“[N]onpracticing entities (NPEs)—namely, firms that do not commercialize their patented inventions and perform little to no R & D—are often termed ‘patent trolls,’ because they tend to exploit litigation and licensing market defects to extract unwarranted rents from commercializers, usually on patents that the commercializer was completely unaware of before the NPE’s demand for payment.”).

11. See James Bessen et al., *The Private and Social Costs of Patent Trolls*, 34 REGULATION 26, 26 (2011–2012); see also Mark A. Lemley, *Scope*, 57 WM. & MARY L. REV. 2197, 2240–43 (2016); *supra* note 11.

12. See Bessen et al., *supra* note 11, at 26 (finding that patent troll lawsuits “are associated with half a trillion dollars of lost wealth to defendants from 1990 through 2010”).

less of a troll problem in Europe than in the United States, but the UPC may affect troll activity.¹³ Additionally, the growth of high-tech markets in the European Union may increasingly attract trolls.¹⁴

Many factors empower trolls. These include the size and wealth of a particular market, the availability of forum-shopping, the nature of fee-shifting structures, the prevalence of bad patents, the expense of litigation for patent owners, the extent of ex ante uncertainty, and the remedies available to patent owners.¹⁵ Certain corrective systems have emerged in response.

C. *The Role of Post-Issuance Patent Review*

In the face of bad patents and those who exploit them, the importance of patent-issuance error-correction has been recognized.¹⁶ After all, the assertion of a patent that never should have been granted is wasteful. Thus, a variety of post-issuance systems exist for review of patent validity.

A word on terminology. Here, the term “post-issuance patent review” (PIPR) means any judicial or administrative proceeding in which the patent’s validity is reconsidered after the issuance of a patent.¹⁷

Administrative PIPR procedures have been implemented in part to facilitate error-checking of bad patents and to mitigate the effects of patent trolls. For instance, the legislative history of the America Invents Act (AIA), passed in 2011,¹⁸ highlights fighting patent trolls as a motivating factor behind much of that legislation.¹⁹ Indeed, the availability of PIPR seems both to impede patent trolls²⁰ and to lower patent litigation costs.²¹

13. See generally Stefania Fusco, *Markets and Patent Enforcement: A Comparative Investigation of Non-Practicing Entities in the United States and Europe*, 20 MICH. TELECOMM. & TECH. L. REV. 439 (2014) (examining the extent of patent troll activity in Europe).

14. See Andrews Bartels, *European Tech Market Expected to Continue Slow Growth Through 2018*, ZDNET (Aug. 16, 2017, 13:29 PDT), <http://www.zdnet.com/article/european-tech-market-will-continue-to-grow-slowly-at-around-2-in-euros/> (predicting growth, if modest, in the European technology sector).

15. See generally Lauren Cohen et al., *Patent Trolls: Evidence from Targeted Firms* (Nat’l Bureau of Econ. Research Working Paper No. 20322, April 2016), <http://www.nber.org/papers/w20322> (discussing empirical findings as to factors driving patent trolls).

16. See, e.g., Wagner, *supra* note 7, at 2161 (identifying post-issuance patent review as a general, frequently proposed vehicle for improving patent quality).

17. These are called, depending on the country, invalidity, revocation, or nullity actions.

18. Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011).

19. See generally Joe Matal, *A Guide to the Legislative History of the America Invents Act: Part II of II*, 21 FED. CIR. B.J. 539 (2012).

20. See Joe Mullin, *New Patent Review Process Saves Billions—So Why Is It Under Attack?*, ARS TECHNICA (Sept. 19, 2017, 8:51 AM), <https://arstechnica.com/tech-policy/2017/09/new-patent-review-process-has-saved-billions-so-why-is-it-under-attack/>; see also Jason Rantanen, *Inter Partes Review Statistics*, PATENTLY-O (July 28, 2016),

Enabling PIPR, in effect, recognizes that market participants are more efficient than a disinterested, resource-limited patent office at flagging patentability issues and identifying prior art.²² But the structure of a given PIPR system is highly significant. A PIPR system might be too punitive to legitimate patent owners or too inaccessible to patent challengers. Ideally, PIPR provides specialized mechanisms to adjudicate patent validity at low cost with high accuracy. To accommodate legitimate patents that might be only slightly overbroad, PIPR systems might allow amending a challenged patent.

II. STRUCTURES OF EXISTING POST-ISSUANCE PATENT REVIEW SYSTEMS IN THE UNITED STATES AND EUROPE

Europe and the United States have distinct procedural systems for post-issuance review of patent validity. This Part explores the structure of each. Section II.A introduces the vehicles for patent validity review in the United States—namely, litigation and the administrative procedures available under the America Invents Act. Section II.B introduces the systems operative in Europe—namely, piecemeal litigation under the substantive law of each member state, as well as opposition proceedings before the European Patent Office (EPO).

A. *The United States*

The validity of patents issued in the United States can be contested in both litigation and administrative proceedings.

Litigation is not ideal for fighting patent trolls. Faced with a bad patent, an accused infringer can seek a declaratory judgment of invalidity or argue an invalidity defense.²³ But patent trial costs are especially high, which,

<https://patentlyo.com/patent/2016/07/partes-review-statistics.html> (surveying patent invalidation rates in administrative patent review procedure).

21. See, e.g., Malathi Nayak, *Cost of Patent Litigation Falling Sharply*, BLOOMBERG (Aug. 10, 2017), <https://www.bna.com/cost-patent-infringement-n73014463011/> (identifying administrative review procedure as a factor in falling cost of patent litigation in the United States).

22. Compare Mark A. Lemley, Essay, *Rational Ignorance at the Patent Office*, 95 NW. U. L. REV. 1495 (2001), with Michael Frakes & Melissa F. Wasserman, *Irrational Ignorance at the Patent Office*, 72 VAND. L. REV. (forthcoming 2019).

23. See generally 6A DONALD S. CHISUM, CHISUM ON PATENTS § 19.02 (reviewing invalidity defenses); 8 CHISUM ON PATENTS § 21.03[4] (reviewing declaratory judgment). See also 35 U.S.C. § 282(b)(2)–(3) (2012) (establishing grounds for invalidity defenses). A patent owner is precluded from asserting later a patent found invalid at trial. *Blonder-Tongue Labs., Inc. v. Univ. of Ill. Found.*, 402 U.S. 313, 349–50 (1971).

coupled with high ex ante uncertainty surrounding patent validity, incentivizes settlement even if the asserted patent is improper.²⁴

Under the AIA, several administrative PIPR proceedings are newly available to cancel or amend a bad patent.²⁵ These include several largely similar proceedings: inter partes review (IPR), covered business method review (CBMR), and post-grant review (PGR).²⁶ These are all adversarial procedures before an administrative tribunal, the Patent Trial and Appeal Board (PTAB). Each varies—for instance, PGR is available for only nine months after a patent issues, but the patent can be challenged on any ground.²⁷ IPR is available at almost any time,²⁸ but the grounds of challenge are restricted.²⁹ CBMR allows a challenge on any ground but is restricted to a narrow subset of subject-matter and is available only to parties that have been sued for infringement.³⁰

Administrative PIPR procedures in the United States suffer from several perceived drawbacks. For one, their constitutional legitimacy is still being explored—the general constitutionality of such administrative determinations of property rights was recently upheld, but the Supreme Court noted an open question as to the constitutionality in certain situations.³¹ Second, in some respects, the PTAB employs different legal standards than district courts do, and the estoppel effect of validity judgments or determinations of patent scope are uncertain.³² Third, while meant to be an efficiency-

24. See, e.g., James Bessen & Michael J. Maurer, *The Direct Costs from NPE Disputes*, 99 CORNELL L. REV. 387, 408 (2014) (estimating the burden of litigation by patent trolls at \$29 billion annually).

25. Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011).

26. See generally 4 DONALD S. CHISUM, CHISUM ON PATENTS § 11.07 (describing post-allowance procedures at the United States Patent and Trademark Office).

27. See 35 U.S.C. § 321.

28. There are some slight qualifications to availability for IPRs, which cannot be filed sooner than nine months following patent issuance, see *id.* § 311(c)(1), and can only be filed within twelve months of the suit if the filing party has been sued for infringement, see *id.* § 315(b).

29. See *id.* § 311.

30. See 37 C.F.R. § 42.302(a) (2017) (establishing that a CBMR petition may only be filed by a party sued for infringement); *id.* § 42.303 (CBMR available any time after PGR); *id.* § 42.304 (establishing substantive grounds for challenge).

31. See *Oil States Energy Servs., LLC v. Greene's Energy Grp., LLC*, 138 S. Ct. 1365 (2018). The Court held that, under the public-rights doctrine, inter partes review by the USPTO does not violate Article III of the U.S. Constitution. *Id.* at 1373; see also *id.* at 1379 (“[W]e address only the precise constitutional challenges that Oil States raised here. Oil States does not challenge the retroactive application of inter partes review, even though that procedure was not in place when its patent issued.”).

32. For instance, up until a November 2018 rule change, the PTAB and district courts used slightly different standards in interpreting patent scope. *PTAB Issues Claim Construction Final Rule*, USPTO, <https://www.uspto.gov/patents-application-process/patent-trial-and-appeal-board/procedures/ptab-issues-claim-construction> (last visited Nov. 13, 2018). The relationship between the PTAB and district courts vis-à-vis issue preclusion is still unsettled. See

enhancing substitute for litigation, administrative PIPR has become a routine addendum to litigation.³³ Fourth, there is some contention that the relaxed procedural requirements and legal standards have resulted in a system that is *too* aggressive in finding patents invalid and has given rise to “reverse trolling”—that is, using PIPR to extort settlements from patent owners.³⁴

B. Europe

Post-issuance review of patents in Europe is more complex due to the coexistence of multiple patent law systems, including individual national bodies of patent law and several international agreements, most prominently the European Patent Convention (EPC).³⁵ An inventor may procure a patent (1) through examination by an individual national patent office, submitted directly in each nation in which protection is desired, yielding “national patents”; or (2) through a single application before the EPO followed by individual validation in applicant-designated EPC signatory countries, yielding “European patents.”³⁶ But despite a centralized examination process, a “European patent” under the EPC is really just a bundle of national patents.

There is one EPC-wide post-issuance review system, but it is very narrow. Patents issued through the EPO are subject to challenge for nine months after issuance through the opposition procedure.³⁷ Opposition is adversarial and administrative;³⁸ any person may file an opposition.³⁹ The grounds on which a patent may be challenged in an opposition are limited to

Jonathan I. Tietz, *The “Broadest Reasonable Interpretation” and Applying Issue Preclusion to Administrative Patent Claim Construction*, 117 MICH. L. REV. 349 (2018).

33. It is becoming common practice to file petitions for inter partes review of asserted patents as part of a general litigation defense strategy. See, e.g., Matt Cutler, *Inter Partes Review—Not Just an Anti-Troll Proceeding*, LAW360 (July 21, 2015), <https://www.law360.com/articles/679716/inter-partes-review-not-just-an-anti-troll-proceeding> (describing such strategy).

34. See Erik Hovenkamp & Jorge Lemus, *Delayed Entry Settlements at the Patent Office*, 54 INT’L REV. L. & ECON. 30 (2018).

35. Convention on the Grant of European Patents of 5 October 1973 (European Patent Convention), <http://www.epo.org/patents/law/legal-texts/epc.html> [hereinafter EPC]. The membership of the EPC includes all Member States of the European Union as well as several non-EU countries. Joseph Kenneth Yarsky, Note, *Hastening Harmonization in European Union Patent Law Through a Preliminary Reference Power*, 40 B.C. INT’L & COMP. L. REV. 167, 173 (2017).

36. EPC, *supra* note 35, art. 65(1) (“Any Contracting State may . . . prescribe that the proprietor of the patent shall supply to its central industrial property office a translation of the patent . . . in one of its official languages . . .”).

37. *Id.* art. 99. The grounds of patentability are limited to EPC articles 52–57—essentially, subject matter, novelty, inventive step, and industrial application. See also *Oppositions*, EUR. PATENT OFFICE (last updated Oct. 4, 2017), <https://www.epo.org/applying/european/oppositions.html>.

38. EPC, *supra* note 35, art. 99.

39. *Id.* art. 99(3).

patentability (including subject matter, novelty, inventive step), incomplete disclosure, and improper support for amendments.⁴⁰

Beyond the nine-month window for bringing an opposition, the EPC allows for limitation (i.e., amendment) or revocation (i.e., invalidation) of a European patent before the EPO, which, if successful, are effective in all applicable countries.⁴¹ But only a patent owner can seek limitation or revocation.⁴² Hence, this is not an effective anti-troll PIPR vehicle but simply a low-risk way for a patent owner to proactively narrow the scope of a questionable patent.

Thus, given the limits of EPO opposition, limitation, and revocation proceedings, the main way to conduct PIPR of a bad patent in Europe is country-by-country litigation. Despite some harmonization of substantive patent law across Europe,⁴³ however, litigation procedures vary in ways that can affect troll behavior.

There is variation across the European Union as to *who* is entitled to request review of validity of a patent. France, for instance, has strict requirements that a party seeking invalidity must possess “sufficient interest to free the patented technique from any patent protection and demonstrate that the patent is an actual threat to its economic activity.”⁴⁴ In contrast, German law permits any party to bring an action for invalidity,⁴⁵ as does the law of the United Kingdom.⁴⁶ In general, invalidity actions are permissive; only a handful of European Union member states appear to have meaningful standing requirements.⁴⁷ There is also variation as to whether infringement and

40. *Id.* art. 100.

41. *Id.* art. 105a.

42. *Id.* art. 105a(1).

43. *See* Yarsky, *supra* note 35, at 168–73 (recounting the history of patent law harmonization efforts in Europe, including the European Patent Convention in 1977).

44. *See* Thomas Bouvet & Isabelle Bertaux, *French Court Rules on Patent Revocation Interest to Sue, Statutes of Limitation*, JONES DAY (July 19, 2017), <http://www.jonesday.com/french-court-rules-on-patent-revocation-interest-to-sue-statutes-of-limitation-07-19-2017/>.

45. *See* EUROPEAN PATENT ACADEMY, PATENT LITIGATION IN EUROPE 33–34 (4th ed. 2016), <https://www.epo.org/learning-events/materials/litigation.html> [hereinafter PATENT LITIGATION IN EUROPE].

46. *See id.* at 52.

47. Sweden, for example, allows any person who has suffered damage or a government-designated authority to bring such an action. *See id.* at 117. Finland limits availability to a “person who suffers prejudice on account of the patent” but also allows “a public authority appointed by the government for reasons of public interest.” *Id.* at 45. A few nations, including Slovenia, provide that “any interested party” may bring an invalidity action. *Id.* at 121. The phrasing in the laws of Greece, Hungary, Italy, Lithuania, and Portugal are similar. *See generally id.* In general, however, most countries allow any party to bring such an action through *some* procedure, whether administrative or judicial. *See generally id.* This is because invalidity review is often left to administrative agencies. *Id.*; *see also* Mark A. Lemley, *Why Do Juries Decide if Patents Are Valid?*, 90 VA. L. REV. 1673, 1732 (2013) (observing that “in many other countries, like Germany, validity and infringement are entirely separate, with the courts resolving only infringement and leaving validity review to the technical boards of appeal within the patent office”) [hereinafter Lemley, *Why Do Juries Decide?*].

validity issues are tried together (as in the United Kingdom) or separately (i.e., “bifurcation,” as in Germany).⁴⁸

Substantive law differs too. The interpretation of each ground on which a patent may be revoked is a matter of national law.⁴⁹ For instance, in comparing two otherwise identical patents with the same prior art, the laws of one country might interpret certain terminology differently than another country. Or these laws might evaluate different factors in judicial tests for novelty or obviousness, leading to a nation-by-nation patchwork of validity.

Accordingly, a party seeking to subject a bad patent to PIPR must do so in individual countries with variations in substantive and procedural law—heightening both economic and legal uncertainty *ex ante*.⁵⁰ There exists no international PIPR option in Europe. The anticipated UPC system, however, will change this, as discussed next.

III. THE EUROPEAN UNION’S UNIFIED PATENT COURT (UPC)

This Part examines the structure of post-issuance patent review under the European Union’s unitary patent system. Section III.A briefly reviews the status of the Unified Patent Court (UPC). Section III.B describes its general structure. Section III.C concentrates on the aspects of the UPC relevant to PIPR.

48. See Katrin Cremers et al., *Invalid but Infringed? An Analysis of the Bifurcated Patent Litigation System*, 131 J. ECON. BEHAVIOR & ORGANIZATION 218, 219, 240–41 (2014) (finding that whether or not a system is bifurcated affects the likelihood of challenge of validity and likelihood of settlement). This has implications for the effectiveness of PIPR—first, remedies may become prematurely available to a patent troll if an infringement proceeding is resolved before a validity proceeding; and second, in a bifurcated action the owner of a bad patent is free to pursue a broad interpretation of the patent’s scope in an infringement proceeding while pursuing a narrower interpretation during review of validity, undermining the usefulness of an invalidity action as a means of PIPR. See Lemley, *Why Do Juries Decide?*, *supra* note 47, at 1732 (noting that “bifurcation [] raises the risk that a patent claim will be treated ‘like a nose of wax which may be turned and twisted in any direction,’ with both parties urging inconsistent positions before different tribunals depending on whether the issue is validity or infringement”).

49. See EPC, *supra* note 35, art. 2(2) (“The European patent shall, in each of the Contracting States for which it is granted, have the effect of and be subject to the same conditions as a national patent granted by that State, unless this Convention provides otherwise.”); *id.* art. 74 (“Unless this Convention provides otherwise, the European patent application as an object of property shall, in each designated Contracting State and with effect for such State, be subject to the law applicable in that State to national patent applications.”).

50. See, e.g., Yarsky, *supra* note 35, at 170 (“The authority of national courts to hear cases of validity and infringement leads to inconsistent results among states and uncertainty when an inventor seeks to protect her intellectual property rights.”).

A. *The Status of the UPC*

A new unitary patent system is the subject of an agreement (the UPCA) between most of the EU Member States.⁵¹ The UPCA establishes the UPC, which has competence over European patents and “unitary patents.”⁵² Unlike European patents, unitary patents are essentially single European Union-wide intellectual property rights.⁵³ The preamble to the UPCA lists as a foundational goal enhancing the revocation of improper patents.⁵⁴ Additionally, the Commission has opined that the UPC will not be amenable to patent troll behavior.⁵⁵

The signatory states (twenty-five European Union member states, excluding Croatia, Poland, and Spain) signed the UPCA on February 19, 2013.⁵⁶ This followed in the wake of two enabling “enhanced cooperation” regulations that authorized unitary patents.⁵⁷ Sixteen states have now ratified the UPCA,⁵⁸ and the EPO expects that the UPC will begin operating in the first half of 2019.⁵⁹

51. Agreement on a Unified Patent Court, 2013 O.J. (C 175) 1 [hereinafter UPCA]; *About the UPC*, UNIFIED PATENT COURT, <https://www.unified-patent-court.org/> (last visited May 7, 2019).

52. *Id.* at 2–3. Unitary patents are also known as “European patents with unitary effect,” or EPUEs. *See id.* art. 2(f).

53. With the exception of a few Member States not a party to the UPCA.

54. UPCA, *supra* note 51, at 1 (“WISHING to improve the enforcement of patents and the defense against unfounded claims and patents which should be revoked and to enhance legal certainty by setting up a Unified Patent Court for litigation relating to the infringement and validity of patents;”).

55. *See Written Question by Members of the European Parliament and their Answers Given by a European Union Institution*, 2014 O.J. (C 221) 307 (“The Commission fails to see how the recent Union legislation on patents, namely Regulations 1257/2012 and 1260/2012, could increase the activity of so called ‘patent trolls’ in Europe. . . . The UPC Agreement provides for safeguards against ‘patent trolls’. . . . The objective is to ensure that the patent validity is dealt with before the infringement action can proceed.”).

56. PATENT LITIGATION IN EUROPE, *supra* note 45, at 135; *Establishment of the Unified Patent Court (UPC)*, HERBERT SMITH FREEHILLS (Apr. 30, 2018), <https://www.herbertsmithfreehills.com/latest-thinking/unified-patent-court-agreement-including-signatories-and-ratification>.

57. Regulation 1257/2012 of the European Parliament and of the Council of 17 December 2012, Implementing Enhanced Cooperation in the Area of the Creation of Unitary Patent Protection, 2012 O.J. (L 361); Council Regulation 1260/2012, Implementing Enhanced Cooperation in the Area of the Creation of Unitary Patent Protection with Regard to the Applicable Translation Arrangements, 2012 O.J. (L 361) 89; *see also* Markus B. Boelling & Thomas Koerfer, *Unitary Patent Protection in Europe—An Attunement on the Upcoming New System*, 42 AIPLA Q.J. 493, 497–501 (2014) (discussing these regulations).

58. *See Agreement on a Unified Patent Court (UPC) – Ratification Details*, GENERAL SECRETARIAT OF THE COUNCIL, <http://www.consilium.europa.eu/en/documents-publications/treaties-agreements/agreement/?id=2013001> (last visited Sept. 28, 2018).

59. *When Will the Unitary Patent System Start?*, EUR. PATENT OFFICE, <https://www.epo.org/law-practice/unitary/unitary-patent/start.html> (last visited Sept. 28, 2018).

The UPC's legality has been questioned, but the Court of Justice has so far found it to be compatible with European Union law. Namely, Spain in 2013 unsuccessfully challenged the two unitary-patent regulations on grounds of lack of judicial review, impermissible delegation, and discrimination on the basis of language.⁶⁰ Recently, a complainant in Germany has challenged the country's own implementing legislation, delaying the UPCA's formal ratification.⁶¹ Because the complaint alleges incompatibility of the UPC with European Union law, it is likely that the German constitutional court will refer at least one question to the Court of Justice, further delaying implementation,⁶² although the court might consider the question to have been already answered under the *acte clair* doctrine, considering

60. In Case C-146/13, *Spain v. European Parliament*, 2015 WL Celex No. 613CJ0146, Spain challenged Regulation 1257/2012 (implementing enhanced cooperation in the area of the creation of unitary patent protection) on the grounds of "infringement of the values of the rule of law," a "lack of legal basis," a "misuse of powers," "infringement of Article 291(2) TFEU and . . . *Meroni v High Authority*," "infringement of those principles owing to the delegation to the EPO of certain administrative tasks relating to the EPUE," and "infringement of the principles of autonomy and uniform application of EU law." *Id.* ¶ 23. Spain had argued principally that the Unitary Patent system was not subject to judicial review, threatening the uniform application of Union law and the protection of fundamental rights. *Id.* ¶ 24. Spain objected also to the procedures under which fees were set and argued that the EU had impermissibly delegated power contrary to the *Meroni* doctrine. The Court pointed out that the EU is not a party to the European Patent Convention or the UPCA, *id.* ¶¶ 82, 85, that the procedure for granting European patents had not been incorporated into EU law, *id.* ¶ 30, that the Court does not have jurisdiction to rule on the lawfulness of an international agreement concluded by the member states, *id.* ¶ 101, and that the EU itself had not delegated any exclusive power, *id.* ¶ 87.

The challenge under Case C-147/13, *Spain v. Council*, 2015 WL Celex No. 613CJ0147 (concerning the translation arrangements) was similar. There, Spain mainly alleged infringement of the principle of non-discrimination on the ground of language, given certain language restrictions at the UPC. *Id.* ¶¶ 22–25. The Court found, however, that such language discrimination was justified—satisfying proportionality analysis—by the legitimate objective of creation of a uniform and simple translation regime so as to facilitate access to patent protection by making the patent system simpler, less costly, and legally more secure. *Id.* ¶¶ 31–48.

61. A decision has not been reached, and few case details are public. See Thosten Bausch, *UPC – Finally some News from the German Federal Constitutional Court*, KLUWER PATENT BLOG (Aug. 16, 2017), <http://patentblog.kluweriplaw.com/2017/08/16/upc-finally-some-news-from-the-german-federal-constitutional-court/>; Richard Pinckney, *Complainant in UPC German Constitutional Challenge Publishes Update*, BRISTOWS UPC (Mar. 7, 2018), <https://www.bristowsupc.com/latest-news/complainant-in-upc-german-constitutional-challenge-publishes-update/>. But in an interesting parallel to common criticisms of administrative post-issuance patent review (e.g., IPR) in the United States, the challenge includes allegations of insufficient procedural safeguards and a lack of judicial independence in the UPC system. See Alexander Klicznik & Lukas Sievers, *UPC and Germany: Status Update - Constitutional Complaint, Ratification Timeline and More*, LEXOLOGY (Oct. 17, 2017), <https://www.lexology.com/library/detail.aspx?g=bfe0c73a-8b0e-4e37-9efd-f1407e3e9a92>.

62. See European Patent Institute, *What We Know About the Status of the Unitary Patent and Unified Patent Court Project in Mid September 2017*, EPI INFORMATION (Sept. 2017), <https://information.patentepi.com/issue-3-2017/what-we-know-about-the-status-of-the-unitary-patent-and-unified-patent-court-project-in-mid-september-2017.html>.

Spain's litigation.⁶³ This and Brexit⁶⁴ stand as the last roadblocks to implementation.

B. *General Structure of the UPC*

The UPC is an international legal system resembling a specialized hybrid of a patent agency and a court.

The UPC "shall be a court common to the Contracting Member States and thus subject to the same obligations under Union law as any national court of the Contracting Member States."⁶⁵ The UPC draws from European Union law, among other sources, although it is not a European Union body.⁶⁶ Several specific sources of law are explicitly applicable, namely European Union law, including the two enhanced-cooperation regulations;⁶⁷ the UPCA itself; the EPC; applicable international agreements; and national law in certain circumstances.⁶⁸ The contractual and noncontractual liability of the UPCA is expressly governed not only by contracting member state law but also by European Union regulations.⁶⁹ Indeed, Article 20 declares that "[t]he Court shall apply Union law in its entirety and shall respect its primacy,"⁷⁰ and the UPC is bound by decisions of the Court of Justice.⁷¹

The UPCA establishes a centralized system not only for patent examination but also for litigation, hearing claims and counterclaims for infringement and validity (under the UPCA, "revocation").⁷² The court comprises a Court of First Instance (CFI) (with central, regional, and local divisions) and a Court of Appeal.⁷³

63. See *supra* note 60.

64. See PATENT LITIGATION IN EUROPE, *supra* note 45, at 135.

65. UPCA, *supra* note 51, art. 1; see also *id.* art. 4(1) ("The Court shall have legal personality in each Contracting Member State and shall enjoy the most extensive legal capacity accorded to legal persons under the national law of that State.").

66. *Id.* art. 24. Although the unitary patent is affirmatively authorized by the European Patent Convention (EPC), see EPC, *supra* note 35, art. 142, Unified Patent Court and the unitary patent system are available only to European Union member states and not to non-EU EPC signatories. See Boelling & Koerfer, *supra* note 57, at 497.

67. Regulation 1257/2012 of the European Parliament and of the Council of 17 December 2012, Implementing Enhanced Cooperation in the Area of the Creation of Unitary Patent Protection, 2012 O.J. (L 361); Council Regulation 1260/2012, Implementing Enhanced Cooperation in the Area of the Creation of Unitary Patent Protection with Regard to the Applicable Translation Arrangements, 2012 O.J. (L 361) 89.

68. UPCA, *supra* note 51, art. 24.

69. See *id.* art. 5.

70. *Id.* art. 20.

71. *Id.* art. 21.

72. *Id.* arts. 32, 65.

73. *Id.* arts. 6(1), 7(1). The central division is to be seated in Paris, with sections also in London and Munich. *Id.* art. 7(2). The continued presence of the London section is especially intriguing in light of Brexit. Regional divisions are to be established for groups of Contracting States, whereas local divisions are specific to individual Contracting States. *Id.* arts. 7(3)–(5).

In general, the judicial panels of the CFI resemble those of an ordinary, if specialized, court. The UPCA establishes two categories of judges: legally qualified and technically qualified.⁷⁴ Members of the former are required to “possess the qualifications required for appointment to judicial offices in a Contracting Member State”; the latter must have “a university degree and proven expertise in a field of technology” and have “proven knowledge of civil law and procedure relevant in patent litigation.”⁷⁵ Both must have “proven experience in the field of patent litigation.”⁷⁶

By default, panels of the local and regional divisions are obligatorily multinational⁷⁷ and entirely comprise legally qualified judges.⁷⁸ Panels may request allocation of one technically qualified judge *sua sponte* or at the request of a party.⁷⁹ Additionally, where patent validity is in question—revocation actions or counterclaims—a technically qualified judge is typically required.⁸⁰ Panels of the central division, which has exclusive jurisdiction over stand-alone revocation claims, consist of two legally qualified and one technically qualified judge.⁸¹ Panels of the Court of Appeal are also multinational and comprise five judges: three legally qualified and two technically qualified.⁸²

Thus, although for infringement claims it resembles an ordinary, if specialized, court, for revocation claims (where the questions at hand are particularly technical) the UPC begins to resemble a specialized administrative body.⁸³

C. Post-Issuance Patent Review under the UPCA

The vehicle for post-issuance error-checking under the UPCA is the revocation action, which may be brought either for unitary or European pa-

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

75. *Id.* arts. 15(2), 15(3).

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

77. *Id.* art. 8(1).

78. *Id.* arts. 8(3), 8(4).

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

80. *Id.* art. 33(3)(a). Parties may, alternatively, simply agree to be heard by a single legally qualified judge in lieu of such a panel. *Id.* art. 8(7).

81. *Id.* art. 8(6).

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

83. Compare, for instance, to the United States: in patent litigation, neither the judge nor any of the litigating attorneys need have any meaningful technical qualifications; in administrative review proceedings before the Patent Trial and Appeal Board, however, the judges are usually technically qualified (often with work experience or graduate education), and the attorneys must be admitted to practice before the USPTO—that is, having passed a patent-specific registration exam and possessing certain technical education qualifications. See Saurabh Vishnubhakat et al., *Strategic Decision Making in Dual PTAB and District Court Proceedings*, 31 BERKELEY TECH. L.J. 45, 52–54 (2016) (comparing district court judges and administrative patent judges and the contribution of the difference to forum-shopping in district courts).

tents.⁸⁴ The UPC has a limited period of concurrent jurisdiction with national courts for review of European patents⁸⁵ but has exclusive jurisdiction over unitary patents.⁸⁶ The UPC has no jurisdiction over national patents.

Grounds for revocation are expressly enumerated and include subject matter, novelty, inventive step, definiteness, industrial application, adequate disclosure, among others.⁸⁷ This essentially equates the standards for revocation actions and patent examination.

The UPCA imparts no timing requirement for revocation actions,⁸⁸ in contrast to the EPO's nine-month window for oppositions⁸⁹ and the UPCA's five-year limitations period for monetary-damages actions.⁹⁰

Importantly, a revocation action is not a binary, valid-or-invalid inquiry. Rather, the UPCA imparts a patent *limitation* requirement in revocation proceedings.⁹¹ If only a part of a patent is deemed invalid, the patent is modified accordingly by amendment rather than being struck down entirely. This Article 65(3) requirement is couched as a mandate upon the court,⁹² and it is nearly identical to its counterpart in the EPC concerning revocation actions at the EPO.⁹³ These requirements cooperate with EPC Article 138(3), which gives patent owners the *right* to limit by amendment a patent whose validity is before a competent authority.⁹⁴

The forum for a revocation action is limited. UPCA Article 33 establishes the competence of the Court of First Instance (CFI),⁹⁵ in which stand-alone revocation actions are limited to the central division.⁹⁶ If a parallel infringement proceeding is pending, the revocation action is to be brought in

84. UPCA, *supra* note 51, art. 32(1)(d).

85. *Id.* art. 83(1) (establishing seven-year transitional period of concurrent jurisdiction).

86. *Id.* art. 32(1).

87. *Id.* art. 65(2). These are defined by reference to the EPC and are equivalent to the patentability grounds described therein.

88. *Id.* art. 32(1)(d), (e).

89. EPC, *supra* note 35, art. 99(1).

90. UPCA, *supra* note 51, art. 72 (“[A]ctions relating to all forms of financial compensation may not be brought more than five years after the date on which the applicant became aware, or had reasonable grounds to become aware, of the last fact justifying the action.”).

91. *Id.* art. 65(3).

92. *Id.* art. 65(3) (“Without prejudice to Article 138(3) of the EPC, if the grounds for revocation affect the patent only in part, *the patent shall be limited by a corresponding amendment* of the claims and revoked in part.” (emphasis added)).

93. EPC, *supra* note 35, art. 138(2) (“If the grounds for revocation affect the European patent only in part, *the patent shall be limited by a corresponding amendment* of the claims and revoked in part.” (emphasis added)).

94. *Id.* art. 138(3) (“In proceedings before the competent court or authority relating to the validity of the European patent, the proprietor of the patent shall have the right to limit the patent by amending the claims. The patent as thus limited shall form the basis for the proceedings.”).

95. UPCA, *supra* note 51, art. 33.

96. *Id.* art. 33(4).

the same local or regional division;⁹⁷ this is true also of revocation counterclaims.⁹⁸ A local or regional division, however, has the discretion to refer the revocation to the central division.⁹⁹ Where a local or regional division keeps the revocation action, it must also request allocation of a technically qualified judge from a centralized pool.¹⁰⁰ This transforms the panel into one resembling the central division.

The UPCA authorizes not only revocation counterclaims but direct revocation actions themselves.¹⁰¹ Curiously, it is unclear exactly who is entitled to bring such an action. Article 47(6) provides:¹⁰²

Any other natural or legal person, or any body entitled to bring actions in accordance with its national law, who is concerned by a patent, may bring actions in accordance with the Rules of Procedure.

The meaning of “who is concerned by a patent”¹⁰³ is not clear, but comparison to the phrasing of the rules for opposition before the EPO suggests that it is perhaps stricter than the EPO’s “any person”¹⁰⁴—especially because other language in the UPCA was seemingly directly imported from the EPC. The EPC provides:¹⁰⁵

Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, *any person* may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. . . .

The Draft Rules of Procedure for the UPC do not directly address standing.¹⁰⁶ Despite the phrase “who is concerned by a patent” in Article

97. *Id.*

98. *Id.* art. 33(3).

99. *Id.*

100. *Id.* art. 33(3)(a).

101. *Id.* art. 32(1)(d) (establishing competence for revocation actions).

102. *Id.* art. 47(6) (emphasis added).

103. The German version of the UPCA uses the word “betroffen”:

(6) Jede andere natürliche oder juristische Person oder jede Vereinigung, die von einem Patent betroffen und nach dem für sie geltenden nationalen Recht berechtigt ist, Klage zu erheben, kann nach Maßgabe der Verfahrensordnung Klage erheben.

The French uses “concerné”:

6. Toute autre personne physique ou morale, ou tout organisme habilité à engager une action conformément à son droit national, qui est concerné par un brevet, peut engager une action conformément au règlement de procédure.

See 2013 O.J. EPO 287, 319, http://archive.epo.org/epo/pubs/oj013/05_13/05_2873.pdf.

104. EPC, *supra* note 35, art. 99(1).

105. *Id.* (emphasis added).

106. See generally Preliminary Set of Provisions for the Rules of Procedure of the Unified Patent Court, 18th Draft of Oct. 19, 2015 (Mar. 15, 2017), <https://www.unified-patent->

47(6)—hinting at a requirement of economic or legal interest—the requirements for a “statement for revocation” in the Draft Rules include no requirement of a statement of concern or a demonstration of interest.¹⁰⁷ In contrast, for patent *infringement*, the Rules affirmatively require filing evidence that the claimant, if not the patent owner, is “entitled to commence proceedings.”¹⁰⁸ A similar requirement is found for a declaration of non-infringement.¹⁰⁹

Other European Union law does not clearly resolve the issue. The Unitary Patent Regulation (UPR) includes some provisions detailing when national law applies. Article 7, for instance, specifies which national law applies to a given unitary patent based on the applicant’s residency or business, treating the patent as an object of property in that jurisdiction.¹¹⁰ Article 5(3), in turn, seems to base the scope of protection and limitations on the national law designated by Article 7.¹¹¹ As noted, individual countries differ in who is permitted to bring a revocation action under national law,¹¹² and so if national law is the determinant of who may bring a revocation action at the UPC, a patchwork will result, in tension with Article 5(2)’s emphasis on uniform scope.¹¹³ Indeed, under the UPCA, revocation is largely

court.org/sites/default/files/upc_rules_of_procedure_18th_draft_15_march_2017_final_clear.pdf [hereinafter Draft Rules of Procedure].

107. See *id.* r. 44.

108. See *id.* r. 13.1(f) (requiring when stating an infringement claim “where the claimant is not the proprietor of the patent concerned, or not the only proprietor, evidence to show the claimant is entitled to commence proceedings”). Rule 13.1 contains a number of other pleading requirements. Rule 44, which governs pleading of revocation actions, includes some of the Rule 13.1 requirements, but conspicuously omits 13.1(f). See *id.* r. 44.

109. See *id.* r. 63(a) (requiring the particulars of Rule 13.1, including evidence to show the claimant is entitled to commence proceedings).

110. Regulation 1257/2012 of the European Parliament and of the Council of 17 December 2012, Implementing Enhanced Cooperation in the Area of the Creation of Unitary Patent Protection, 2012 O.J. (L 361) 5, art. 7(1) [hereinafter Unitary Patent Regulation] (“A European patent with unitary effect as an object of property shall be treated in its entirety and in all the participating Member States as a national patent of the participating Member State in which that patent has unitary effect and in which, according to the European Patent Register . . . the applicant had his residence or principal place of business . . . or [] where . . . the applicant had a place of business on the date of filing.”); see also *id.* art. 7(3) (providing that German national law applies if an applicant has no residence or business in a Contracting State).

111. See *id.* art. 5(3) (“The acts against which the patent provides protection referred to in paragraph 1 and the applicable limitations shall be those defined by the law applied to European patents with unitary effect in the participating Member State whose national law is applicable to the European patent with unitary effect as an object of property in accordance with Article 7.”). Article 5(3) might, instead, be narrow—it specifies that the applicable law is “the law applied to European patents with unitary effect in the participating Member State whose national law is applicable,” which seems to suggest law implementing the unitary patent system. See *id.*

112. See *supra* text accompanying notes 44–48.

113. See Unitary Patent Regulation, *supra* note 111, art. 5(2) (emphasizing that “[t]he scope of [the unitary patent] right and its limitations shall be uniform in all participating

centralized, suggesting that national law should *not* apply in this respect, so as not to undermine the effectiveness of such centralization. Further, the UPC's structure resembles the German patent system, German law applies when no particular national law clearly applies,¹¹⁴ and under German law, any party may bring revocation. Thus, it is probably appropriate to read Article 7 as regarding substantive, not procedural, patent law—there only to fill gaps in the UPCA.¹¹⁵

The “concerned by” language of Article 47 evokes the concepts of direct and individual concern in European Union law.¹¹⁶ Given that European Union law has primacy under the UPCA, these concepts might be imported.¹¹⁷ If so, however, it is still puzzling that the Draft Rules of Procedure for the UPC contain requirements for detailed pleading of grounds of unpatentability in a revocation action but no requirement of a statement of concern.

Article 42 also imposes proportionality and fairness requirements.¹¹⁸ Perhaps allowing *any* party—regardless of economic or legal interest—to bring a revocation action at any time in the lifetime of a patent might run afoul of fairness, as property stands to be taken away.¹¹⁹ Consider Article 69, which establishes that the losing party in an action before the UPC will bear the legal costs of the winner.¹²⁰ If any party, regardless of legal or eco-

Member States in which the patent has unitary effect”). On the other hand, these “rights and limitations” are likely those outlined in UPCA arts. 25–30, delineating the rights of a patent owner to exclude others from practicing an invention and providing limitations on who the patent owner may exclude. *See* UPCA *supra* note 52, arts. 25–30. These provisions do not address the separate issue of what the scope of the technology covered by the patent—and the conditions of its issuance—are. *See id.*

114. *See* Case C-146/13, Spain v. European Parliament, 2015 WL Celex No. 613CJ0146, ¶ 16.

115. For example, questions of patent claim term interpretation, findings of facts, and the like.

116. *See, e.g.*, Consolidated Version of the Treaty on the Functioning of the European Union art. 263, Oct. 26, 2012, 2012 O.J. (C 326) 162 [hereinafter TFEU] (“Any natural or legal person may, under the conditions laid down in the first and second paragraphs, institute proceedings against an act addressed to that person or which is of direct and individual concern to them, and against a regulatory act which is of direct concern to them and does not entail implementing measures.”).

117. *See* UPCA, *supra* note 51, art. 20 (“The Court shall apply Union law in its entirety and shall respect its primacy.”).

118. *Id.* art. 42.

119. *See, e.g.*, Anje Lunze & Jan Phillip Rektorschek, *Can You Afford to Litigate in the Unified Patent Court?*, MANAGING IP (Aug. 25, 2015), <http://www.managingip.com/Article/3480083/Can-you-afford-to-litigate-in-the-Unified-Patent-Court.html>, also available at <https://deutschland.taylorwessing.com/documents/get/194/can-you-afford-to-litigate-in-the-upc.pdf> (warning potential patent clients of the risk of exposure to legal fees via revocation filings by third parties).

120. UPCA, *supra* note 51, art. 69(1) (“Reasonable and proportionate legal costs and other expenses incurred by the successful party shall, as a general rule, be borne by the unsuccessful party, unless equity requires otherwise, up to a ceiling set in accordance with the Rules of Procedure.”).

nomomic interest, may institute a revocation action, this may be unfair under Article 42 (especially if a patent owner never intended to assert its patent).¹²¹ On the other hand, the UPC might decline to fee-shift in such a situation under the equitable exception in Article 69.¹²²

The European Patent Convention—from which much of UPC law is imported—does not clarify. The EPC delineates its impact on national law but has no provision describing standing.¹²³

There is another way to read Article 47(6): the phrase “who is concerned by a patent” might be read to modify only the phrase “any body entitled to bring actions in accordance with . . . national law.”¹²⁴ In that case, “concerned by a patent” seems to impose a requirement that governmental bodies (as opposed to individuals and private juridical entities) who bring revocation actions have some relation to patent law.¹²⁵ For example, a designated public prosecutor (or perhaps an official acting on behalf of a country’s patent office) who deals with patents could bring a revocation action on behalf of the government, but a local magistrate could not. This would be consistent with the current practices of certain UPCA signatories—for example, Finland, Italy, and Sweden.¹²⁶ This also appears to be consistent with the grammatical structure of the German version of Article 47(6).¹²⁷

Thus, the exact threshold for revocation standing seems unclear, but, given that revocation is intended to be a centralized procedure surrounding a

121. See *id.* art. 42.

122. *Id.* art. 69.

123. EPC, *supra* note 35, art. 138.

124. UPCA, *supra* note 51, art. 47(6) (“Any other natural or legal person, or any body entitled to bring actions in accordance with its national law, who is concerned by a patent, may bring actions in accordance with the Rules of Procedure.” (emphasis added)).

But it is unclear under this reading why Article 47(6) was not worded as clearly as Article 47(7):

Any natural or legal person, or any body entitled to bring actions in accordance with its national law and who is affected by a decision of the European Patent . . . entitled to bring actions under Article 32(1)(i).

UPCA, *supra* note 51, art. 47(7) (emphasis added).

125. For example, regarding a patent, the patent office is the agency concerned—not the post office.

126. See PATENT LITIGATION IN EUROPE, *supra* note 45, at 45, 71, 117. Sweden allows an action by “a public authority designated by the government.” *Id.* at 117. Italy allows an action by “a public prosecutor.” *Id.* at 71. Finland permits actions by “a public authority appointed by the government for reasons of public interest.” *Id.* at 45.

127. See *supra* note 103 (“Jede andere natürliche oder juristische Person oder jede Vereinigung, die von einem Patent betroffen und nach dem für sie geltenden nationalen Recht berechtigt ist, Klage zu erheben, kann nach Maßgabe der Verfahrensordnung Klage erheben.” (emphasis added)). The phrase “die . . . berechtigt ist,” which includes the interest requirement and the national authorization requirement, seems to modify “jede Vereinigung.” The translation would then be: “Any other natural or legal person or any association concerned by a patent and entitled to bring an action under its national law may bring an action in accordance with the Rules of Procedure.”

unified patent right, the requirement is likely to be uniform. Given the absence of a requirement in the Draft Rules of Procedure to demonstrate concern, the standard—if any—is likely to be modest, and perhaps only applied to governmental plaintiffs. The UPC might simply apply its principles of fairness and equity and examine whether the action is in bad faith. It is plausible that the mandatory fixed fee to bring a revocation action acts as a proxy for standing to dissuade frivolous claims and indirectly assure some economic interest.¹²⁸

IV. COMPARISON OF THE UPC AND US PIPR THROUGH THE LENS OF THE PATENT TROLL PROBLEM

On the surface, it appears that the UPC includes a much more effective anti-patent-troll PIPR mechanism than the United States does. But this depends on the weight of certain structural disincentives within the UPC. This Part compares the UPC to the United States through the lens of the patent troll problem. Section IV.A notes that, under a structural analysis, the UPC seems to be a more expansive and accessible PIPR mechanism than exists in the United States. Section IV.B considers that not every patent troll-asserted patent in Europe will be a unitary patent, and so certain structural features might dissuade patent owners from participating in the UPC at all and hence limit its effectiveness as an anti-troll procedure.

A. *The UPC Promises a Much More Expansive Post-Issuance Patent Review System*

The UPC appears to be more effective against trolls than the US system because of advantages in availability, judicial expertise, unification of standards, amendment practice, and forum limitations. In this sense, the UPC appears to be a much more vigorous PIPR system.

In many respects, the UPC resembles a structural hybrid of the US litigation and administrative PIPR systems. But more importantly, it is broader than both in overall availability—apparently, nearly any party may bring a revocation action, and at any time, and on nearly any ground of unpatentability.

Compared to administrative PIPR in the United States, the UPC revocation proceeding is generally broader and more accessible: it is available on

128. See PREPARATORY COMMITTEE FOR THE UNIFIED PATENT COURT, RULES ON COURT FEES AND RECOVERABLE COSTS 9 (Feb. 25, 2016), https://www.unified-patent-court.org/sites/default/files/agreed_and_final_r370_subject_to_legal_scrubbing_to_secretariat.pdf [hereinafter RULES ON COURT FEES].

more grounds than IPR,¹²⁹ to more parties than CBMR,¹³⁰ and for a longer time than PGR.¹³¹

Additionally, a UPC judgment is more direct than an administrative decision in the United States, where trial courts are generally not bound by PTAB decisions not yet affirmed by the Federal Circuit.¹³² The UPC also has exclusive competence on revocation actions for unitary patents—in the United States, the PTAB shares its invalidation power with district courts; thus, the UPC minimizes forum-based uncertainty in PIPR.¹³³

Indeed, the technical-judge allocation procedure of the UPC also seems to limit the effects of forum shopping by patent troll plaintiffs.¹³⁴ In the United States, by contrast, the effectiveness of PIPR can be attenuated by forum shopping by a savvy troll plaintiff.¹³⁵ The UPCA's rules that, if revocation questions arise, judges from a centralized pool are allocated to those proceedings mean that with respect to questions of patent validity, a troll plaintiff has little forum choice.¹³⁶ Additionally, the UPC's Draft Rules note that where a revocation and infringement action are being tried separately, the revocation claim is to be accelerated.¹³⁷

Additionally, amendment of a bad patent during the proceeding is mandatory where feasible.¹³⁸ Although in PIPR actions in the United States a party may, in theory, amend its own patent, the PTAB typically does not

129. See 35 U.S.C. § 311(b) (2012) (limiting IPR petitions to “only on a ground that could be raised under [statutory novelty or obviousness] and only on the basis of prior art consisting of patents or printed publications”).

130. See 37 C.F.R. § 42.302(a) (2017) (limiting CBMR petitions to parties having been “sued for infringement of the patent or . . . charged with infringement under that patent”).

131. See 35 U.S.C. § 321(c) (limiting PGR petitions to “9 months after the date of the grant of the patent”).

132. *E.g., id.* § 318(b) (establishing that the Patent Office Director only issues certificates of cancellation after both a PTAB decision and an exhaustion of any appeal); *Rembrandt Wireless Techs., LP v. Samsung Elecs. Co.*, 853 F.3d 1370, 1377 (Fed. Cir. 2017) (noting that PTAB decisions are not generally binding on district courts). This has led to situations where a patent is simultaneously (and paradoxically) held valid in one tribunal and invalid in another. See, e.g., Tietz, *supra* note 32, at 353–61.

133. With respect to unitary patents, that is, and some European patents. National patents remain in place.

134. Brian Jacobsmeyer, Note, *Forum Shopping in Patent Cases: Lessons for the Unified Patent Court*, 25 MICH. TECH. L. REV. 131, 151 (2019).

135. See J. Jonas Anderson, *Court Competition for Patent Cases*, 163 U. PA. L. REV. 631, 646–51 (2015) (noting that in the 1970s, “the odds of having a patent found to be valid could differ by over fifty percent, depending on the circuit court that ultimately reviewed the case” and observing that even since the creation of a unified circuit court with exclusive subject-matter jurisdiction over patent cases, “forum shopping persists”); see also Kimberly A. Moore, *Forum Shopping in Patent Cases: Does Geographic Choice Affect Innovation?*, 79 N.C. L. REV. 889, 921–22 (observing that “forum and timing really do matter”).

136. See *supra* text accompanying note 80.

137. See Draft Rules of Procedure, *supra* note 106, r. 40(b).

138. See *supra* text accompanying notes 91–94.

grant such motions to amend.¹³⁹ It remains to be seen whether UPC amendment practice is permissive.

Compared to litigation-based PIPR in the United States, the UPC is similar in the extent of available grounds (that is, any grounds that would have prevented the patent's issuance in the first place). But the UPC seemingly unifies the law of patent examination and review, whereas district courts in the United States operate under different burden-of-proof and claim-construction rules than the PTAB.¹⁴⁰ The relaxed standing requirement is also significant in comparing the UPC to litigation in the United States—a declaratory judgment action for patent invalidity in a US district court has a heightened standing requirement, limited to situations where the patent owner would otherwise have standing to sue the potential infringer.¹⁴¹ In comparison, the UPC bolsters the ability of firms to reduce their own economic uncertainty by bringing revocation actions before investment in potentially infringing technologies.

Additionally, in US patent litigation, judges (and juries) are generalists; the UPC, in contrast, employs judges with technical qualifications—with no juries.¹⁴² Such expertise is likely to improve the quality and accuracy of PIPR, at least compared to expert battles before US courts. In principle, then, the UPC should be more likely to get technical questions right and to accurately construe patent language.¹⁴³ Further, unlike litigation, the UPC revocation proceeding enables selective amendments of patents. Combined

139. See Tietz, *supra* note 32, at 368.

140. Anecdotally, patent examiners will often ignore citations to caselaw in patent applications and patent amendments unless the Patent Office has issued specific guidance documents.

141. See 8 DONALD S. CHISUM, CHISUM ON PATENTS § 21.03[4] (discussing standing for actions for declaratory judgment of patent invalidity). There is a generally lax standing requirement for administrative PIPR in the United States, however. This makes the administrative route more viable as a means to combat patent trolls, enabling a broad “private patent examiner” function. The actual use of IPR in the United States by parties without traditional Article III standing highlights the potential use and abuse of this “private patent examiner” function. See, e.g., Michelle Camiaux & Michael E. Sander, *Activists and Investors: A New Breed of IPR Petitioners?*, IPR BLOG (June 20, 2014), <http://interpartesreviewblog.com/activists-investors-new-breed-ipr-petitioners/> (archived at <https://web.archive.org/web/20170118134439/http://interpartesreviewblog.com/activists-investors-new-breed-ipr-petitioners/>). For instance, the non-profit Electronic Frontier Foundation has taken to filing petitions for IPR to eliminate so-called “illegitimate patents” that it has no financial interest in but sees as a threat to private citizens. *Id.* On the other hand, certain investors have filed IPRs against companies they plan to short-sell, for the purpose of tanking stock prices. *Id.*; see also Paul Barrett, *How Patent Trolls Sparked a Failed Assault on High Drug Prices*, BLOOMBERG (Apr. 10, 2017, 2:10 PM), <https://www.bloomberg.com/news/articles/2017-04-10/how-patent-trolls-sparked-a-failed-assault-on-high-drug-prices>.

142. See *supra* text accompanying notes 72–83.

143. See Lemley, *Why Do Juries Decide?*, *supra* note 47, at 1732 (“Specialization is generally desirable; the European system arguably produces more accurate evaluations of a patent’s validity than would a lay jury.”).

with judicial expertise and equitable principles, this is likely to result in more sensible decisions regarding patent validity and scope.¹⁴⁴

Compared to the United States, the UPC also benefits from a loser-pays fee regime. In the United States, administrative PIPR is seen as viable in part because it is substantially cheaper than litigation.¹⁴⁵ But the lack of a loser-pays fee system means that patent troll lawyers can operate on a lean, contingent-fee basis, while those seeking PIPR necessarily incur costs. In contrast, the UPCA establishes that the losing party at the UPC will generally bear the costs of the winner.¹⁴⁶ This reduces the financial burden on patent challengers, especially where the likelihood of success is high.

Thus, as an ex post anti-troll PIPR vehicle, UPC revocation actions seem advantageous over PIPR in the United States in terms of availability, judicial expertise, unification of standards, amendment practice, and forum limitations. On the other hand, as discussed next, certain structural factors limit the potential applicability of the UPC system to the patent troll problem.

B. *The UPC May Inadvertently Disincentivize Patent Owners from Participation*

Despite its merits, PIPR under the UPC might be too-strong medicine. As discussed in this Section, the UPC exists alongside national patent systems.¹⁴⁷ Patent owners have a choice of where to file patents. Accordingly, several features of the UPCA suggest that for patent owners in the industries

144. See Mark A. Lemley, *Scope*, 57 WM. & MARY L. REV. 2197, 2224–25 (2016) (arguing that where the only option is declaring IP rights invalid altogether, rather than in part, courts are reluctant to find invalidity).

145. A motivation behind administrative PIPR in the United States was cost:

It was thought that having challengers file IPRs early in the district court litigation process would allow the district court case to be stayed before substantial resources were spent on the case and that patent validity issues would subsequently play out in the lower-cost IPR process. If the patent validity was upheld in the IPR, the litigation would be streamlined because, as a result of the estoppel provisions, the challenger would be estopped from contesting in district court any validity issue that it could have presented in the IPR process; conversely, if the patent was invalidated in the IPR, the bulk of the district court litigation costs could be avoided entirely.

Daniel Golub, *IPRs Complicate the Litigation Funding Landscape for Patent Owners*, LANDSLIDE (2015), https://www.americanbar.org/publications/landslide/2015-16/september-october/iprs_complicate_litigation_funding_landscape_patent_owners.html.

146. UPCA, *supra* note 51, art. 69(1) (“Reasonable and proportionate legal costs and other expenses incurred by the successful party shall, as a general rule, be borne by the unsuccessful party, unless equity requires otherwise, up to a ceiling set in accordance with the Rules of Procedure.”). The volume of recoverable costs at the UPC exceeds those available both in the UK and in Germany. See Lunze & Rektorschek, *supra* note 119.

147. See, e.g., *About the UPC*, *supra* note 52 (“The UPC will not have any competence with regard to national patents.”).

amenable to patent troll behavior, the risk to opting in may outweigh the reward. Trolls may simply pick favorable national patent laws.

A crucial difference between the UPC and the United States is that in Europe, the UPC does not preempt national patent law.¹⁴⁸ In the United States, a troll has only one patent system to opt into and must take with it the PIPR mechanisms in place, however draconian they might seem. This is not the case under the UPCA. For European patents, there will be a seven-year transitional period in which a plaintiff may choose between the UPC and national courts.¹⁴⁹ For European patents filed before the end of this period, patent owners may opt out entirely from the UPC's jurisdiction.¹⁵⁰ And inventors are free to pursue national patents instead.

There are several disadvantages, for patent owners, to the UPC system. The first is the fee-shifting provision. As previously discussed, the loser will generally pay,¹⁵¹ and so a patent owner risks being dragged into a revocation action without even having intended to enforce its patent. In the case of technology sectors with frequently overbroad patents—for instance, biotechnology and computer technology¹⁵²—this risk is aggravated. The risk is further aggravated by what looks like a lax standing requirement for bring-

148. Patent law in the United States is federal, and patent infringement causes of action are provided for by federal statute. *See* 35 U.S.C. § 271 (2012); 28 U.S.C. § 1498.

149. *See* PATENT LITIGATION IN EUROPE, *supra* note 45, at 138.

150. *See id.* at 137. Some law firms already recommend opting out. *See, e.g.,* WilmerHale *The Future European Patent System: Update on the Latest News*, JDSUPRA (Spring 2016) <https://www.jdsupra.com/legalnews/the-future-european-patent-system-74833/> (“The possibility to opt out non-unitary European patents during the (initial) seven-year transitional period is one which all patentees must consider, in order to shelter their patents from the risk of a pan-European revocation by this unknown court.”).

151. UPCA, *supra* note 51, art. 69(1) (“Reasonable and proportionate legal costs and other expenses incurred by the successful party shall, as a general rule, be borne by the unsuccessful party, unless equity requires otherwise, up to a ceiling set in accordance with the Rules of Procedure.”). Notably, the UPCA notes that the court may take equitable considerations into account in fee-shifting, and the court’s draft rules on fees do institute a ceiling for fee shifting, as well as accounting for fairness:

Article 69 of the Agreement qualifies the general rule that the unsuccessful party shall bear the successful party’s costs by a number of principles, which serve as important safeguards when the Court makes its decision on costs, by allowing for exceptions from the general rule or limiting its application. . . . Firstly, only reasonable and proportionate legal costs and other expenses incurred by the successful party may be recovered from the unsuccessful party. Moreover, equity may also serve as a self-standing ground for rendering the general rule inapplicable. Furthermore, in case of partial success or in exceptional circumstances, the Court may order the parties to bear their own costs, or apply a different apportionment of cost, based on equity.

See RULES ON COURT FEES, *supra* note 128.

152. *See* Natasha N. Aljalilian, *The Role of Patent Scope in Biopharmaceutical Patents*, 11 B.U. J. SCI. & TECH. L. 1, 18 n.62 (2005) (discussing debate around whether biotechnological and software patents tend to be overbroad).

ing a revocation action.¹⁵³ Thus, where the value of an individual invention is uncertain,¹⁵⁴ a prospective patent owner might perceive a high risk to opting into the UPC.

The UPC's autonomy also highlights an institutional-dynamics concern. A product of an international treaty, the UPC is generally outside the control and competence of national courts and legislatures with respect to patent law issues.¹⁵⁵ This lack of oversight was one reason that the legality of the UPC was challenged, albeit unsuccessfully, before the Court of Justice.¹⁵⁶ Indeed, in what is perhaps surprising from the American perspective, the validity of a *national property right* will essentially be decided by two intertwined and remarkably autonomous international bodies. Patent owners under the UPC's jurisdiction might be concerned, for instance, about the fairness of its procedural rules or substantive decisions. Yet it is unclear how patent owners could seek review. In contrast, the United States subjects the PTAB to Article III judicial oversight.¹⁵⁷ There is some apparent oversight of the UPC, but it is limited. Decisions of the Court of Justice are binding, for instance.¹⁵⁸ But the Court of Justice has indicated that its oversight will be limited—after all, patent eligibility is not governed by European Union law.¹⁵⁹ The Rules of Procedure are promulgated internally by the Administrative Committee.¹⁶⁰ The UPCA does require that the European Commission be consulted,¹⁶¹ but, as with the Court of Justice, this oversight is limited to compatibility with European Union law. Further, the UPC is self-

153. See *supra* text accompanying notes 98–125 (discussing standing). Although a plaintiff incurs a fixed fee of €20,000 to bring a revocation action—a sort of procedural proxy for the economic interest aspect of standing—this is still much lower than the average cost of litigation. See RULES ON COURT FEES, *supra* note 128, at 9.

154. See Sichelman, *supra* note 10, at 343 (“At [the filing] stage, especially for modern technologies, an invention is usually not in the form of a finished product ready for sale, and its commercial success is highly uncertain. . . . Indeed, many of the twentieth century’s greatest inventions, including the television, radio, radar, and penicillin, were not commercialized until decades after they were invented.”).

155. See Jens Schovsbo et al., *The Unified Patent Court: Pros and Cons of Specialization—Is There a Light at the End of the Tunnel (Vision)?*, 46 IIC 271, 273 (2015).

156. See *supra* note 60.

157. For instance, by means of the Administrative Procedure Act, see, e.g., 5 U.S.C. §§ 701–706 (2012), as well as statutory appealability of various USPTO decisions, see, e.g., 35 U.S.C. § 141 (2012).

158. UPCA, *supra* note 51, art. 21.

159. See Case C-146/13, Spain v. European Parliament, 2015 WL Celex No. 613CJ0146, ¶¶ 24, 28–32 (sidestepping Spain’s concerns that “the decisions of [the UPC] boards of appeal are not subject to any form of judicial review, since the European Patent Organisation enjoys immunity from legal proceedings and enforcement”); *id.* ¶¶ 90, 101 (responding to concerns that the UPC “does not lay down any guarantees for the preservation of EU law” by holding that “the Court does not have jurisdiction to rule on the lawfulness of an international agreement concluded by Member States”).

160. UPCA, *supra* note 51, art. 41.

161. *Id.* art. 41(2).

funding¹⁶² and thus not subject to external withholding or spending pressure. The UPC, then, has more autonomy than the PTAB—a factor that might make patent owners, who have little political representation to ensure fairness, hesitate.

Whether these factors matter will depend on the costs and benefits of opting into the UPC. A prime consideration for a patent troll is the strength of a market—the business model only works if there is a relatively wealthy industry to pressure into settlements.¹⁶³ And such a market might not be homogeneous across Europe. For instance, patent trolls tend to target companies in specific industries—namely, electronics, machinery, and computer equipment¹⁶⁴—and these industries (and wealth) are not equally distributed.¹⁶⁵ Basically, a patent owner might only desire patents in the one or two countries with the potential for lucrative troll activity. Indeed, the incremental benefit of obtaining a unitary patent might be so low (for instance, no other companies to seek licenses from) and the incremental risk might be so high (for instance, twenty-five countries full of potential parties who could bring individual revocation actions) that a unitary patent might not make economic sense.¹⁶⁶

Nevertheless, one feature of the internal market—regional patent exhaustion¹⁶⁷—might limit the ability of patent trolls to rely only on select national patents. Like the concept of free movement of goods,¹⁶⁸ the doctrine is that patent rights are exhausted Union-wide for a product once it undergoes an authorized sale anywhere in the European Union.¹⁶⁹ Generally, exhaus-

162. *Id.* art. 36(1).

163. *See* Fusco, *supra* note 13, at 463–64 (“NPE activity is concentrated in markets where potential target companies produce high revenues. NPEs do not operate in countries, such as Poland, where the number of companies operating in the preferred industries is high, but revenues are low.”).

164. *Id.* at 456–57.

165. *See id.* at 463–64.

166. It might be argued that if there are no parties to assert patents against in a given country, then there are probably no parties with sufficient economic interest to pay the €20,000 revocation action fee. Nevertheless, certain countries might be active enough in the given technology to want to strike down an invalid patent (perhaps via an action brought by a collective interest group) but insufficiently wealthy to attract troll attention.

167. *See* Philip P. Soo, Note, *Enforcing a Unitary Patent in Europe: What the U.S. Federal Courts and Community Design Courts Teach Us*, 35 *LOY. L.A. INT’L & COMP. L. REV.* 55, 67–68 (2012) (describing patent exhaustion in the EU); *see also* UPCA, *supra* note 51, art. 29.

168. TFEU, *supra* note 116, art. 26(2).

169. *See* Case 15/74, *Centrafarm BV v. Sterling Drug Inc.*, 1974 E.C.R. 1147 (“[O]bstacles to free movement may be justifiable for reasons of protection of industrial property when the protection is invoked against a product coming from a Member State in which it is not patentable and has been manufactured by third parties without the consent of the patentee or where the original patentees are legally and economically independent of each other; the derogation to the principle of free movement of goods is not justified when the product has been lawfully put by the patentee himself or with his consent, on the market of the Member State from which it is being imported, e.g. in the case of a holder of parallel patents.”).

tion increases the incentive to seek as geographically broad patent protection as possible. Indeed, there is some suggestion that exhaustion limits patent troll activities.¹⁷⁰

Because patent trolls are typically exclusive licensees or assignees rather than inventors,¹⁷¹ this choice-of-law question might have a muted impact: if *inventors* opt for the UPC, then so must trolls. Thus, the economic considerations for patent trolls are likely less relevant than the economic considerations for inventors. Realistically, though, many inventors do not commercialize technology but rely on patent pooling firms to purchase and license their patents.¹⁷² Thus, the economic considerations of legitimate licensing firms and patent trolls are probably somewhat aligned. Of course, these economic considerations might just incentivize increased scrutiny in the *drafting* of patents expected to be economically important (and thus especially prone to validity challenges).¹⁷³ That is, the prospect of heavy post-issuance costs in defending or amending bad patents might incentivize increased clarity and narrowly drafted patent claims.¹⁷⁴ If so, this would indirectly accomplish the same goal as ex post PIPR of bad patents already in the hands of trolls.

170. See, e.g., Amelia Smith Rinehart, *Contracting Patents: A Modern Patent Exhaustion Doctrine*, 23 HARV. J.L. & TECH. 483, 530 (2010).

171. See Sichelman, *supra* note 10, at 369 (characterizing patent trolls as “firms that do not commercialize their patented inventions and perform little to no R & D”).

172. Universities are one such example—although they frequently license patents, universities are not equipped to commercialize technology themselves. See Mark A. Lemley, *Are Universities Patent Trolls?*, 18 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 611, 613–20 (2008) (observing parallels between university technology transfer practice and patent troll behavior).

173. Predicting the value of a patent, however, is difficult, and most patents are worthless. See Sichelman, *supra* note 10, at 343 (“About half, probably more, of all patented inventions in the United States are never commercially exploited. . . . At [the prosecution] stage, especially for modern technologies, an invention is usually not in the form of a finished product ready for sale, and its commercial success is highly uncertain”). Nonetheless, certain broad technology areas are statistically more susceptible to challenge. See, e.g., USPTO, PATENT TRIAL AND APPEAL BOARD STATISTICS 5 (Mar. 31, 2017), https://www.uspto.gov/sites/default/files/documents/AIA%20Statistics_March2017.pdf (indicating that 60% of post-issuance patent challenges under the IPR mechanism in the US occur within electrical and computer technologies).

174. See Stephen Yelderman, *Improving Patent Quality with Applicant Incentives*, 28 HARV. J.L. & TECH. 77, 108–11 (2014) (arguing that the impact of an invalidity ruling “may have the effect of pushing applicants toward narrower, more conservative claims”). *But see* Tun-Jen Chiang, *Fixing Patent Boundaries*, 108 MICH. L. REV. 523, 526 (2010) (arguing that the availability of amendments post-issuance is inefficient and that the best way to incentivize good patent drafting ex ante is to disallow such amendments) (“[T]he ability to amend claims allows patentees to cure any mistakes they make in drafting them. . . . Because patentees are the least-cost avoider of claim-drafting mistakes, this shifting of loss is inefficient.”); Yelderman, *supra* at 111–12 (acknowledging that “procedural preferences for post-grant narrowing amendments may create some incentives to seek broader claims in the first instance”). A fee-shifting regime changes the cost calculus for a patent owner and arguably attenuates Professor Chiang’s concern.

CONCLUSION

Post-issuance patent review (PIPR) is an invaluable error-correcting mechanism to prevent the socially harmful assertion of improperly issued patents. With the America Invents Act, the United States has recently established a new system for PIPR, expanding administrative routes to curtail bad patents. Europe has apparently gone a step further with the revocation action created by the Unified Patent Court Agreement (UPCA). The UPCA enables a revocation action on a broad range of grounds, at low cost, and with a relaxed standing requirement. But this is also an opt-in system with a loser-pays fee-shifting arrangement. Thus, although the structure of the UPC appears to be set up to facilitate efficient PIPR, the disincentives for opting in suggest that the UPC will be a less-effective troll-fighting vehicle than expected.