

STUDENT NOTE

**JUST ABOUT EQUIVALENT:  
A COMPARATIVE ANALYSIS OF THE DOCTRINES OF EQUIVALENTS IN  
THE UNITED STATES AND INTERNATIONAL JURISDICTIONS SHOWS  
THAT THE VARYING DOCTRINES ARE STRIKINGLY SIMILAR**

*Aaron Bowling\**

I.	INTRODUCTION .....	555
II.	THE POLICY BEHIND THE DOCTRINE OF EQUIVALENTS.....	557
	A. <i>Protecting the Patentee: Expanding the Exclusive Right to Non-Literal Equivalents Reflective of the Inventor’s Contribution</i> .....	557
	B. <i>Protecting the Public: Providing Clear Boundaries of the Patentee’s Exclusive Right</i> .....	560
	C. <i>Balancing the Competing Policy Interests</i> .....	560
III.	WHAT CONSTITUTES AN “EQUIVALENT”? .....	561
	A. <i>United States: Graver Tank and the “Function-Way-Result” Test, Interchangeability, and Insubstantial Differences</i> .....	562
	B. <i>European Union</i> .....	565
	1. <i>United Kingdom: Catnic and Purposive Construction</i> .....	566
	2. <i>Germany: The Kunststoffrohrteil Questions and Technical Teaching</i> .....	570
	C. <i>Japan: Ball Spline and Interchangeability of a Non-Essential Part</i> .....	572
	D. <i>Comparative Analysis</i> .....	575
	1. <i>Convergence Toward Interchangeability</i> .....	576

---

\* © 2013 Aaron P. Bowling. Mr. Bowling received his Juris Doctor degree from George Washington University Law School in May of 2013 and will join the Chicago office of Banner & Witcoff, LTD in 2013. Mr. Bowling previously earned his Bachelor of Science degree in Molecular and Cellular Biology from the University of Illinois at Champaign-Urbana in 2003, and his Masters Degree in Bioengineering and Biotechnology at Northwestern University in 2008. This written work does not reflect the views of the author’s corporation, its subsidiaries, and/or affiliates, law firm, its partners, or its clients. The opinions expressed are subject to change as the patent law develops.

---

	2.	Practical Application of Interchangeability.....	577
IV.		TIMING FOR EQUIVALENCY ANALYSIS AND COVERAGE OF UNFORESEEABLE EQUIVALENTS.....	579
	A.	<i>United States</i> .....	579
	B.	<i>Japan</i> .....	580
	C.	<i>United Kingdom</i> .....	581
	D.	<i>Germany</i> .....	582
	E.	<i>Comparative Analysis</i> .....	582
V.		LIMITATIONS ON THE DOCTRINE OF EQUIVALENTS IN THE UNITED STATES MAKE THE DOCTRINE SUBSTANTIALLY SIMILAR TO OTHER JURISDICTIONS .....	582
	A.	<i>Prohibition on Enlarging the Patent’s Metes and Bounds</i> .....	583
	B.	<i>“All Elements” Rule</i> .....	584
	C.	<i>Infringement by Disclaimed Embodiments</i> .....	585
	D.	<i>Prosecution History Estoppel</i> .....	586
	E.	<i>The Dedication Doctrine</i> .....	588
	F.	<i>Comparative Analysis of the Use of Prosecution History Estoppel and the Dedication Doctrine</i> .....	589
VI.		CONCLUSION.....	590

## I. INTRODUCTION

In today's international marketplace, successful businesses increasingly realize the possibilities and importance of global expansion. Yet, as business expands into foreign lands, adequate protection of proprietary information in those jurisdictions remains a concern for many. In the patent arena, one area of particular uncertainty is the doctrine of equivalents. This uncertainty need not be.

In the majority of contemporary patent systems, the claims of a patent specification define the metes and bounds of a patent holder's exclusive right.<sup>1</sup> Yet "the nature of language makes it impossible to capture the essence of a thing in a patent application."<sup>2</sup> As a result, the drafting of ideal claims by the patent draftsman and the proper interpretation of those claims by the court are two of the most perplexing aspects of patent law today.

The use of language to "capture the essence of a thing" presents a troublesome paradox.<sup>3</sup> If patent claims are interpreted narrowly such that only their literal language is given meaning, "unscrupulous copyists" can easily evade the patent holder's exclusive right with trivial variation,<sup>4</sup> greatly reducing the value of the patent. If the claims are interpreted broadly, the patentee's exclusive right will exceed his inventive contribution to the public domain, and inhibit, rather than encourage, further innovation. The doctrine of equivalents emerged from the need to balance unfettered copying and excessive market exclusion.

The doctrine of equivalents is a legal rule adopted by many of the world's advanced patent systems.<sup>5</sup> This doctrine allows a court to hold a party

---

<sup>1</sup> See *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 28 (1997).

<sup>2</sup> *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co. (Festo II)*, 535 U.S. 722, 731 (2002).

<sup>3</sup> See *id.*

<sup>4</sup> *Graver Tank & Mfg. Co. v. Linde Air Prods. Co. (Graver Tank II)*, 339 U.S. 605, 612 (1950).

<sup>5</sup> This Note addresses the doctrine of equivalents as applied in the United States, the United Kingdom, Germany, and Japan. These four nations provide especially valuable subjects for comparison because they each employ a highly advanced patent system that results from over a century of unique economic and legal history; and because these four nations were early signatories of the Paris Convention for the Protection of Industrial Property. See L. Kamran Bilir et al., *Do Treaties Encourage Technology*

liable for patent infringement if the infringing device does not fall within the *literal* scope of a patent claim, but is nonetheless equivalent to the claimed invention.<sup>6</sup> Facially, each jurisdiction's implementation of the doctrine of equivalents appears distinct, but closer comparative analysis reveals striking similarities between the application of these doctrines.

Universally, the core principle of the doctrine of equivalents is the same: to provide the patent holder with protection that includes inventions "equivalent" to the invention claimed.<sup>7</sup> In application, each jurisdiction must balance two competing interests. On the one hand, the doctrine must be applied with flexibility to protect the patentee from unforeseen advances in technology and the imperfections of language. On the other hand, each jurisdiction must continue to provide the public with a clear delineation of the exclusive rights conferred by the patent. In order for the public to comfortably innovate, it must be on notice of where the sphere of patent protection ends and the sphere of lawful exploitation begins. If these interests are appropriately balanced, the doctrine of equivalents will provide protection that accurately reflects the inventor's contribution and further encourages innovation.

Although the need for the doctrine of equivalents is recognized in developed patent systems, the parameters of the doctrine and its appropriate application are widely debated. This Note will compare and contrast the doctrines applied in four jurisdictions: the United States, the United Kingdom, Germany, and Japan. Each of these jurisdictions balances the interests between the patentee and the public differently, and each protects the patentee from non-literal infringement in a slightly distinct manner.

---

Transfer? Evidence from the Paris Convention 2-4 (May 19, 2011) (unpublished manuscript), [http://www.ssc.wisc.edu/~kbilir/Bilir\\_Moser\\_Talis.pdf](http://www.ssc.wisc.edu/~kbilir/Bilir_Moser_Talis.pdf). Nevertheless, a number of other jurisdictions have a doctrine of equivalents. See Juan Carlos Amaro & Hector Chagoya, *Mexico: Applying the Doctrine of Equivalents in Patent Litigation*, IAM MAGAZINE 1, 72 (2011), <http://www.iam-magazine.com/issues/complete.ashx?g=a4169eff-870c-4f39-ad00-459d81e88bff>; Patrick Dunaud et al., *France*, IAM MAGAZINE 1, 49-50 (2012), <http://www.iam-magazine.com/issues/complete.ashx?g=ad1035f3-895e-435e-b9d3-283cb9aaa033>.

<sup>6</sup> See *Graver Tank II*, 339 U.S. at 608.

<sup>7</sup> See *Festo II*, 535 U.S. at 728.

Part II of this Note explores the competing policies that give rise to the doctrine of equivalents. Parts III and IV examine the doctrines used in the United States, the United Kingdom, Germany, and Japan by focusing on three aspects of the doctrines: (1) the proper method of defining “equivalence;” (2) the proper time at which to determine “equivalence;” and (3) the several legal tenets that limit the applicability and reach of each doctrine. Lastly, Part V identifies several factors that distinguish the doctrines before examining the similarities that persist amongst them all.

## II. THE POLICY BEHIND THE DOCTRINE OF EQUIVALENTS

Stated broadly, the doctrine of equivalents allows a court to interpret the claims of a patent and find infringement in the absence of literal coverage over the accused device.<sup>8</sup> The doctrine provides additional protection to the patentee, but caution must be exercised in applying the doctrine, to ensure that the public is given adequate notice of the patent’s scope.

### A. *Protecting the Patentee: Expanding the Exclusive Right to Non-Literal Equivalents Reflective of the Inventor’s Contribution*

Language is an imprecise vehicle to describe technical concepts, and patent claims can be constrained by its limitations.<sup>9</sup> Patent protection is meaningless if a claim’s scope is interpreted so narrowly that trivial changes to a device can traverse the exclusive right of the inventor.<sup>10</sup> Courts thus use the doctrine of equivalents to provide protection to a wider range of technologies that fairly correspond with the inventor’s true contribution to the art.<sup>11</sup>

The doctrine of equivalents instructs a broader, non-literal interpretation of the patent claims, providing additional protection to the patentee by expanding the reach of the claims beyond the strict, literal reading of the

---

<sup>8</sup> *Graver Tank II*, 339 U.S. at 607-08.

<sup>9</sup> See *Festo II*, 535 U.S. at 731 (“[T]he nature of language makes it impossible to capture the essence of a thing in a patent application.”); Ray D. Weston, Jr., *A Comparative Analysis of the Doctrine of Equivalents: Can European Approaches Solve an American Dilemma?*, 39 IDEA 35, 40 (1998) (“A claim must describe an invention in words, which necessarily leads to a certain amount of fuzziness to the delimitation of the peripheral boundaries of the invention.”).

<sup>10</sup> *Graver Tank II*, 339 U.S. at 608.

<sup>11</sup> *Id.* at 609.

language. Instead of subordinating substance to form, the doctrine of equivalents finds infringement by holding two devices to be the same, even though they differ in name, form, or shape.<sup>12</sup> The need for this additional protection to the patentee is recognized in many jurisdictions,<sup>13</sup> including the United States,<sup>14</sup> the United Kingdom,<sup>15</sup> Germany,<sup>16</sup> and Japan.<sup>17</sup>

Each jurisdiction applies the doctrine of equivalents to protect the inventor from unscrupulous copyists who exploit the essence of the invention but evade infringement by making insubstantial changes that avoid the literal language of the claim.<sup>18</sup> Although a purely literal interpretation of the claims can promote a clear understanding of the patent's precise scope, a purely literal interpretation also yields inaccuracy and unfairness and can weaken the fundamental incentive-based rationale underlying the world's patent systems.<sup>19</sup>

---

<sup>12</sup> *Id.* at 608.

<sup>13</sup> *See* Amaro & Chagoya, *supra* note 5, at 72; Dunaud et al., *supra* note 5, at 50.

<sup>14</sup> *Festo II*, 535 U.S. at 731.

<sup>15</sup> *See generally* Hon. Sir Nicholas Pumfrey, Presentation at the AIPLA Annual Meeting: The Doctrine of Equivalents in UK Patent Law: Does it Exist? How Does it Work? 4 (Oct. 14, 2004) (citing *Catnic Components Ltd. v. Hill & Smith Ltd.*, [1982] R.P.C. 183 (H.L.)).

<sup>16</sup> *See generally* Peter Meier-Beck, Judge, Bundesgerichtshof, Karlsruhe, Presentation at the AIPLA Annual Meeting: The Scope of Protection Conferred by the European Patent: A German Perspective on the Doctrine of Equivalence 1 (Oct. 14, 2004).

<sup>17</sup> *See generally* Toshiko Takenaka, *The Supreme Court Affirmed the Presence of the Doctrine of Equivalents under Japanese Patent System*, 5 CASRIP Newsl., no. 1, Winter 1998, available at <http://www.law.washington.edu/Casrip/Newsletter/default.aspx?year=1998&article=newsv5i1jp1>.

<sup>18</sup> *Graver Tank II*, 339 U.S. 605, 607 (1950) (“[O]ne who seeks to pirate an invention, like one who seeks to pirate a copyrighted book or play, may be expected to introduce minor variations to conceal and shelter the piracy,” because “[o]utright and forthright duplication is a dull and very rare type of infringement.”).

<sup>19</sup> *Id.* at 614 (Black, J., dissenting) (arguing that the statute and Supreme Court precedent “forbid[] treating a patent claim ‘like a nose of wax, which may be turned and twisted in any direction, by merely referring to the specification, so as to make it include something more than, or something different from, what its words express.’”); *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*,

Uncertainty in the patent's scope is the price for ensuring the appropriate incentives for innovation.<sup>20</sup>

Additionally, some jurisdictions apply the doctrine of equivalents to protect the patentee from unforeseen advances in technology.<sup>21</sup> For example, a claim's draftsman can only describe her invention in the terms currently available in the art, as "words do not exist to describe it,"<sup>22</sup> or an inventor might rely on new principles not yet fully understood.<sup>23</sup> Similarly, some jurisdictions utilize the doctrine of equivalents to protect the inventor from nascent technologies that are equivalent to the claimed elements of the invention, but were not included in the literal language of the claims because they did not exist at the time the patentee drafted her claims.<sup>24</sup> In this way, the doctrine of equivalents helps the courts ensure that patent owners receive protection for their true contribution to the art.

Lastly, speed and secrecy are becoming more important to the patent drafter, in part because of innovations such as the first-to-file system adopted in the United States as part of the America Invents Act.<sup>25</sup> This might further justify additional protection for the patentee and additional flexibility in the inclusion of equivalents in the patentee's right to exclude.

---

520 U.S. 17, 29 (1997) ("We do, however, share the concern of the dissenters below that the doctrine of equivalents, as it has come to be applied since *Graver Tank*, has taken on a life of its own, unbounded by the patent claims. There can be no denying that the doctrine of equivalents, if applied broadly, conflicts with the definitional and public-notice functions of the statutory claiming requirement.").

<sup>20</sup> *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co. (Festo I)*, 234 F.3d 558, 619 (Fed. Cir. 2000), *vacated*, 535 U.S. 722 (2002).

<sup>21</sup> *Id.* (citing *Warner-Jenkinson Co.*, 520 U.S. at 37).

<sup>22</sup> *Autogiro Co. of Am. v. United States*, 384 F.2d 391, 397 (Ct. Cl. 1967).

<sup>23</sup> John A. Burtis, Comment, *Towards a Rational Jurisprudence of Computer-Related Patentability in Light of In re Alappat*, 79 MINN. L. REV. 1129, 1136 n.34 (1995).

<sup>24</sup> See Harold C. Wegner, *Equitable Equivalents: Weighing the Equities to Determine Patent Infringement in Biotechnology and Other Emerging Technologies*, 18 RUTGERS COMPUTER & TECH. L.J. 1, 35-36 (1992).

<sup>25</sup> Leahy-Smith America Invents Act, Pub. L. No. 112-29, sec. 3, 125 Stat. 284, 285-93 (2011).

## B. *Protecting the Public: Providing Clear Boundaries of the Patentee's Exclusive Right*

The public interest counterbalances the interest in fair and accurate patent scope, and it demands straightforward notice of the specific boundaries of a patentee's exclusive right.<sup>26</sup> Like all property rights conferring a right to exclude, a patent must be granted in a way that provides third parties with clear boundaries of that right.<sup>27</sup>

Providing the public with unambiguous boundaries of the patentee's right to exclude allows calculated and efficient investments in innovation,<sup>28</sup> and encourages the public to invent around the patented device with prior art techniques or new innovations.<sup>29</sup> Unclear patent scope can cause third parties to invest unintentionally in products covered by the patent or cause the patentee to engage in wasteful litigation against products that are eventually found non-infringing.<sup>30</sup> Additionally, unclear patent scope can curtail competition, as companies might be unwilling to assume the risk of infringement in areas near the edges of the exclusive right.<sup>31</sup> It can cause competitors to divert resources from other uses in order to combat the risk of patent litigation, consequently reducing funding for research, development, and innovation.<sup>32</sup>

## C. *Balancing the Competing Policy Interests*

A number of major patent jurisdictions recognize the interplay of these competing policy interests,<sup>33</sup> and strike a balance between them in a manner that

---

<sup>26</sup> See *White v. Dunbar*, 119 U.S. 47, 52 (1886).

<sup>27</sup> *Festo II*, 535 U.S. 722, 731-32 (2002).

<sup>28</sup> *Festo I*, 234 F.3d 558, 564 (Fed. Cir. 2000).

<sup>29</sup> J. Jason Lang, Comment, *The German Resolution: A Proposed Doctrine of Equivalents Analysis and a Flexible Rule of Prosecution History Estoppel for Biotechnology*, 52 EMORY L.J. 427, 431 (2003).

<sup>30</sup> *Festo I*, 234 F.3d at 597 (Lourie, J., concurring).

<sup>31</sup> *Id.*

<sup>32</sup> Wegner, *supra* note 24, at 30.

<sup>33</sup> *E.g.*, Convention on the Grant of European Patents, art. 69, Oct. 5, 1973, 13 I.L.M. 270 (amended by the act revising E.P.C. of Nov. 2000 and the act revising Art. 63 E.P.C. of Dec. 17, 1991, and by the Admin. Council of the E.P.O. on Dec. 21, 1978, Dec. 13, 1994, Oct. 20, 1995, Dec. 5, 1996, and Dec. 10, 1998); Protocol on the Interpretation of Article 69 of the Convention, art. 1,



reflects the jurisdiction's cultural values, historical triumphs and failures, and unique perspective on how best to incentivize innovation. For example, the United Kingdom tends to lean toward protecting the public interest, reasoning that patent law is an exception to the ban on monopolies that has long persisted there.<sup>34</sup> Japan also leans toward the public interest, but reasons that disseminating new technology into industry outweighs the incentive benefits of exclusive protection.<sup>35</sup> By contrast, Germany tends to lean toward the inventor's interest, a position its courts believe better incentivizes innovation.<sup>36</sup>

Armed with a firm understanding of these policy interests, one can better explore and evaluate the doctrine of equivalents as practiced in each jurisdiction. This Note examines each country's doctrine by fragmenting the doctrine into three components: (1) the method used to characterize an "equivalent," (2) the time at which the court determines "equivalence," and (3) the subsequent limitations that constrain the application of the doctrine.

### III. WHAT CONSTITUTES AN "EQUIVALENT"?

The doctrine of equivalents has evolved independently in the United States, the United Kingdom, Germany, and Japan through decades of jurisprudence. Although each jurisdiction began utilizing the doctrine of equivalents at different times and under unique historical and cultural circumstances, there is now substantial consistency in each country's method of determining whether a certain element is "equivalent" to the claimed invention.

Importantly, the *definition* of an equivalent is not dispositive in determining the application of the doctrine of equivalents. As discussed in Part V,<sup>37</sup> countries with a broader definition of "equivalent" couple that definition with a variety of legal tenets that limit the application of the doctrine. In practice,

---

Oct. 5, 1973, 13 I.L.M. 348 (amended by the act revising E.P.C. of Nov. 2000) (defining the scope of patent protection based on the patent claims, yet advising EU members: "[claims are] to be interpreted as defining a position between these extremes which combines a fair protection for the patentee with a reasonable degree of certainty for third parties.").

<sup>34</sup> Weston, *supra* note 9, at 49.

<sup>35</sup> Toshiko Takenaka, *Patent Infringement Damages in Japan and the United States: Will Increased Patent Infringement Damage Awards Revive the Japanese Economy?*, 2 WASH. U. J. L. & POL'Y 309, 309-10 (2000).

<sup>36</sup> Weston, *supra* note 9, at 52.

<sup>37</sup> See *infra* Part V.

this creates striking similarities between the definitions of the several countries. But, before considering such limitations, practitioners and courts must first define the scope of what constitutes an “equivalent” of the claimed invention.<sup>38</sup> Upon careful comparison, it becomes evident that the United States’ definition of “equivalent” is the most inclusive, followed by the Japanese and German definitions, with the United Kingdom’s definition being the least inclusive.

**A. *United States: Graver Tank and the “Function-Way-Result” Test, Interchangeability, and Insubstantial Differences***

In the United States, 35 U.S.C. § 271 embodies the infringement analysis, and directs the courts to find infringement only upon literal or textual infringement of the claimed invention.<sup>39</sup> The doctrine of equivalents initially arose out of common law jurisprudence in *Winans v. Denmead*, in which the Supreme Court first allowed patent holders to enforce their property rights against competitors who had avoided the literal language of the claims.<sup>40</sup>

Historically, the United States used central claiming, which meant that the patent specification “captured the central point of invention,” in contrast with the modern utilization of claim limitations.<sup>41</sup> The United States adopted the practice of peripheral claiming in the Patent Act of 1870.<sup>42</sup> Peripheral claiming allows the claims to define the metes and bounds of the patent holder’s exclusive right.<sup>43</sup> Under this practice, which continues today, “the specification shall

---

<sup>38</sup> See *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 39 (1997).

<sup>39</sup> 35 U.S.C. § 271 (2006).

<sup>40</sup> *Winans v. Denmead*, 56 U.S. 330, 343 (1853) (stating: “[t]he exclusive right to the thing patented is not secured, [sic] if the public are at liberty to make substantial copies of it, varying its form or proportions. And, therefore, the patentee, having described his invention, and shown its principles, and claimed it in that form which most perfectly embodies it, is, in contemplation of law, deemed to claim every form in which his invention may be copied, unless he manifests an intention to disclaim some of those forms.”).

<sup>41</sup> See *Pennwalt Corp. v. Durand-Wayland, Inc.*, 833 F.2d 931, 959 (Fed. Cir. 1987) (Newman, J., dissenting) (summarizing history of claim drafting and claim interpreting practices).

<sup>42</sup> Patent Act of 1870, ch. 230, §26, 16 Stat. 198, 201 (1870) (repealed 1952).

<sup>43</sup> *Id.*; see also Wegner, *supra* note 24, at 19.

conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention."<sup>44</sup>

The next key historical development was a test espoused by the Supreme Court in *Graver Tank Manufacturing Co. v. Linde Air Products, Co.*<sup>45</sup> In *Graver Tank*, an allegedly infringing welding composition was almost identical to the patented composition, the only difference was the use of manganese silicate instead of magnesium silicate.<sup>46</sup> Employing what is now known as the "function-way-result," or the "tripartite" test, the Court stated that the modified welding composition infringed the patented composition because it performed "substantially the same function in substantially the same way to obtain the same result."<sup>47</sup>

The *Graver Tank* Court also suggested that "interchangeability" can be used as a criterion for determining whether a given element is "equivalent." To determine interchangeability, it is necessary to ask "whether persons reasonably skilled in the art would have known of the interchangeability of an ingredient not contained in the patent with one that was."<sup>48</sup> The Court also proposed an "insubstantial differences" inquiry, noting that equivalence might exist if the differences between the allegedly infringing device and the claimed invention are "insubstantial, in view of the technology and prior art."<sup>49</sup>

In subsequent cases, the Court reaffirmed that equivalency is a complex, multi-faceted, and fact-based inquiry that properly includes consideration of the patent's context, the prior art, and the particular facts of each case.<sup>50</sup> The Supreme Court endorses no single test as the exclusive means for determining equivalence. Each test expounded by the *Graver Tank* court might be the most

---

<sup>44</sup> 35 U.S.C. § 112 ¶ 2 (2006).

<sup>45</sup> *Graver Tank II*, 339 U.S. 605, 608 (1950).

<sup>46</sup> *Id.* at 610.

<sup>47</sup> *Id.* at 608.

<sup>48</sup> *Id.* at 609. The *Graver Tank* Court determined from expert testimony at the trial level that magnesium silicate was shown in the prior art to be an effective ingredient in welding compositions, and therefore clear to one skilled in the art to be interchangeable with magnesium silicate. *Id.* at 611-12.

<sup>49</sup> *Id.* at 610.

<sup>50</sup> See *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 29 (1997).

appropriate test, whether it be the “function-way-result” test,<sup>51</sup> the “insubstantial differences” approach,<sup>52</sup> or the “interchangeability” inquiry.<sup>53</sup> Which of the three *Graver Tank* tests is most applicable requires a case-by-case determination.

Together, the several tests for defining an “equivalent” in the United States offer patent holders broad protection from non-literal infringement.<sup>54</sup> As a result, this evaluation of “equivalency” has been criticized for being overly broad and diminishing the incentive for effective claim drafting by the initial claims draftsman.<sup>55</sup> Critics have characterized the United States’ equivalency analysis as a fact-intensive judgment call,<sup>56</sup> an evaluation that often requires a “battle of the experts” and can lead to judicial subjectivity.<sup>57</sup>

Nevertheless, despite the broad definition of “equivalent,” the *application* of the doctrine of equivalents in the United States is limited by four legal tenets: (1) the limitation on enlarging the metes and bounds of the claim, (2) the “all

---

<sup>51</sup> *Hilton Davis Chem. Co. v. Warner-Jenkinson Co.*, 62 F.3d 1512, 1531 (Fed. Cir. 1995) (applying the function-way-result test to determine equivalence).

<sup>52</sup> *Honeywell Int’l Inc. v. Hamilton Sundstrand Corp.*, 370 F.3d 1131, 1139 (Fed. Cir. 2004) (determining equivalence on the basis of insubstantial differences and noting that “[a]n element in the accused device is equivalent to a claim limitation if the only differences between the two are insubstantial.”).

<sup>53</sup> *Litton Sys., Inc. v. Honeywell Inc.*, 140 F.3d 1449, 1465 (Fed. Cir. 1998) (noting that “known interchangeability is often synonymous with equivalence.”); *Warner-Jenkinson*, 520 U.S. at 25 (pointing to “interchangeability” as a criteria in the equivalency analysis); *see also* *Tex. Instruments, Inc. v. U.S.I.T.C.*, 805 F.2d 1558, 1571 (Fed. Cir. 1986) (holding that an element of an allegedly infringing device is equivalent to that of an element in the claimed device if it can be substituted into the claimed device without changing the “principle and operation” of that device).

<sup>54</sup> William T. Ralston, *Foreign Equivalents of the U.S. Doctrine of Equivalents: We’re Playing in the Same Key but It’s Not Quite Harmony*, 6 CHI-KENT J. INTEL. PROP. 177, 191 (2007).

<sup>55</sup> *Graver Tank II*, 339 U.S. 605, 613 (1950) (Black, J. dissenting) (arguing that the claim draftsman has the responsibility to claim everything he wishes to be protected by the patent, and noting the possibility of amending the patent if necessary).

<sup>56</sup> *Leggett & Platt, Inc. v. Hickory Springs Mfg. Co.*, 285 F.3d 1353, 1359 (Fed. Cir. 2002).

<sup>57</sup> *See Festo I*, 234 F.3d 558, 594 (Fed. Cir. 2000) (Plager, J., concurring).

elements rule," (3) prosecution history estoppel, and (4) the dedication doctrine.<sup>58</sup> As a result, the United States' definition of "equivalent," although broad, is applied in a limited manner that brings its doctrine very closely in line with the doctrines of other jurisdictions.

## B. *European Union*

In member nations of the European Union, the European Patent Convention (EPC) lays the foundation for proper patent claim interpretation.<sup>59</sup> Article 69 of the EPC calls for a claim-based definition of claim scope: "[t]he extent of the protection conferred by a European patent or a European patent application shall be determined by the terms of the claims," and "the description and drawings shall be used to interpret the claims."<sup>60</sup> The EPC also promulgated a Protocol on the Interpretation of Article 69, instructing national courts on the proper implementation of Article 69.<sup>61</sup> The Article 69 Protocol states that Article 69 should be interpreted:

not . . . [so] that the extent of the protection conferred by a European patent is . . . defined by the strict, literal meaning of the wording used in the claims . . . [but] [n]either should it be interpreted . . . [so] that the claims serve only as a guideline . . . . On the contrary, it is to be interpreted as defining a position between these extremes which combines a fair protection for the patentee with a reasonable degree of certainty for third parties.<sup>62</sup>

In 2000, the Article 69 Interpretation Protocol was amended to include a second portion entitled "Equivalents" that states: "[f]or the purpose of

<sup>58</sup> *Festo II*, 535 U.S. 722, 731 (2002). These tenets and their limiting effect are discussed in further detail *infra* Part V.

<sup>59</sup> "The [EPC] is a treaty among thirty-six (as of March, 2010) European countries (not necessarily members of the EU) setting up a common patent office, the European Patent Office . . . which examines patent applications designated for any of those countries under a common patent procedure and issues a European patent valid in all of the countries designated." Masaaki Kotabe, *Evolving Intellectual Property Protection in the World: Promises and Limitations*, 1 U. P.R. BUS. L.J. 1, 13 (2010).

<sup>60</sup> Convention on the Grant of European Patents, *supra* note 33, art. 69.

<sup>61</sup> Protocol on the Interpretation of Article 69 of the Convention, *supra* note 33, art. 1.

<sup>62</sup> *Id.*

determining the extent of protection conferred by a European patent, due account shall be taken of any element which is equivalent to an element specified in the claims.”<sup>63</sup> Nevertheless, “equivalent” is undefined, and it is generally thought that the 2000 amendment left the EPC viewpoint on the doctrine of equivalents unchanged.<sup>64</sup> Although the EPC lays the basic groundwork for claim interpretation in member nations, its ambiguities allow for variation in the laws of each member nation.

### 1. United Kingdom: *Catnic* and Purposive Construction

The United Kingdom includes non-literal equivalents in the scope of patent claims by giving the terms of those claims a “purposive construction” that analyzes equivalence from the perspective of one skilled in the art who is strictly tied to the language of the claims.<sup>65</sup> Historically, claim interpretation in the United Kingdom arose in common law, and was influenced by the nation’s anti-monopolistic roots.<sup>66</sup> Consequently, courts in the United Kingdom construe claims narrowly.<sup>67</sup> Non-literal infringement by equivalent elements first arose as the “pith and marrow” doctrine.<sup>68</sup> Under this doctrine, the court would examine the description and claim language to identify which elements the inventor considered to be “essential” and proclaim those “essential elements” to be the “pith and marrow” of the invention.<sup>69</sup> The accused device infringed the patent as

---

<sup>63</sup> *Id.* art. 2.

<sup>64</sup> Nicholas Pumfrey et al., *The Doctrine of Equivalents in Various Patent Regimes – Does Anybody Have It Right?*, 11 YALE J.L. & TECH. 261, 283 (2009) (pointing out that the amendment modifies the protocol for interpreting Article 69, not Article 69 itself, and noting that it is unlikely that the protocol for Article 69 permits protection beyond the language of the claims).

<sup>65</sup> *Catnic Components Ltd. v. Hill & Smith Ltd.*, [1982] R.P.C. 183, 241-42 (H.L.); see also *Improver Corp. v. Remington Consumer Prods. Ltd.*, [1990] F.S.R. 181, 188-89 (Pat.Ct.) (discussing the “purposive construction” test expounded by the House of Lords in *Catnic*).

<sup>66</sup> *Weston*, *supra* note 9, at 40.

<sup>67</sup> *Id.*

<sup>68</sup> *Marconi v. British Radio Tel. & Tel. Co. Ltd.*, [1911] 28 R.P.C. 181, 217 (Ch).

<sup>69</sup> *Id.* at 217-18.

long as it included all the essential elements, even if it omitted or contained an equivalent for an inessential element.<sup>70</sup>

Following the enactment of the EPC, the United Kingdom codified Section 125 of the Patents Act of 1977. Section 125 embodies the EPC's claim construction principles and establishes three approaches to claim interpretation.<sup>71</sup> The second approach<sup>72</sup> provides that the claim scope can only stretch beyond the literal terms of the claims if the literal meaning of a term used in the claim is clear, but another meaning presents itself after looking at the specification and the drawings.<sup>73</sup> Generally, the United Kingdom applies the EPC and Section 125 to require consideration of variants when construing a term in accordance with the descriptions and drawings, but the scope of the patent only extends to those variants within the language of the patent claim.<sup>74</sup>

The House of Lords first interpreted the claim construction provisions of Section 125 and established the United Kingdom's modern purposive construction infringement analysis in 1982, in *Catnic Components Ltd. v. Hill & Smith Ltd.*<sup>75</sup> The purposive construction infringement analysis provided an alternative to the "purely literal one derived from applying to it the kind of meticulous verbal analysis in which lawyers are too often tempted by their

---

<sup>70</sup> *Id.* at 182.

<sup>71</sup> Patents Act, 1977, c. 37, § 125 (Eng.).

<sup>72</sup> The first approach is to look at the language in the claims and the third approach is to interpret the specification description. *Id.*

<sup>73</sup> See *Kirin-Amgen Inc. v. Hoechst Marion Roussel Ltd.*, [2005] 1 All E.R. 667, 678 (H.L.); Patents Act, 1977, c. 37, § 125 (read in light of Article 69 of the EPC, the alternative term must only be given the meaning that emerges from the specification and the drawings).

<sup>74</sup> *Kirin-Amgen*, 1 All E.R. at 685 ("Although article 69 prevents equivalence from extending protection outside the claims, there is no reason why it cannot be an important part of the background of facts known to the skilled man which would affect what he understood the claims to mean. That is no more than common sense. It is also expressly provided by the new art [sic] 2 added to the Protocol by the Munich Act revising the EPC, dated 29 November 2000 . . .").

<sup>75</sup> *Catnic Components Ltd. v. Hill & Smith Ltd.*, [1982] R.P.C. 183, 243 (H.L.); see also *Improver Corp. v. Remington Consumer Prods. Ltd.*, [1990] F.S.R. 181, 190 (Pat. Ct.).

training to indulge."<sup>76</sup> As with the pith and marrow approach, courts employing purposive construction ask:

whether persons with practical knowledge and experience of the kind of work in which the invention was intended to be used, would understand that strict compliance with a particular descriptive word or phrase appearing in a claim was intended by the patentee to be an essential requirement of the invention so that *any* variant would fall outside the monopoly claimed, even though it could have no material effect upon the way the invention worked.<sup>77</sup>

In *Catnic*, a steel girder for door and window assembly with two supports claimed as "extending vertically" from the lower plate to the upper plate was held to be infringed by a similar girder device that contained supports inclined six to eight degrees from vertical.<sup>78</sup> The court held that the variation had no material effect on the load-bearing purpose of the device, the variation did not affect the way the device obtained its result, and the variation was obvious to one skilled in the art at the time of the patent's publication.<sup>79</sup> Most importantly, the court held that one skilled in the art would not have interpreted the claims to mean that the patentee intended it to be an essential requirement that the supports be at exactly ninety degrees.<sup>80</sup> As a result, the court's purposive construction of the term "extending vertically" yielded the definition: "extending vertically with the range of angles which give substantially the maximum load-bearing capacity and of which ninety degrees is the perfect example."<sup>81</sup> Despite the non-literal construction of the terms, the court repeatedly emphasized that, to find infringement by an equivalent, the equivalent must still fall within the language of the claim.<sup>82</sup> Equivalents that fall outside the literal language of the

---

<sup>76</sup> *Catnic*, [1982] R.P.C. at 243; see also *Improver*, [1990] F.S.R. at 193.

<sup>77</sup> *Catnic*, [1982] R.P.C. at 243.

<sup>78</sup> *Id.* at 188, 218.

<sup>79</sup> *Id.* at 232.

<sup>80</sup> *Id.* at 242.

<sup>81</sup> *Id.* at 244.

<sup>82</sup> *Id.* at 242.



claim do not infringe, even if the circumstances involve unfair copying of the very essence of the inventive concept.<sup>83</sup>

Shortly after the *Catnic* decision, Lord Hoffman in *Improver Corporation v. Remington Consumer Products, Ltd.*, established a three-prong test to determine equivalency and to decide whether the alleged infringement is outside the “primary, literal or contextual meaning” of the word or phrase in question.<sup>84</sup> Under the *Improver* test, the variant element was deemed equivalent only if: (1) it had no material effect upon the invention’s manner of operation;<sup>85</sup> (2) the lack of material effect was obvious to an expert in the field, at the time of publication;<sup>86</sup> and (3) one skilled in the art, reading the language of the claim, would *not* be led to understand that the patentee intended strict compliance with the primary meaning to be an essential requirement of the invention.<sup>87</sup>

The test articulated in *Improver* was not lasting, and the House of Lords departed from it in *Kirin-Amgen Inc. v. Hoechst Marion Roussel Ltd.* In *Kirin-Amgen*, the court declared that the *Improver* test is not to be strictly applied as the sole test for whether infringement is outside the “primary, literal or contextual meaning” of the word or phrase in question.<sup>88</sup> According to the *Kirin-Amgen* court:

---

<sup>83</sup> *Id.* at 243.

<sup>84</sup> *Improver Corp. v. Remington Consumer Prods. Ltd.*, [1990] F.S.R. 181, 189 (Pat. Ct.).

<sup>85</sup> *Id.* at 191.

<sup>86</sup> *Id.* at 192 (explaining that the second prong does not address the obviousness of choosing the variant, but rather asks whether one skilled in the art, if presented with the invention and the variant, would consider it obvious that the variant would work in the same way).

<sup>87</sup> *Id.* at 193-95 (noting that this prong provided a basis for court to decide not to include equivalents in a given claim, because the patentee did not want the claim to be so expanded, despite the fact that the variant operated in exactly the same manner as the patented invention. The court reviewed the patent specification to demonstrate that the inventor did not intend “helical spring” to include equivalents such as a rubber rod, even though the allegedly infringing device operated in the same manner as that claimed).

<sup>88</sup> *Kirin-Amgen Inc. v. Hoechst Marion Roussel Ltd.*, [2005] 1 All E.R. 667, 686, 690 (H.L.) (opining that the *Improver Corp.* guidelines have limited value in certain circumstances, as in the present case, because a person skilled in the art would not have considered the alleged equivalent within the scope of the

'Purposive construction' does not mean that one is extending or going beyond the definition of the technical matter for which the patentee seeks protection in the claims. The question is always what the person skilled in the art would have understood the patentee to be using the language of the claim to mean...There will be occasions upon which it will be obvious to the skilled man that the patentee must in some respect have departed from conventional use of language or included in his description of the invention some element which he did not mean to be essential. But one would not expect that to happen very often.<sup>89</sup>

## 2. Germany: The *Kunststoffrohrteil* Questions and Technical Teaching

Like the United States, Germany has historically used a central claim approach, where any device that embodied the same "inventive concept" as claimed in the patent would infringe.<sup>90</sup> The German courts interpreted patents broadly, such that interchangeable elements were included within the patent scope.<sup>91</sup>

Following the passage of the EPC, Germany shifted to peripheral claiming and "function-aimed interpretation," which looks at the "technical function of each individual feature of the patent claim" as understood by a person skilled in the art.<sup>92</sup> Rather than looking at isolated terms and features of the patent, the hypothetical person of ordinary skill in the art is instructed to look to the claim terms in the context of the entire claim and set of claims, using the

---

claim, and this answer to the third *Improver* question was sufficient to determine that the variant was not within the scope of the claimed invention).

<sup>89</sup> *Id.* at 681, 684 ("The *Catnic* principle of construction is therefore in my opinion precisely in accordance with the Protocol.").

<sup>90</sup> Ralston, *supra* note 54, at 187.

<sup>91</sup> Weston, *supra* note 9, at 53.

<sup>92</sup> Bundesgerichtshof [BGH] [Federal Court of Justice] Mar. 2, 1999, Case No. X ZR 85/96 (Ger.) (*Tension Screw*), translated in 30 IIC 932, 939 (1999); Allan M. Soobert, *Analyzing Infringement by Equivalents: A Proposal to Focus the Scope of International Patent Protection*, 22 RUTGERS COMPUTER & TECH. L.J. 189, 190 (1996); Meier-Beck, *supra* note 16, at 3.

description, prior art, and common sense.<sup>93</sup> In this “context-based interpretation,” the “patent specifications [are] . . . their own lexicon.”<sup>94</sup>

The scope of German patent coverage of non-literal equivalents closely adheres to EPC Article 69 by determining patent scope on the basis of the claims, as analyzed by one skilled in the art using the description and the drawings to interpret the claims.<sup>95</sup> The German analysis consists of four questions, often referred to as the “*Kunststoffrohrteil* questions,” and deems a variant element equivalent to that claimed if: (1) the varied embodiment “solves the problem underlying the invention with modified but objectively equivalent means;”<sup>96</sup> (2) a person of ordinary skill in the art was able to use his specialized knowledge to identify the modified means as having the same effect;<sup>97</sup> (3) the considerations applied by the skilled artisan are specifically drawn from the technical teaching of the claim;<sup>98</sup> and (4) the modified embodiment is not anticipated or made obvious by the state of the art (the “*Formstein* objection”).<sup>99</sup>

---

<sup>93</sup> *Tension Screw*, 30 IIC at 932.

<sup>94</sup> *Id.* at 939.

<sup>95</sup> Bundesgerichtshof [BGH] [Federal Court of Justice] Jun. 14, 1988, Case No. X ZR 5/87 (Ger.) (*Ion Analysis*), translated in 22 IIC 249, 252-53 (1991).

<sup>96</sup> Bundesgerichtshof [BGH] [Federal Court of Justice] Mar. 12, 2002, Case No. X ZR 168/00 (Ger.) (*Cutting Blade I*), translated in 33 IIC 873, 875 (2002) (“[M]odified but objectively equivalent means” has been interpreted as “means which have objectively the same technical effect.”); see Pumfrey et al., *supra* note 64, at 291-92. To answer this question in the affirmative, the identical result must be achieved to a “practically relevant degree,” as opposed to merely a similar result.

<sup>97</sup> *Cutting Blade I*, 33 IIC at 875. This prong of the analysis excludes modified devices from the scope of the patent if an inventive step was necessary for a person of ordinary skill in the art to find the modified means as having the same effect. It limits the patent’s scope by ensuring that a sufficient technical teaching will not fall within the scope of the patent.

<sup>98</sup> *Id.* As distinguished from the second question, this question asks what a person of ordinary skill in the art would have been able to do and would have done on the basis of the patent claim, not simply with knowledge of the patent.

<sup>99</sup> Bundesgerichtshof [BGH] [Federal Court of Justice] Apr. 29, 1986, Case No. X ZR 28/85 (Ger.) (*Moulded Curbstone*), translated in 18 IIC 795, 800 (1987) (allowing objection for the first time). This objection, raised only if the first

In summary, a German patent can be infringed by an accused product falling outside the literal scope of the claim if the prior art and the patent claim in question made those variants obvious to a person skilled in the art on the priority date. This is the case if the three *Kunststoffrohrteil* questions are answered affirmatively and the *Formstein* objection is not met.<sup>100</sup>

C. *Japan: Ball Spline and Interchangeability of a Non-Essential Part*

Under Japanese patent law, infringement is found if the allegedly infringing invention falls within the “technical scope” of the patented invention, where the technical scope is determined with respect to the claim itself.<sup>101</sup>

Historically, Japanese commentators urged that patent protection from non-literal infringement should be provided if two requirements were met.<sup>102</sup> The first, “interchangeability,” requires that the substituted element in the allegedly infringing device achieve the same function and result as the corresponding element found in the patented invention.<sup>103</sup> This requirement is only met if the two elements have an identical “underlying technological idea;” the scope of protection would not cover a different “technological idea,” even if the same function and result were achieved by the modified device.<sup>104</sup> The

---

three questions are answered affirmatively, prevents the patent scope from expanding into the prior art, or what would be obvious in light of the prior art. This requirement is necessary in the German system because only the subject matter of a patent application is evaluated for patentability by the German Patent Office, and the adequate scope of protection is determined after infringement is alleged.

<sup>100</sup> *Id.* at 803.

<sup>101</sup> Japanese Patent Act (Act No. 121, Apr. 13, 1959), ch. 4, art. 70, § 1 (Japan), translated in MANUAL FOR THE HANDLING OF APPLICATIONS FOR PATENTS, DESIGNS AND TRADE MARKS THROUGHOUT THE WORLD 1-74 (Arnold & Siedsma eds., Kluwer Law Int'l Supp. 2010).

<sup>102</sup> Pumfrey et al., *supra* note 64, at 296-97 (citing Judge Ryoichi Mimura, *Hanrei Kaisetsu* [Court Precedent Commentary], 10 SAIKŌ SAIBANSHO HANJI KAISETSU MINJI HEN [COMMENTS TO THE SUPREME COURT PRECEDENTS] 112, 125, 132 (1998)).

<sup>103</sup> *Id.* at 297.

<sup>104</sup> *Id.*

second requirement, “ease of interchangeability,” requires that a person of ordinary skill in the art would have easily conceived of the interchangeability.<sup>105</sup>

In 1998, the Japanese courts for the first time acknowledged protection for non-literal infringement in *THK Co. v. Tsubakimoto Seiko Co. (Ball Spline)*.<sup>106</sup> The court held that even if elements differed between the claim and the allegedly infringing product, the allegedly infringing product would nonetheless fall within the technical scope of the patented invention if the elements were “equivalent.”<sup>107</sup> In order for the court to find two elements “equivalent,” five requirements must be met: (1) the variant element must not be an “essential element in the patented invention;”<sup>108</sup> (2) the invention must be able to achieve the same effects and obtain the same results after substitution of the variant element;<sup>109</sup> (3) those skilled in the art must have been capable of readily conceiving the substitution at the time of manufacture;<sup>110</sup> (4) the accused product must not be the same as prior art, and could not have been easily conceived by a skilled artisan at the time of filing;<sup>111</sup> and (5) there must be no special considerations, for example, where the accused product was purposefully excluded from the claims.<sup>112</sup>

The most important and controversial requirement of the Japanese test is the first requirement, which excludes “essential elements in the patented

---

<sup>105</sup> *Id.*

<sup>106</sup> Saikō Saibansho [Sup. Ct.] Feb. 24, 1998 (*Ball Spline*), 1994 (O) no. 1083, 52 SAIKŌ SAIBANSHO MINJI HANREISHŪ [MINSHŪ] 113, 113, <http://www.courts.go.jp> (Japan). This requirement is similar to the pre-*Ball Spline* requirement of an identical “underlying technological idea.” See Pumfrey et al., *supra* note 64, at 299 (citing Mimura, *supra* note 102, at 140 n.4).

<sup>107</sup> *Ball Spline*, 52 SAIKŌ SAIBANSHO MINJI HANREISHŪ [MINSHŪ] at 113.

<sup>108</sup> *Id.*

<sup>109</sup> *Id.*

<sup>110</sup> *Id.* These second and third requirements correlate with the pre-*Ball Spline* “interchangeability” and “ease of interchangeability” requirements, and have been likened to the United States’ function-way-result test, absent the “way” component of the test. See Pumfrey et al., *supra* note 64, at 299 (citing Mimura, *supra* note 102, at 140 n.4).

<sup>111</sup> *Ball Spline*, 52 SAIKŌ SAIBANSHO MINJI HANREISHŪ [MINSHŪ] at 113.

<sup>112</sup> *Id.* This step is similar to prosecution history estoppel in the United States.

invention” as potential equivalents.<sup>113</sup> The controversy surrounds the manner in which a court is to define an “essential part” of a patented invention—a concept not clearly discussed in the *Ball Spline* decision.<sup>114</sup> In the wake of the *Ball Spline* decision, several interpretations have been offered by commentators and courts.<sup>115</sup>

One interpretation holds that the “essential part” requirement will be automatically met in nearly all circumstances if the “interchangeability” requirements of the second and third prongs have been met, because an overlap exists in the necessary considerations for each requirement.<sup>116</sup> A literal interpretation of “essential part” would observe what a person of ordinary skill in the art would consider as essential features of the claimed invention, based on the prior art and the specification.<sup>117</sup> An alternative interpretation involves defining an “essential part” based on the pre-*Ball Spline* test: one would focus on the “technological idea” of the claimed invention and the features that result therein.<sup>118</sup>

The Tokyo High Court has held that an “essential part” is the characteristic part that is the core of the technological idea underlying the solution to the technological problem that the specific patented invention seeks to address.<sup>119</sup>

---

<sup>113</sup> *Id.*

<sup>114</sup> Pumfrey et al., *supra* note 64, at 301 n.171 (citing Yoshiaki Nishida, *Shingai Soshō Ni Okeru Kintō No Hourī* [*The Doctrine of Equivalents in Infringement Litigation*], CHITEKI ZAISAN SOSHO HO [INTELL. PROP. L.] 182, 186 (Toshiaki Makino & Toshiaki Iimura eds., 2002)).

<sup>115</sup> Yukio Nagasawa, Professor, Univ. of Tokyo Research Ctr. for Advanced Sci. and Tech., Presentation at the AIPLA Annual Meeting: The Recent Changes of the Doctrine of Equivalent in Japan – Essential Part of the Invention (1st Requirement) 7-12 (Oct. 14, 2004).

<sup>116</sup> Toshiko Takenaka, *Osaka District Court Found Infringement Under the Doctrine of Equivalents*, 6 CASRIP Newsl., no.1, Summer 1999, available at <http://www.law.washington.edu/Casrip/Newsletter/default.aspx?year=1999&article=newsv6i1jp1>.

<sup>117</sup> Pumfrey et al., *supra* note 64, at 301 (citing Nishida, *supra* note 114, at 192).

<sup>118</sup> *Id.* at 301-02 (citing Nishida, *supra* note 114, at 193).

<sup>119</sup> *Id.* at 302 n.176 (citing *Seisakusyo v. Fulta Electric Machinery*, 1738 HANREI-JIHO 97 (Tokyo High Court, Oct. 26, 2000)).

The court instructed that, rather than look narrowly at the claim, one should look at the characteristic principle underlying the means to solve the problem in comparison to the prior art. One should then decide whether the principle of the means of the accused device conforms substantially to an identical principle underlying the patented invention.<sup>120</sup>

The Tokyo High Court's test for "essential part" has been criticized as being inherently contradictory; the first prong requires an element-by-element approach, whereas the second prong dictates an approach in which one considers the invention as a whole.<sup>121</sup> Likewise, the first prong's element-by-element approach seems to contradict the core focus underlying the entire "essential part" inquiry.<sup>122</sup> Today, the most relied upon definition seems to be based on the element-by-element approach found in the Tokyo High Court case; however, the theoretical inconsistencies have caused a "strange mixture of the 'essential part' doctrine."<sup>123</sup>

#### D. Comparative Analysis

Although the tests for equivalency have evolved uniquely in the courts of each jurisdiction, each jurisdiction's approach converges on the principle of "interchangeability"—whether the accused element is interchangeable with the claimed element such that the invention is not substantially or materially changed.<sup>124</sup> Nevertheless, as applied, the doctrines of each nation permit

---

<sup>120</sup> *Id.* at 302 n.177 (citing *Seisakusyo*, 1738 HANREI-JIHO at 98).

<sup>121</sup> *Id.* at 302 n.180-81 (citing BESSATSU JURISUTO 152-63 (Nobuhiro Nakayama et al. eds., 3d ed. 2004)).

<sup>122</sup> *See id.* at 299.

<sup>123</sup> *Id.* at 304.

<sup>124</sup> *See Graver Tank II*, 339 U.S. 605, 608-09 (1950) ("interchangeability" can be used as a criterion for determining whether a given element was "equivalent," that is: "whether persons reasonably skilled in the art would have known of the interchangeability of an ingredient not contained in the patent with one that was."); *Improver Corp. v. Remington Consumer Prods. Ltd.*, [1990] F.S.R. 181, 192-194 (Pat.Ct. 1989) (holding that the substituted element must have "no material effect on the invention's manner of operation"); *Cutting Blade I*, 33 INT'L REV. OF INDUS. PROP. & COPYRIGHT L. 873, 875-76 (2002) (defining equivalence in-part by whether the substituted element has "objectively the same technical effect"); *Ball Spline*, 1994 (O) no. 1083, 52 SAIKŌ SAIBANSHO MINJI HANREISHŪ [MINSHŪ] 113, 113 (These second

equivalents to fall within the patent scope with different degrees of inclusiveness. The United States is the most inclusive, followed by Japan, then Germany, and the United Kingdom is the least inclusive of the four. Defining equivalence is only one part of the doctrine, however, and this Note will later discuss other limitations imposed by each jurisdiction that ultimately bring their doctrines closer together.<sup>125</sup>

### 1. Convergence Toward Interchangeability

The concept of interchangeability is expressly recognized in the United States, where the Supreme Court has noted that a key aspect of the equivalency analysis is “whether persons reasonably skilled in the art would have known of the interchangeability of an ingredient not contained in the patent with one that was,”<sup>126</sup> and the Federal Circuit has stated that “known interchangeability is often synonymous with equivalence.”<sup>127</sup> Japan also expressly recognizes interchangeability as a key component of the invention; the second and third prong of the *Ball Spline* test look to “interchangeability” and “ease of interchangeability,” respectively.<sup>128</sup>

The United Kingdom’s “purposive construction” test implicitly addresses interchangeability by focusing on whether one skilled in the art “told of both the invention and the variant,” would recognize that the elements at issue were interchangeable.<sup>129</sup> Likewise, the German test implicitly invokes interchangeability by focusing on whether the allegedly infringing device “solve[s] the problem underlying the invention with modified but objectively equivalent means.”<sup>130</sup>

---

and third requirements correlate with the pre-*Ball Spline* “interchangeability” and “ease of interchangeability”).

<sup>125</sup> See discussion *infra* Part V.

<sup>126</sup> *Warner-Jenkinson Co. v. Hilton Davis Chemical Co.*, 520 U.S. 17, 25 (1997).

<sup>127</sup> *Litton Sys. v. Honeywell, Inc.*, 140 F.3d 1449, 1465 (Fed. Cir. 1998).

<sup>128</sup> *Ball Spline*, 52 SAIKŌ SAIBANSHO MINJI HANREISHŪ [MINSHŪ] at 113.

<sup>129</sup> *Improver*, [1990] F.S.R. at 192-93.

<sup>130</sup> *Cutting Blade I*, 33 IIC 873, 875 (2002) (“[M]odified but objectively equivalent means” has been interpreted as “means which have objectively the same technical effect.”); see *Pumfrey et al.*, *supra* note 64, at 291.



## 2. Practical Application of Interchangeability

Despite a convergence toward interchangeability, the application of each jurisdiction's equivalency analysis yields considerable practical differences. The United States arguably approaches the analysis most broadly, both under the function-way-result test and under the insubstantial differences test, which allow all equivalents that are "substantially the same."<sup>131</sup> The Japanese test also allows for a wide range of equivalents, yet the additional prohibition of "essential part[s]" from the range of eligible equivalents results in a stricter application than in the United States.<sup>132</sup>

Both the United Kingdom and Germany, operating under the direction of the EPC, are more restrictive than the United States and Japan in requiring that the equivalents arise directly from the language of the claim.<sup>133</sup> Yet the two doctrines diverge slightly.

The modern United Kingdom "purposive construction" analysis is distinct from the United States' and other jurisdictions' analyses, where equivalents need not necessarily fit within the language of the claim.<sup>134</sup> Words in

---

<sup>131</sup> Pumfrey et al., *supra* note 64, at 304.

<sup>132</sup> *Ball Spline*, 52 SAIKŌ SAIBANSHO MINJI HANREISHŪ [MINSHŪ] at 113. Notably, the "essential part" requirement is in some ways similar to the test in *Catnic Components Ltd. v. Hill & Smith Ltd.*, where the court held that if an allegedly infringing device "is lacking . . . an essential feature of the claim, there will be no infringement" but "if it has all the essential features of the claim, it will infringe the claim notwithstanding the omission or substitution of an inessential feature." *Catnic Components Ltd. v. Hill & Smith Ltd.*, [1982] R.P.C. 183, 225 (H.L.).

<sup>133</sup> See Protocol on the Interpretation of Article 69 of the Convention, *supra* note 33, art. 1 ("[N]ot . . . [so] that the extent of the protection conferred by a European patent is . . . defined by the strict, literal meaning of the wording used in the claims . . . [but] [n]either should it be interpreted . . . [so] that the claims serve only as a guideline . . . . On the contrary, it is to be interpreted as defining a position between these extremes which combines a fair protection for the patentee with a reasonable degree of certainty for third parties."); Patents Act, 1977, c.37, § 125 (Eng.) (providing the only instance in which the claim scope can stretch beyond the literal terms of the claims, occurring "[w]here the literal meaning of a term used in the claim is clear, however when one looks to the specification and drawings, another meaning occurs").

<sup>134</sup> Pumfrey et al., *supra* note 64, at 276-77.

the claim can be interpreted figuratively and can be deemed characteristics, attributes, genera, or species of the term used, but the interpretation cannot depart from the claim language.<sup>135</sup> The United Kingdom's approach uses an interchangeability analysis similar to the United States' approach, asking whether one skilled in the art and "told of both the invention and the variant" would recognize the interchangeability of the elements at issue.<sup>136</sup> But, unlike the United States' approach, the United Kingdom's analysis is limited by claim language.

The United Kingdom's "purposive construction" analysis has been criticized as utilizing an overly strict interpretation and putting too much of a burden on claim drafters.<sup>137</sup> Additionally, similar to the "function-way-result" test of the United States, the *Catnic* analysis has drawn criticism for focusing on the "way" the invention operates, which can be inappropriate for some fields, such as in chemical or biotechnological processes where the precise "way" that the invention arrives at its result is unknown.<sup>138</sup>

The German doctrine is very similar to the doctrine of the United Kingdom, but focuses on the *result* achieved by the invention, and not merely the elements that comprise it or the manner in which the invention works.<sup>139</sup> For example, the first question of the German analysis, whether the varied embodiment "solve[s] the problem underlying the invention with modified but objectively equivalent means,"<sup>140</sup> is similar to the first *Improver* question<sup>141</sup> because it focuses on the purpose or the problem solved by the invention. But the

---

<sup>135</sup> Pumfrey, *supra* note 15, at 6-7.

<sup>136</sup> *Improver Corp. v. Remington Consumer Prods. Ltd.*, [1990] F.S.R. 181, 192-93 (Pat.Ct.).

<sup>137</sup> See Ralston, *supra* note 54, at 185-86.

<sup>138</sup> *Id.* at 186-187; see Case T 0892/94, 2000 O.J. EPO 116, 116 (Boards of Appeal of the European Patent Office Jan. 19, 1999) (discussing the novelty of a deodorant invention comprised of aromatic esters that inhibited certain microorganisms of the skin, and concluding that novelty did not require knowledge of the invention's function, i.e., the "way" the invention worked).

<sup>139</sup> Pumfrey et al., *supra* note 64, at 294.

<sup>140</sup> *Cutting Blade I*, 33 IIC 873, 875 (2002); see Pumfrey et al., *supra* note 64, at 291.

<sup>141</sup> *Improver*, [1990] F.S.R. at 182 ("Does the variant have a material effect upon the way the invention works?").

first question of the German analysis is also unique because it does not focus on “the way the invention works.”<sup>142</sup> The German standard for whether the modified means obtain the intended result of the invention focuses on what a person of ordinary skill in the art is able to obtain *specifically from the patent claim*, but not the specification or the prior art.<sup>143</sup> This focus on the words of the patent claim reflects the United Kingdom’s approach, but allows a more liberal interpretation that incorporates the “technical effect” or result of the invention.<sup>144</sup>

In sum, the United Kingdom applies perhaps the most exclusive characterization of “an equivalent,” followed closely by Germany. The Japanese approach is far more inclusive than the approaches of the United Kingdom and Germany, and the United States is even more inclusive than Japan. In addition, in order to supplement the definition of “equivalence,” each of these jurisdictions has adopted restrictions regarding aspects such as the timing of the equivalency analysis, the foreseeability of equivalents, and the prosecution history. These restrictions further limit both the application of the doctrine of equivalents and the patent scope.

#### IV. TIMING FOR EQUIVALENCY ANALYSIS AND COVERAGE OF UNFORESEEABLE EQUIVALENTS

Although the definition of “equivalence” shares many similarities from one nation to the next, there has been significantly less consensus on the appropriate time around which the court should orient its doctrine of equivalence analysis. Differences among the jurisdictions reflect the outcome of each jurisdiction’s balancing of the need to protect inventors from new technologies versus the importance of public notice of patent scope.

##### A. *United States*

In the United States, the test for equivalency is evaluated from the time of infringement or before.<sup>145</sup> Therefore, the scope of equivalent elements might increase as new equivalents are developed or discovered after filing, and the scope of patent protection might grow with time—an approach that is intended to protect an inventor from unforeseen and unforeseeable developments in

---

<sup>142</sup> *Id.*

<sup>143</sup> Pumfrey et al., *supra* note 64, at 294.

<sup>144</sup> *Id.*

<sup>145</sup> Warner-Jenkinson Co. v. Hilton Davis Chemical Co., 520 U.S. 17, 37 (1997).

technology.<sup>146</sup> Additionally, this could allow a patentee to block even those who improve upon his invention, which arguably provides a greater incentive for innovation and less public benefit.<sup>147</sup>

Chief Judge Rader of the Court of Appeals for the Federal Circuit recently proposed the principle of foreseeability as a more straightforward approach to guide courts in applying the doctrine of equivalents.<sup>148</sup> This approach would ensure that only unforeseeable equivalents would fall under the available equivalents.<sup>149</sup> Judge Rader's approach places a heavy burden on the patentee to draft claims that cover all known equivalents at the time of filing, yet it also protects the patentee from unforeseeable equivalents that even flawless claim drafting could not encompass.<sup>150</sup> Despite its advantages, this viewpoint has yet to be accepted by the Supreme Court in applications other than prosecution history estoppel.<sup>151</sup> Ultimately, the United States provides protection for both foreseeable and unforeseeable equivalents, although prosecution history estoppel<sup>152</sup> bars many of those that are foreseeable.

## B. *Japan*

In Japan, the equivalency analysis is also viewed from any time up until or before the time of infringement.<sup>153</sup> The third requirement of the *Ball Spline* test states: "A person who has an average knowledge in the area of technology where [the accused product] belongs could easily come up with the idea of [the accused

---

<sup>146</sup> *Hughes Aircraft Co. v. United States*, 717 F.2d 1351, 1365 (Fed. Cir. 1983).

<sup>147</sup> Toshiko Takenaka, *Doctrine of Equivalents After Hilton Davis: A Comparative Law Analysis*, 22 RUTGERS COMPUTER & TECH. L.J. 479, 516-19 (1996).

<sup>148</sup> *Johnson & Johnston Assocs. v. R.E. Serv. Co.*, 285 F.3d 1046, 1056-58 (Fed. Cir. 2002) (en banc) (Rader, J., concurring).

<sup>149</sup> *See id.*

<sup>150</sup> *See id.*

<sup>151</sup> *See Warner-Jenkinson Co. v. Hilton Davis Chemical Co.*, 520 U.S. 17, 17 (1997).

<sup>152</sup> *See discussion infra* Part V.C.

<sup>153</sup> Takenaka, *supra* note 17, at 5 ("[A] person with ordinary skill in the field of the patented invention would have readily conceived the interchangeability between the claimed portion and the replaced structures in the accused product as of the time of exploitation, such as the manufacturing of the accused product by the accused infringer.").

product] at the time of the production of the products.”<sup>154</sup> The Japanese approach thus allows for both foreseeable and unforeseeable equivalents if the equivalents were interchangeable at the time of manufacture, but this occurs only if the variant is not an essential part of the claim.<sup>155</sup>

### C. United Kingdom

In *Kirin-Amgen*, Lord Hoffman noted that “proper construction” of a claim can “cover products or processes which involve the use of technology *unknown at the time the claim was drafted*,” but only if the claim is sufficiently general to include variants that employ such after-arising technology.<sup>156</sup> The purposive construction analysis, however, requires an inquiry as to whether a person of ordinary skill in the art would have found it obvious that the variant would have no material effect on the invention *at the time of publication of the patent*.<sup>157</sup> Therefore, the person skilled in the art is to construe the claim on the date of publication of the patent, and cannot use after-arising technology to construe the claim in question.<sup>158</sup>

As a result, depending on the breadth of the language of the claim, courts in the United Kingdom might find unforeseeable, after-arising technology incorporated in the claim.<sup>159</sup> Nevertheless, if a particular variant, foreseeable or unforeseeable, is not encompassed by the scope of the claim language, it cannot be found to be an equivalent.<sup>160</sup>

---

<sup>154</sup> See *Ball Spline*, 1994 (O) no. 1083, 52 SAIKŌ SAIBANSHO MINJI HANREISHŪ [MINSHŪ] 113, 113.

<sup>155</sup> *Id.*

<sup>156</sup> *Kirin-Amgen Inc. v. Hoechst Marion Roussel Ltd.*, [2005] 1 All E.R. 667, 692 (H.L.) (emphasis added).

<sup>157</sup> *Catnic Components Ltd. v. Hill & Smith Ltd.*, [1982] R.P.C. 183, 225 (H.L.); *Improver Corp. v. Remington Consumer Prods. Ltd.*, [1990] F.S.R. 181, 189 (Pat.Ct.).

<sup>158</sup> See *Improver Corp.*, [1990] F.S.R. at 189; Pumfrey et al., *supra* note 64, at 279.

<sup>159</sup> See *Improver Corp.*, [1990] F.S.R. at 189.

<sup>160</sup> See *id.*

#### D. *Germany*

In Germany, the test for equivalency is based on the knowledge of one of ordinary skill in the art at the time of priority.<sup>161</sup> The second “*Kunststoffrohrteil*” question requires that “[a] person skilled in the art was able to use his specialist knowledge to identify the modified means as having the same effect.”<sup>162</sup> Thus, the German doctrine does not incorporate unforeseeable equivalents because a person of ordinary skill in the art does not know such substitutes at the priority date of the invention.<sup>163</sup>

#### E. *Comparative Analysis*

Both the United Kingdom and Germany provide less protection to patentees than either the United States or Japan, allowing subsequent inventors to develop improvements and exploit inventions as long as improvements use previously unknown substitutes.<sup>164</sup> Germany is stricter than the United Kingdom. In Germany, equivalents become absolutely fixed at a certain point in time, regardless of whether a person of ordinary skill in the art at the time of publication of the patent would have foreseen the equivalency.<sup>165</sup> The allowance of foreseeable equivalents is an area of variance among the various jurisdictions, and it reflects complex cultural and political determinations about fairness and the promotion of innovation.<sup>166</sup>

### V. **LIMITATIONS ON THE DOCTRINE OF EQUIVALENTS IN THE UNITED STATES MAKE THE DOCTRINE SUBSTANTIALLY SIMILAR TO OTHER JURISDICTIONS**

The United States takes a unique approach to balancing the interests of the patentee and the interests of the public, and has supplemented its broad definition of “equivalence” with four legal tenets that bar the application of the doctrine of equivalents in certain circumstances. First, the doctrine of equivalents cannot enlarge the patent’s metes and bounds.<sup>167</sup> Second, the doctrine cannot

---

<sup>161</sup> *Cutting Blade I*, 33 IIC 873, 874 (2002).

<sup>162</sup> *Id.*

<sup>163</sup> Meier-Beck, *supra* note 16, at 7.

<sup>164</sup> *See infra* Part V.

<sup>165</sup> Meier-Beck, *supra* note 16, at 7.

<sup>166</sup> Takenaka, *supra* note 147, at 516.

<sup>167</sup> *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 29-30 (1997).

eliminate any claimed elements.<sup>168</sup> Third, the doctrine cannot permit the patentee to recapture material surrendered in a prior application (prosecution history estoppel). Fourth, the doctrine cannot permit the patentee to capture something that was disclosed in the specification but not claimed.<sup>169</sup> In the United Kingdom, Germany, and Japan many of these limitations are either built into the determination of an “equivalent” or effected by limiting when “equivalence” is determined.<sup>170</sup> Ultimately, the limitations on the United States’ broad doctrine create a substantially similar application of non-literal infringement.

#### A. *Prohibition on Enlarging the Patent’s Metes and Bounds*

It is well settled in United States jurisprudence that the addition of an equivalent cannot “enlarge the metes and bounds of the invention” beyond what is claimed.<sup>171</sup> Courts determine whether a substitution has impermissibly enlarged the metes and bounds of the invention in a somewhat circular manner, by finding that the scope is not enlarged if the courts do not go beyond the substitution of equivalent elements.<sup>172</sup> This limitation brings the United States’ broad definition of “equivalent” closer to that applied in the European analysis, which requires that the equivalent be found in the language of the claim.<sup>173</sup> Nevertheless, the prohibition of equivalents that enlarge the metes and bounds of an invention is arguably much less restrictive than the requirement that the equivalent be found in the language of the claim. Japan does not presently express such a requirement, focusing instead on “essential” elements to ensure that the breadth of the patentee’s rights remain within its current metes and

---

<sup>168</sup> *See id.* (indicating that each element must not be construed so as to eliminate an “element in its entirety,” and that the test for equivalents must be applied to each individual element and not to the claim as a whole); *Autogiro Co. of Am. v. United States*, 384 F.2d 391, 392 (Ct. Cl. 1967); *Pennwalt Corp. v. Durand-Wayland, Inc.*, 833 F.2d 931, 952 (Fed. Cir. 1987) (restating that all elements must be present in the infringing device, and that the test should not be applied to the invention as a whole).

<sup>169</sup> *Festo I*, 234 F.3d 558, 566 (Fed. Cir. 2000).

<sup>170</sup> For example, the United Kingdom defines equivalence such that the substituted element must be within the “primary, literal or contextual meaning” of the word or phrase in question. *Improver Corp. v. Remington Consumer Prods. Ltd.*, [1990] F.S.R. 181, 182 (Pat.Ct.).

<sup>171</sup> *Warner-Jenkinson*, 520 U.S. at 29-30.

<sup>172</sup> *Id.*

<sup>173</sup> Convention on the Grant of European Patents, *supra* note 33, art. 69.

bounds.<sup>174</sup> Additionally, the fifth *Ball Spline* requirement grants the Japanese Court the power to deny coverage of an equivalent if “the accused product and the like are intentionally excluded from the scope of the claim during patent prosecution.”<sup>175</sup> This open-ended grant of power provides an alternative means for the Japanese Court to ensure that the asserted equivalent remains within the invention’s metes and bounds.<sup>176</sup>

### B. “All Elements” Rule

Under the “all elements” rule, the United States deems material “all elements” of a patent claim and does not allow the doctrine of equivalents to be applied in a manner that “effectively eliminate[s] an element in its entirety.”<sup>177</sup> In other words, all elements of the invention must remain present.<sup>178</sup> The insubstantial differences inquiry often renders the all elements rule superfluous, especially given the Federal Circuit’s distinction between “element” and “component” in allowing substitutions that eliminate components of an invention yet preserve the same limitations.<sup>179</sup>

---

<sup>174</sup> Pumfrey et al., *supra* note 64, at 299.

<sup>175</sup> See Yoichiro Kawashimo & Toshiko Takenaka, *File Wrapper Estoppel and the Doctrine of Equivalents in Japanese Courts*, 7 CASRIP NEWSL., no. 2, 2000, at 12.

<sup>176</sup> Pumfrey et al., *supra* note 64, at 299.

<sup>177</sup> *Warner-Jenkinson*, 520 U.S. at 29-30 (indicating that each element must not be so construed as to eliminate an “element in its entirety,” and that the test or equivalents must be applied to each individual element and not to the claim as a whole); *Autogiro Co. of Am. v. United States*, 384 F.2d 391, 403 (Ct. Cl. 1967); *Pennwalt Corp. v. Durand-Wayland, Inc.*, 833 F.2d 931, 959 (Fed. Cir. 1987) (Newman, J., dissenting) (restating that all elements must be present in the infringing device, and that the test should not be applied to the invention as a whole).

<sup>178</sup> *Warner-Jenkinson*, 520 U.S. at 29-30.

<sup>179</sup> *Corning Glass Works v. Sumitomo Elec. U.S.A., Inc.*, 868 F.2d 1251, 1259 (Fed. Cir. 1989) (“‘Element’ may be used to mean a single limitation, but it has also been used to mean a series of limitations which, taken together, make up a component of the claimed invention. In the All Elements rule, “element” is used in the sense of a *limitation* of a claim . . . [Respondent’s] analysis is faulty in that it would require equivalency in components, that is, the substitution of something *in the core* for the absent dopant. However, the determination of equivalency is not subject to such a rigid formula. An equivalent must be found for every limitation of the claim somewhere in an



The United Kingdom, Germany, and Japan utilize an all elements requirement in an almost identical manner. The United Kingdom precludes any equivalent with less than all claim elements through the third *Improver* question, which requires that one skilled in the art, reading the language of the claim, would not have understood that the patentee intended strict compliance with the primary meaning of the claim as an essential element.<sup>180</sup> Similarly, Germany's definition of equivalency incorporates the all elements rule through the third *Kunststoffrohrteil* question, which requires that the skilled artisan's equivalency analysis be drawn from the technical teachings of claim elements.<sup>181</sup> Lastly, the Japanese doctrine incorporates the all elements rule through the first prong of the *Ball Spline* test, which directs an element-by-element approach to ensure that "the part which is different from the products . . . is not the essential part of the patented invention."<sup>182</sup>

### C. *Infringement by Disclaimed Embodiments*

There is consistency among nearly all jurisdictions in the policy that disclaimed embodiments should not be within the scope of the doctrine of equivalents. Nevertheless, the jurisdictions disagree about whether courts should consider a patent's prosecution history in determining the scope of the doctrine.

In the United States, prosecution history estoppel and the dedication doctrine govern the prohibition of disclaimed embodiments.<sup>183</sup> The application of

---

accused device, but not necessarily in a corresponding component, although that is generally the case.").

<sup>180</sup> *Improver Corp. v. Remington Consumer Prods. Ltd.*, [1990] F.S.R. 181, 189 (Pat.Ct.).

<sup>181</sup> *Cutting Blade I*, 33 IIC 873, 875 (2002); Meier-Beck, *supra* note 16, at 6-7 (Accused infringing device must contain "every single feature and . . . the mutual connection of all features of the claim.").

<sup>182</sup> *Ball Spline*, 1994 (O) no. 1083, 52 SAIKŌ SAIBANSHO MINJI HANREISHŪ [MINSHŪ] 113, 113; Toshiko Takenaka, *Harmonizing the Japanese Patent System with Its U.S. Counterpart Through Judge-Made Law: Interaction Between Japanese and U.S. Case Law Developments*, 7 PAC. RIM L. & POL'Y J. 249, 252-53 (1998) (Japan applies the "all elements" rule).

<sup>183</sup> *See, e.g., Festo II*, 535 U.S. 722, 731 (2002) (recognizing that prosecution history estoppel limits the reach of the doctrine of equivalents); *Johnson & Johnston Assocs. v. R.E. Serv. Co.*, 285 F.3d 1046, 1054 (Fed. Cir. 2002) (en banc) (Rader, J., concurring) (noting that a patentee cannot recapture that

the doctrine of equivalents is premised on the inability of language to capture the essence of innovation.<sup>184</sup> This underlying premise would be weakened if the applicant described the precise element at issue in a prior application (prosecution history estoppel) or in the specification (dedication doctrine).<sup>185</sup> Both of these doctrines emphasize well-drafted claims and a precise delineation of the exclusive right.<sup>186</sup>

#### D. *Prosecution History Estoppel*

Prosecution history estoppel is applied when the patentee narrows his claims through amendment, a decision that is “presumed to be a general disclaimer of the territory between the original claim and the amended claim.”<sup>187</sup> This presumption can be rebutted either by showing that the equivalent might have been unforeseeable at the time of the application, or by showing that the rationale underlying the amendment bears no more than a tangential relation to the equivalent in question.<sup>188</sup> The patentee also can rebut the presumption if there is some other reason why he could not reasonably be expected to have described the substitute in question.<sup>189</sup>

Prosecution history estoppel does not negate protection from unforeseeable equivalents. Instead, it only dedicates to the public equivalents for which the inventor demonstrated clear knowledge.<sup>190</sup> This foreseeability principle currently only applies to the use of prosecution history estoppel; known equivalents that were not part of a narrowing amendment are still

---

which has been disclosed in the specification but not claimed because it has become part of the public domain).

<sup>184</sup> *Festo II*, 535 U.S. at 736.

<sup>185</sup> *See id.* at 733-34, 737.

<sup>186</sup> *See id.* at 733-34, 740 (“The patentee . . . may be expected to draft claims encompassing readily known equivalents.”).

<sup>187</sup> *Id.*

<sup>188</sup> *Id.* at 740.

<sup>189</sup> *Id.* at 740-41.

<sup>190</sup> *Id.*

permissible because “equivalents” includes all known elements, even those known at the time of filing.<sup>191</sup>

In Japan, the rationale for prosecution history estoppel is based on notice policy: “if a patentee were allowed to act one way and assert the opposite later on, it would unreasonably invade the interests of third parties who believed the patentee’s previous acts.”<sup>192</sup> Thus, estoppel applies when a patentee admits or acts as if terms are outside the claim scope.<sup>193</sup>

By contrast, the United Kingdom does not utilize prosecution history estoppel.<sup>194</sup> Instead, the United Kingdom, under its purposive construction analysis, focuses on claim language to determine if the patentee indicated that certain embodiments are outside the scope of the claim.<sup>195</sup> Similarly, Germany does not address prosecution history estoppel,<sup>196</sup> reasoning that Article 69 of the EPC does not mention file history as a means of interpretation and prohibits the use of extraneous material.<sup>197</sup> Additionally, German courts have held that there is no practical need to consider events that took place during the grant procedure, given the German application process.<sup>198</sup> If an equivalent solution is not

---

<sup>191</sup> See *Vulcan Eng’g Co. v. FATA Aluminum, Inc.*, 278 F.3d 1366, 1374 (Fed. Cir. 2002) (citing *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 19 (1997)).

<sup>192</sup> See *Kawashimo & Takenaka*, *supra* note 175, at 11.

<sup>193</sup> See *id.*

<sup>194</sup> John Lambert & Alex Khan, Comment: *Merck & Co., Inc. v. Generics (UK) Ltd.*, 26 EUR. INTEL. PROP. REV. 361, 364-65 (2004) (noting that provisions for prosecution history estoppel were proposed as amendments to the EPC, but were eventually dropped).

<sup>195</sup> See *Improver Corp. v. Remington Consumer Prods. Ltd.*, [1990] F.S.R. 181, 189 (Pat.Ct.) (part of the *Catnic* test is whether “the reader skilled in the art . . . [would] have understood from the language of the claim that the patentee intended that strict compliance with the primary meaning [of the claim language] was an essential requirement of the invention.”).

<sup>196</sup> See *Meier-Beck*, *supra* note 16, at 8-9.

<sup>197</sup> See *Plastic Pipe*, 34 IIC 302, 303 (2003); *Meier-Beck*, *supra* note 16, at 9.

<sup>198</sup> See *Plastic Pipe*, 34 IIC at 307 (noting that only direct subject matter of a patent application is evaluated for patentability by the German Patent Office, adequate scope of protection in light of the state of the art is not included in the evaluation).

patentable in view of state of the art, the “*Formstein* objection” prevents patentees from receiving protection.<sup>199</sup>

### E. *The Dedication Doctrine*

Similar to prosecution history estoppel, the dedication doctrine excludes from the field of equivalents anything disclosed in a specification but not claimed. The rationale behind the dedication doctrine is that such equivalents are part of the public domain and hence dedicated to the public.<sup>200</sup> The dedication doctrine is based on the United States’ infringement inquiry, which compares the accused product to the claims of the patent, because the applicant is required to define the bounds of his invention within the claims rather than in the specification.<sup>201</sup>

Application of the doctrine of equivalents to subject matter disclosed in the specification but left unclaimed would conflict with the primacy of claims in defining the scope of a patentee’s exclusive right. This could allow a patentee to claim narrowly to bypass patentability inquiries at the United States Patent and Trademark Office, and then use the doctrine of equivalents to broaden his exclusive right after the patent issued.<sup>202</sup>

Japan has also adopted the prohibition on including disclaimed subject matter as an “equivalent.”<sup>203</sup> Japanese courts will typically exert this restriction

---

<sup>199</sup> Moulded Curbstone, 18 IIC 795, 800 (1987).

<sup>200</sup> *Winans v. Denmead*, 56 U.S. 330, 346 (1853) (“[T]he patentee may so restrict his claim as to cover less than what he invented, or may limit it to one particular form of machine, excluding all other forms, though they also embody his invention . . .”); *Johnson & Johnston Assocs. v. R.E. Serv. Co.*, 285 F.3d 1046, 1054 (Fed. Cir. 2002) (“[W]hen a patent drafter discloses but declines to claim subject matter . . . this action dedicates that unclaimed subject matter to the public. Application of the doctrine of equivalents to recapture subject matter deliberately left unclaimed would ‘conflict with the primacy of the claims in defining the scope of the patentee’s exclusive right.’”).

<sup>201</sup> See *Johnson & Johnston*, 285 F.3d at 1056.

<sup>202</sup> See *id.*

<sup>203</sup> Japan initially declined to codify prosecution history estoppel within its patent act, but the Osaka High Court and the Japanese Supreme Court eventually adopted the doctrine. See Toshiko Takenaka, *New Policy in Interpreting Japanese Patents: Osaka High Court Affirms Infringement of*

under the fifth requirement of the *Ball Spline* analysis, which allows a court to deny coverage of an equivalent if there are “special circumstances such that the accused product and the like are intentionally excluded from the scope of the claim during patent prosecution.”<sup>204</sup>

The United Kingdom and Germany take a different approach to the dedication doctrine. Courts in the United Kingdom, using the purposive construction analysis, focus on the language of a claim in determining whether the patentee indicated that certain embodiments are outside the scope of the claim.<sup>205</sup> Like the United Kingdom, Germany does not address dedication.<sup>206</sup> The nature of the German application process removes the need to consider events that took place during the grant procedure.<sup>207</sup> The “*Formstein* objection” prevents patentees from receiving protection if an equivalent solution is not patentable in view of the state of the art.<sup>208</sup> This brings Germany more closely in line with Article 69 of the EPC, which prohibits the use of extraneous material and does not mention file history as a means of interpretation.<sup>209</sup>

#### F. *Comparative Analysis of the Use of Prosecution History Estoppel and the Dedication Doctrine*

The United States’ doctrine of prosecution history estoppel has been criticized as overly harsh because it excludes known equivalents from the scope of patent infringement, weakening the use of the doctrine as a means to cope

---

*Genetech’s t-PA Patents Under the Doctrine of Equivalents*, 3 CASRIP NEWSL., no. 2, 1996, at 7.

<sup>204</sup> See Kawashimo & Takenaka, *supra* note 175, at 12.

<sup>205</sup> See *Improver Corp. v. Remington Consumer Prods. Ltd.*, [1990] F.S.R. 181, 189 (Pat.Ct.) (part of the *Catnic* test is whether “the reader skilled in the art . . . [would] have understood from the language of the claim that the patentee intended that strict compliance with the primary meaning [of the claim language] was an essential requirement of the invention.”).

<sup>206</sup> See Meier-Beck, *supra* note 16, at 8-9.

<sup>207</sup> See *Plastic Pipe*, 34 IIC 302, 307 (2003) (noting that only direct subject matter of a patent application is evaluated for patentability by the German Patent Office, adequate scope of protection in light of the state of the art is not included in the evaluation).

<sup>208</sup> *Moulded Curbstone*, 18 IIC 795, 800 (1987).

<sup>209</sup> See *Plastic Pipe*, 34 IIC at 303; Meier-Beck, *supra* note 16, at 9.

with the imperfections of language.<sup>210</sup> These criticisms are supported by the high percentage of patents that are amended during prosecution in the United States.<sup>211</sup> Nevertheless, this limitation brings the doctrines of the United States and Japan closer to the stricter applications of the United Kingdom and Germany by limiting the range of equivalents based upon the literal language of the eventual claim. The doctrines of Germany and the United Kingdom arguably remain significantly more restrictive than the doctrines of the United States and Japan. In the United States and Japan, equivalents outside the claim language can be included as long as they are not expressly disclaimed at some point. By contrast, Germany and the United Kingdom prevent inclusion of these equivalents through a claim language-focused definition of “equivalent.”

In sum, the prohibition on enlarging a patent's metes and bounds, the “all elements” rule, prosecution history estoppel, and the dedication doctrine all significantly limit the application of the United States’ doctrine of equivalents in ways that balance the competing objectives of the doctrine. If coupled with the United States’ broad definition of “equivalent,” the tenets ultimately result in a doctrine that is substantially in line with the doctrines of the United Kingdom, Germany, and Japan.

## VI. CONCLUSION

In implementing the doctrine of equivalents, each jurisdiction seeks a rule that fairly balances the competing interests of the patentee and the public, and seeks to draft that rule in a way that provides public notice as to the metes and bounds of the patentee’s right to exclude. Although the jurisdictions have developed facially distinct doctrines of equivalents, a comparative analysis shows that the combination of the way that a jurisdiction defines “equivalent” and the limitations placed on the available equivalents result in doctrines that are remarkably similar.

The United States defines “equivalents” broadly, compared to other jurisdictions, but it also uses several limitations that bar certain groups of

---

<sup>210</sup> See *Johnson & Johnston Assocs. v. R.E. Serv. Co.*, 285 F.3d 1046, 1057 (Fed. Cir. 2002) (arguing that a foreseeability bar would effectively place a premium on notice and force claim drafters to draft claims that capture all reasonably foreseeable ways to practice the invention while preserving the protective function that is made necessary by the difficulty of describing things with words).

<sup>211</sup> *Festo I*, 234 F.3d 558, 638 n.3. (Fed. Cir. 2000).

equivalents. As a result, the United States' doctrine of equivalents has a narrower application that drifts closer to the analyses of the United Kingdom and Germany. Despite these limitations, the doctrines applied in the United Kingdom and Germany remain tied to the language of the claims—a critical distinction that provides slightly more protection to the public than does the United States' application.

Broad applications, such as that of the United States, are occasionally criticized for being unpredictable and for obscuring the boundaries of a claim. Yet it is also possible to argue that relying on the claim language as the determining factor of equivalency places an undue burden on the drafter and can result in unfair violations of the patentee's right to exclude.

A broader application of the doctrine of equivalents with specific limitations—such as those in the United States—might be preferable because it rewards the patentee with greater protection, yet limits that protection to the circumstances in which the public is most likely to be harmed. The recent implementation of a first-to-file system in the United States under the America Invents Act gives additional import to rapid filing and pre-filing secrecy, and further justifies patentee protection through flexibility in the inclusion of equivalents in the patentee's right to exclude.

Each jurisdiction's doctrine reflects distinct cultural and historical values and unique perspectives on how to best drive innovation. As a result, it is unlikely that the doctrines of equivalents will have identical language and structure across jurisdictions. Yet the doctrines of each jurisdiction are quite similar in practice. As a result, the modern international practitioner can operate in each nation with a confident understanding of the consistency that exists among the doctrines of each jurisdiction.