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What is the "Invention"?

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WHAT IS THE “INVENTION”?

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ABSTRACT

Patent law is in flux, with recent disputes and changes in doctrine fueled by increased attention from the Supreme Court and en banc activity by the Federal Circuit. The natural reaction is to analyze each doctrinal area involved on its own. Upon a closer look, however, many patent cases concern a single, fundamental dispute. Conflicts in opinions on such issues as claim interpretation methodology and the written description requirement are really disagreements over which “invention” the courts should be considering.

There are two concepts of invention currently in play in patent decisions. The first is an “external invention” definition, in which courts define the invention by the detailed technology discussion in the patent specification’s descriptions and drawings. Other decisions invoke a “claim-centered invention” definition, which relies almost exclusively on the claim, a single sentence at the end of the patent. Judging these two definitions against common patent theories can

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help to determine which best fits the theories' narratives. This Article concludes that the external invention is more favorable because it grounds exclusivity in what the inventor has actually done or plans to do and, accordingly, is more likely to comport with common patent theories.

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INTRODUCTION

Patent law has changed dramatically over the past ten years. The Supreme Court is now more active than it once was in reviewing patent cases.¹ The Federal Circuit goes en banc more frequently in attempts to resolve disconnects in doctrine or simply to clarify them.² These disputes and changes impact all aspects of patent law. Each is interesting in its own right and prompts much discussion among patent scholars.³ The presence of so many conflicts and changes in patent doctrine raises the question of whether these disputes share a common theme. Is there an underlying fundamental disagreement in patent law?

This Article contends that there is. The discourse in various doctrinal areas revolves around a single question—what is the “invention”?⁴ The concept of invention sits at the center of patent

1. See, e.g., *Bilski v. Kappos*, 130 S. Ct. 3218 (2010) (discussing the patentable subject matter requirement); *KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398 (2007) (reversing the Federal Circuit's nonobviousness standard); *eBay Inc. v. MercExchange, L.L.C.*, 547 U.S. 388 (2006) (considering the requirements for a patent injunction); see also Mark D. Janis, *Patent Law in the Age of the Invisible Supreme Court*, 2001 U. ILL. L. REV. 387, 387-88 (discussing the absence of Supreme Court review of Federal Circuit decisions from the Federal Circuit's inception in 1982).

2. See, e.g., *Therasense, Inc. v. Becton, Dickinson & Co.*, 649 F.3d 1276 (Fed. Cir. 2011) (en banc) (considering inequitable conduct doctrine); *Akamai Techs., Inc. v. Mass. Inst. of Tech.*, 419 F. App'x 989 (Fed. Cir. 2011) (en banc) (discussing divided infringement claims); *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336 (Fed. Cir. 2010) (en banc) (determining the scope and purpose of the written description requirement); *In re Bilski*, 545 F.3d 943 (Fed. Cir. 2008) (en banc) (discussing patentable subject matter).

3. See, e.g., Symposium, *The Future of Patents: Bilski and Beyond*, 63 STAN. L. REV. 1245 (2011) (containing articles on the Supreme Court's *Bilski* decision and the state of patentable subject matter in patent law); Symposium, *Nonobviousness—The Shape of Things to Come*, 12 LEWIS & CLARK L. REV. 323 (2008) (discussing the Supreme Court's *KSR* decision and the nonobviousness doctrine); John Golden, Commentary, *"Patent Trolls" and Patent Remedies*, 85 TEX. L. REV. 2111 (2007) (examining the *eBay* decision and remedies in patent law).

4. Oskar Liivak is also looking into this fundamental question, although he is approaching it from a constitutional and statutory angle as opposed to this Article's focus on patent theory. See Oskar Liivak, *Rescuing the Invention from the Cult of the Claim*, 42 SETON HALL L. REV. 1 (2012). Other authors have started down the road of defining invention and have abandoned it for a legal realist approach. See, e.g., Tun-Jen Chiang, *The Levels of Abstraction Problem in Patent Law*, 105 NW. U. L. REV. 1097 (2011). Another related discussion examines the interaction between intellectual property protection and tangible versus intangible “things.” See, e.g., Michael J. Madison, *Law as Design: Objects, Concepts, and Digital Things*, 56 CASE W. RES. L. REV. 381 (2005).

law. Patent law begins any inquiry by testing the invention for whether it is worthy of patent protection—that is, whether it is patentable.⁵ Then, if the invention is patent eligible, the inquiry shifts to determining the scope of exclusivity awarded to the invention and whether others have infringed upon those relevant rights.⁶ Given the invention's central role, determining what exactly is the invention being considered becomes crucial to any patent inquiry.

To unearth whether disputes over the concept of invention sit at the middle of recent doctrinal conflicts, this Article looks at two major doctrinal questions in dispute in recent years. The first is how patent claims, which define the patent's exclusivity, are interpreted. Patent claim methodology is always a source of contention between parties.⁷ And although the Federal Circuit went en banc in 2005 in an attempt to dispel any ambiguities, follow-on panel opinions still vary in their approaches to interpreting claims.⁸ The second doctrinal area is the written description requirement—a patentability requirement dictating what needs to be described in the patent document to qualify for patent protection.⁹ The exact contours of this validity requirement, and even whether it actually exists, have garnered much judicial and academic attention over the last twenty years, prompting the Federal Circuit to go en banc in 2009 to clarify the doctrine.¹⁰ Whether the court's 2009 decision squelched any

5. 35 U.S.C. §§ 101, 102, 103, 112 (2006) (setting forth the patentability requirements); ROBERT PATRICK MERGES & JOHN FITZGERALD DUFFY, *PATENT LAW AND POLICY* 67 (4th ed. 2007) (discussing the connection between patent eligibility and the other major patent requirements).

6. 35 U.S.C. § 271; MERGES & DUFFY, *supra* note 5, at 781-82.

7. David L. Schwartz, *Practice Makes Perfect? An Empirical Study of Claim Construction Reversal Rates in Patent Cases*, 107 MICH. L. REV. 223, 228 (2008) (“[Claim construction] is often vigorously contested by the litigants, because claim construction is often the make-or-break determination in patent litigation.”).

8. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc); see R. Polk Wagner & Lee Petherbridge, *Did Phillips Change Anything? Empirical Analysis of the Federal Circuit's Claim Construction Jurisprudence*, in *INTELLECTUAL PROPERTY AND THE COMMON LAW* (S. Balganesch ed., forthcoming 2012) (manuscript at 9), available at <http://ssrn.com/abstract=1909028> (determining empirically that there is still variation in interpretation methodology among Federal Circuit judges).

9. 35 U.S.C. § 112; *Regents of the Univ. of Cal. v. Eli Lilly & Co.*, 119 F.3d 1559, 1566 (Fed. Cir. 1997).

10. *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1342 (Fed. Cir. 2010) (en banc) (setting out the written description requirement).

disagreement over the requirement is still in question given recent written-description decisions that prompted dissents on the issue.¹¹

These are disputes in two very different doctrinal areas—one focused on interpreting claims and defining the scope of exclusivity, and the other asking whether the patent is eligible for protection to begin with. But both are also perfect examples of the basic disagreement driving most doctrinal conflicts in patent law today: a disagreement over the definition of invention in patent law.

The two competing definitions of invention are the “external invention” and the “claim-centered invention.” Under the external invention, the technical information and discussion contained in the patent’s specification define the invention.¹² The specification is the more robust part of the patent and includes descriptions and drawings of the state of the relevant technology, references to what has been done before, any specific implementations of the invention known to the inventor, and a general description of the purpose or goal of the invention.¹³ All of this information provides insight into the inventor’s actual activities and appreciations regarding the invention. That is, what the inventor considers to be her invention and how she has implemented it, or at least plans to implement it, define the external invention. The claim-centered invention, in contrast, is defined by the patent’s claims.¹⁴ A claim is a single sentence at the end of a patent that describes what the inventor wishes to have exclusivity over.¹⁵ The claim-centered invention views the

11. See, e.g., *Crown Packaging Tech., Inc. v. Ball Metal Beverage Container Corp.*, 635 F.3d 1373, 1384-86 (Fed. Cir. 2011) (Dyk, J., concurring in part and dissenting in part) (dissenting from the majority decision that the patent satisfied the written description requirement).

12. See *infra* Part I.C.1.

13. 35 U.S.C. § 112 (noting the requirements for the specification); 37 C.F.R. § 1.77(b) (2010) (describing the specification’s contents); Christopher A. Cotropia, *Patent Claim Interpretation and Information Costs*, 9 LEWIS & CLARK L. REV. 57, 68-70 (2005) (describing information-rich aspects of the specification); Lisa Larrimore Ouellette, *Do Patents Disclose Useful Information?*, 25 HARV. J.L. & TECH. (forthcoming 2012) (manuscript at 35-37), available at <http://ssrn.com/abstract=1762793>; Sean B. Seymore, *The Teaching Function of Patents*, 85 NOTRE DAME L. REV. 621, 641 (2010) (describing the technical information in patents and how to improve such information).

14. See *infra* Part I.C.2.

15. 35 U.S.C. § 112 (“The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.”).

claim itself as the invention for patent law purposes.¹⁶ The claim creates the invention and, accordingly, defines it.

Identifying these two definitions that sit at the center of the claim interpretation methodology and written description disputes has two main advantages. First, the definitions have significant explanatory power to distill doctrinal disputes to their core—the meaning of invention in patent law. Second, the definitions allow doctrinal choices to be judged against basic patent theory.

This Article makes use of both advantages. The usage of these definitions—the external and claim-centered invention definitions—is first identified in the context of recent claim interpretation methodology and written description decisions. The two definitions are then examined against patent theory to determine which definition better advances the reasons behind the patent system. This Article concludes that the external definition of invention comes closer to defining exclusivity in a manner assumed by both the incentive-to-invent and prospect theories.¹⁷ Both of these theories suppose that patent protection is at least centered on the inventor's actual inventive activities and understandings, not on a legal fiction such as the patent claim.¹⁸ Thus, the external invention, although not perfect, produces the best fit with these common patent narratives.¹⁹

Finally, explicitly choosing a definition of invention has numerous doctrinal ramifications. The correct answers to the existing debates on claim interpretation methodology and the written description requirement become clear once one uses the external invention.²⁰ Under the external invention approach claims should be interpreted in light of the specification and a robust, independent written description should be required. Using the external invention also makes second-order effects on other patent doctrines become

16. See *infra* Part I.C.2.

17. See Mark A. Lemley, *Ex Ante Versus Ex Post Justifications for Intellectual Property*, 71 U. CHI. L. REV. 129, 129-30 (2004) (describing the incentive-to-invent and prospect theories); *infra* Parts II.A.1, B.1.

18. See *infra* Part II; see also Christopher A. Cotropia, *Patent Claim Interpretation Methodologies and Their Claim Scope Paradigms*, 47 WM. & MARY L. REV. 49, 115-24 (2005) (using patent theory to select a claim interpretation methodology).

19. See *infra* Parts II.A.2, B.2.

20. See *infra* Part III.A.

evident. An external invention means that claims should be construed to preserve their validity.²¹ The external invention links the specification and its embedded disclosure requirements with claim meaning, forcing validity to be considered early.²² The resulting narrow, literal claim meaning, tied tightly by the external definition to the specification’s particular description of the invention, will leave room for a rebirth of, and reinvigorated reliance on, the doctrine of equivalents.²³ Broader protection will be needed to further patent policy in some cases, and the doctrine of equivalents will be needed once again to play this role.

The Article begins in Part I by describing the disagreements that are present in current case law in both claim interpretation methodology and the written description requirement. Then, the Article describes the underlying competing definitions of invention—external and claim-centered—and identifies those two competing definitions within these two doctrinal disputes. Part II presents the two most common justifications for the patent system: the incentive-to-invent and prospect theories. In light of these theories, the Article evaluates the two invention definitions to see which definition best fits with the theories’ assumptions regarding patent exclusivity. Part III of the Article then looks back at the doctrinal conflicts described earlier and determines how the selection of a definition of invention resolves any open issues. The Article concludes by investigating the secondary doctrinal impacts of choosing a singular definition: the external invention.

21. See *Phillips v. AWH Corp.*, 415 F.3d 1303, 1327 (Fed. Cir. 2005) (en banc).

22. See *infra* Part III.B.1.

23. See John R. Allison & Mark A. Lemley, *The (Unnoticed) Demise of the Doctrine of Equivalents*, 59 STAN. L. REV. 955, 959 (2007) (“Courts can address these imperfections with the doctrine of equivalents, which effectively expands patent claims beyond their literal scope to devices that are not very different from the patented invention.”); Lee Petherbridge, *On the Decline of the Doctrine of Equivalents*, 31 CARDOZO L. REV. 1371, 1386-88 (2010).

I. TWO MODERN CONFLICTS IN PATENT LAW DOCTRINE AND THE UNDERLYING DEFINITIONS OF INVENTION

Although disagreements exist in many areas of patent law,²⁴ two of the most pronounced disagreements in recent years involve evaluating the patent document itself. The first disagreement is the process of interpreting patent claims—single sentences found at the end of the patent. Patent claims define the area of exclusivity granted by the patent.²⁵ Accordingly, the interpretation of the claims is the crucial first step in any patent inquiry.²⁶ The second disagreement is the viability and independence of the written description requirement for patentability.²⁷ This dispute revolves around what the patent's drawings and descriptions must say about the claimed invention for the claims to be patentable.²⁸

24. *See, e.g.*, *Kappos v. Hyatt*, 131 S. Ct. 3064 (2011) (granting certiorari to determine the standard of review courts should apply to findings of the United States Patent and Trademark Office); *Caraco Pharm. Labs., Ltd. v. Novo Nordisk A/S*, 131 S. Ct. 3057 (2011) (granting certiorari on the operation of the Hatch-Waxman Act on claims of generic drugs infringing brand drugs' patents); *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 131 S. Ct. 3027 (2011) (granting certiorari on the scope of the patentable subject matter requirement as applied to personalized medicine claims).

25. 35 U.S.C. § 112 (2006); *see Aro Mfg. Co. v. Convertible Top Replacement Co.*, 365 U.S. 336, 339 (1961) (“[T]he claims made in the patent are the sole measure of the grant.”); *Phillips*, 415 F.3d at 1312 (“It is a ‘bedrock principle’ of patent law that ‘the claims of a patent define the invention to which the patentee is entitled the right to exclude.’” (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004))).

26. *McClain v. Ortmyer*, 141 U.S. 419, 424 (1891) (“The rights of the plaintiff depend upon the claim in his patent, according to its proper construction.” (quoting *Masury v. Anderson*, 16 F. Cas. 1087, 1088 (C.C.S.D.N.Y. 1873) (No. 9,270)) (internal quotation marks omitted)); *Vitronics Corp. v. Conceptoronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996) (noting that claim interpretation is the first step of the patent infringement analysis).

27. 35 U.S.C. § 112 (“The specification shall contain a written description of the invention.”); *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1340 (Fed. Cir. 2010) (en banc).

28. *Ariad*, 598 F.3d at 1340 (evaluating whether there is a “separate written description requirement”); Timothy R. Holbrook, *Possession in Patent Law*, 59 SMU L. REV. 123, 161-63 (2006) (arguing that the only role of the written description is to prevent “the addition of new matter to the patent application”); Mark D. Janis, *On Courts Herding Cats: Contending with the “Written Description” Requirement (and Other Unruly Patent Disclosure Doctrines)*, 2 WASH. U. J.L. & POL’Y 55, 62-69 (2000) (investigating whether there is an independent written description requirement and concluding that any distinction is artificial).

Although these disagreements occur in two separate doctrinal areas of patent law, the conflicts have a common root. Both are grounded in a fundamental disagreement about what the “invention” being considered is—that is, what the “invention” the claims define and the patent describes. Below, in addition to describing these doctrinal disagreements, this Part explores the underlying link between them—the definition of invention. This Part then explains the two definitions of invention, the “external” invention and “claim-centered” invention, and identifies their presence in the discourse.

A. Conflict in Claim Interpretation Methodology

Every patent is required to end with at least one claim.²⁹ Claims are single sentences in which the patentee is required, by statute, to particularly identify the invention over which she wants exclusivity.³⁰ Although it has evolved over time, the law currently views claims as defining the contours—the outer bounds—of patent protection.³¹ Under this “peripheral claiming” approach, the claims define the “fence” around the specific technology the patent holder can exclude others from practicing.³²

It comes as no surprise that defining the exact metes and bounds of the claim is a crucial step in patent law. To do so, the claim’s terms must be given meaning. The exact locations of the fence must be determined. The broader the meaning given, the greater the area of protection obtained, and vice versa.³³

29. 35 U.S.C. § 112 (“The specification shall conclude with one or more claims.”).

30. *See id.*; *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 373 (1996) (“It has long been understood that a patent must describe the exact scope of an invention and its manufacture to ‘secure to [the patentee] all to which he is entitled, [and] to apprise the public of what is still open to them.’” (alterations in original) (quoting *McClain*, 141 U.S. at 424)).

31. *Merrill v. Yeomans*, 94 U.S. 568, 570 (1876) (“This distinct and formal claim is, therefore, of primary importance, in the effort to ascertain precisely what it is that is patented.”).

32. John F. Duffy, *The Festo Decision and the Return of the Supreme Court to the Bar of Patents*, 2002 SUP. CT. REV. 273, 309-10; Karl B. Lutz, *Evolution of the Claims of U.S. Patents*, 20 J. PAT. OFF. SOC’Y 134, 134-47 (1938) (discussing the history of patent claims); William Redin Woodward, *Definiteness and Particularity in Patent Claims*, 46 MICH. L. REV. 755, 757 (1948).

33. *See, e.g.*, Cotropia, *supra* note 18, at 128 (noting that how claims are interpreted impacts the scope of patent protection).

A major area of conflict regarding claim terms is how one goes about interpreting them. Claim interpretation methodology, like many other areas of legal interpretation,³⁴ breaks down into two general approaches—one that focuses on the plain language of the claims with the other relying on additional information within the patent, such as the drawings and descriptions in the specification, to inform claim meaning.³⁵

Patents include a lot of information beyond the claims themselves. The patent specification, for example, which is the part of the patent beside the claims, includes drawings and textual descriptions of the invention—both in general terms and in specifics.³⁶ The patent specification usually describes embodiments of the invention, which are specific exemplars of how someone could actually build and use the invention.³⁷ Patents can even provide a general background on the relevant technology and descriptions of prior solutions.³⁸

The two competing claim interpretation methodologies turn on whether and how much the specification should dictate claim meaning.³⁹ Patent law speaks of not reading limitations from the

34. See E. Allan Farnsworth, “*Meaning*” in the Law of Contracts, 76 YALE L.J. 939, 959 (1967); Avery Wiener Katz, *The Economics of Form and Substance in Contract Interpretation*, 104 COLUM. L. REV. 496, 496 (2004) (“[A]lmost all applications of legal doctrine turn on questions of interpretation; and almost all questions of interpretation implicate the tension between form and substance.”); Cass R. Sunstein, *Interpreting Statutes in the Regulatory State*, 103 HARV. L. REV. 405, 424-28 (1989) (outlining competing theories of statutory interpretation). Scholars have even applied these interpretation discussions directly to the claim interpretation methodology. See, e.g., Jonathan L. Moore, *A Patent Panacea? The Promise of Corbinized Claim Construction*, 9 CHI.-KENT J. INTELL. PROP. 1, 2-4 (2010) (applying theories of contract interpretation to choose a method of claim interpretation).

35. Cotropia, *supra* note 18, at 74, 79-82 (describing questions regarding claim interpretation methodology as degrees of influence of the specification); see also R. Polk Wagner & Lee Petherbridge, *Is the Federal Circuit Succeeding? An Empirical Assessment of Judicial Performance*, 152 U. PA. L. REV. 1105, 1133-36, 1149-56, 1170-72 (2004) (detailing the current trends in claim interpretation methodology).

36. 35 U.S.C. § 112 (2006) (noting the requirements for the specification); 37 C.F.R. § 1.77(b) (2010) (describing the specification’s contents); Cotropia, *supra* note 13, at 68-70 (describing the invention-specific information-producing rules that dictate the makeup of the specification); Jeanne C. Fromer, *Patent Disclosure*, 94 IOWA L. REV. 539, 546-47, 568-70, 574 (2009).

37. See 37 C.F.R. § 1.81 (requiring the patent applicant to furnish a drawing of his invention).

38. *Id.* § 1.77(b)(6).

39. See *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (“The role

specification into the claims but also of reading the claims in light of the specification.⁴⁰ There is, not surprisingly, a very fine line between these two methodologies. When there is a particular design described in the specification but generalist claim language, a court must decide which controls and how the narrower example informs the meaning of the more general terms.⁴¹

These conflicting approaches came to a head when the Federal Circuit attempted to definitively answer this question in *Phillips v. AWH Corp.*, an en banc decision, in 2005.⁴² In that case, the question centered on the meaning of the claim term “baffles” placed inside modular walls.⁴³ The plain meaning of the term “baffles” said nothing about the baffles’ orientation within the walls’ shell.⁴⁴ However, the patent specification’s embodiments showed them displaced at various angles within the shell, never orienting themselves perpendicularly to the walls’ exterior.⁴⁵ The specification even discussed the reason for such baffles and their angular orientation—to obstruct projectiles, such as bullets in a combat or prison setting, sound, or fire.⁴⁶

The dispute in *Phillips* frames the classic question in claim interpretation methodology: Should the court interpret the term

of the specification in claim construction has been an issue in patent law decisions in this country for nearly two centuries.”); Cotropia, *supra* note 18, at 74, 79-82 (contrasting “[t]wo often cited interpretation canons [that] illustrate the friction surrounding the specification’s use in construing claims”); Wagner & Petherbridge, *supra* note 35, at 1133-34 (describing the “tension inherent in two generally accepted ... ‘canons’ of claim construction”).

40. *Compare In re Fout*, 675 F.2d 297, 300 (C.C.P.A. 1982) (“Claims must always be read in the light of the specification. Here, the specification makes plain what appellants did and did not invent.”), *with SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc.*, 242 F.3d 1337, 1340 (Fed. Cir. 2001) (“[T]he district court ... committed one of the cardinal sins of patent law—reading a limitation from the written description into the claims.”).

41. *See Comark Commc’ns, Inc. v. Harris Corp.*, 156 F.3d 1182, 1186-87 (Fed. Cir. 1998) (“[T]here is sometimes a fine line between reading a claim in light of the specification, and reading a limitation into the claim from the specification.”); 1 DONALD S. CHISUM, CHISUM ON PATENTS § 3.02[1][g][ii][B] & n.89 (2011) (“The line between interpreting claim language in light of the specification and reading a limitation from the specification into the claim is a fine one.”).

42. 415 F.3d at 1312 (indicating that the court will, once again, address the role of the specification in claim construction).

43. *Id.* at 1324-25.

44. *Id.*

45. *Id.* at 1329 (Lourie, J., concurring in part and dissenting in part).

46. *Id.* at 1329-30.

“baffles” to simply mean a baffle, regardless of angular orientation within the wall? Or, should the specification influence the meaning of “baffle” and, if so, to what extent? As the Federal Circuit put it, “The principal question that this case presents to us is the extent to which we should resort to and rely on a patent’s specification in seeking to ascertain the proper scope of its claims.”⁴⁷

The en banc majority appeared to side with a methodology that relied upon the specification in arriving at the claims’ meaning.⁴⁸ The court noted that “[t]he claims, of course, do not stand alone. Rather, they are part of ‘a fully integrated written instrument.’”⁴⁹ The specification plays an important role given the statutory linkage between it and the claim.⁵⁰ The specification is tasked with both describing and teaching how to make and use the invention, and thus this fuller description in the same patent document should influence the claim, which defines the contours of the invention.⁵¹

This push toward a specification-influenced claim interpretation methodology also led the court to reject a movement within the court emphasizing dictionary definitions of claim terms ahead of the language of the specification.⁵² The court found that such an approach of relying primarily on external definitional sources improperly “limits the role of the specification.”⁵³ Determining claim meaning by primarily using dictionaries “is inconsistent with [the Federal Circuit’s] rulings that the specification is ‘the single best guide to the meaning of a disputed term.’”⁵⁴

47. *Id.* at 1312 (majority opinion).

48. See Cotropia, *supra* note 18, at 90-91 (concluding that the court in *Phillips* adopted the “specification methodology”); Wagner & Petherbridge, *supra* note 8 (manuscript at 9) (determining that *Phillips* adopted a “Holistic” methodology).

49. *Phillips*, 415 F.3d at 1315 (quoting *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 978 (Fed. Cir. 1995)).

50. *Id.* at 1315-16.

51. *Id.* at 1315 (“[T]he descriptive part of the specification aids in ascertaining the scope and meaning of the claims inasmuch as the words of the claims must be based on the description. The specification is, thus, the primary basis for construing the claims.” (quoting *Standard Oil Co. v. Am. Cyanamid Co.*, 774 F.2d 448, 452 (Fed. Cir. 1985) (internal quotation marks omitted))).

52. *Id.* at 1319-21 (rejecting the *Texas Digital Systems, Inc. v. Telegenix, Inc.*, 308 F.3d 1193 (Fed. Cir. 2002), line of cases).

53. *Id.* at 1319-20.

54. *Id.* at 1321 (quoting *Vitronics Corp. v. Conceptronix, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)).

However, in the end, the court found that even when looking at the claims in the context of the specification, the term “baffles” should not be limited beyond its plain meaning.⁵⁵ The patent’s specification described the purposes of the claimed “baffles” to “check, impede, or obstruct flow” of objects such as projectiles or sound.⁵⁶ The drawings in the specification showed the baffles at angles to the exterior walls, with one depicting a “bullet path” deflecting from an angular baffle.⁵⁷ The court, however, determined that such descriptions did not require the baffles to be disposed at angles to achieve the advantages of having baffles.⁵⁸

The disconnect from the majority’s recitation of the proper methodology for interpreting claims—relying on the specification—and its actual interpretation of the claims—discounting the specification’s description—exemplifies the continuing doctrinal conflict and the sometimes schizophrenic approach of the Federal Circuit in this area. The articulated law in *Phillips* falls more toward a specification-oriented interpretation methodology whereas the actual analysis falls more in the claim-language-oriented camp of claim construction.⁵⁹

Judge Lourie, in his concurrence in part and dissent in part with Judge Newman, highlighted the *Phillips* majority’s schizophrenic approach.⁶⁰ Judge Lourie agreed with the majority’s “resolving [of] the relative weights of specification and dictionaries in interpreting patent claims, in favor of the specification.”⁶¹ However, Judge Lourie could not see how, when following this approach to claim interpretation, the majority adopted a broad interpretation of “baffles.”⁶² Judge Lourie noted that “the specification contains no disclosure of

55. *Id.* at 1324-27.

56. *Id.* at 1325.

57. *Id.* at 1325-26.

58. *Id.* at 1325-27 (“Accordingly, we conclude that a person of skill in the art would not interpret the disclosure and claims of the '798 patent to mean that a structure extending inward from one of the wall faces is a ‘baffle’ if it is at an acute or obtuse angle, but is not a ‘baffle’ if it is disposed at a right angle.”).

59. *See supra* notes 39-47 and accompanying text.

60. *Phillips*, 415 F.3d at 1328-30 (Lourie, J., concurring in part and dissenting in part).

61. *Id.* at 1328.

62. *Id.* at 1329.

baffles at right angles” and that angled baffles are the only baffles that meet the technology’s goal of deflecting bullets.⁶³

And the conflict goes on. Although *Phillips* attempted to settle the age-old question of how to use the specification to interpret the claim, the disagreement between the majority and the dissent shows that there is still divergence on how to properly interpret claims. Opinions after *Phillips* switch between methodologies; some rely mainly on the claim language’s plain meaning whereas others depend heavily on the specification’s text and drawings.⁶⁴ R. Polk Wagner and Lee Petherbridge’s continuing study of post-*Phillips* opinions empirically establishes this fact: Federal Circuit claim interpretation approaches still change from panel to panel after *Phillips*.⁶⁵

B. Conflict in Application of the Written Description Requirement

The written description requirement for patent protection is also the focus of recent academic discourse and an en banc decision of the Federal Circuit.⁶⁶ Although patent claim interpretation focuses on telling patent players⁶⁷ what claims mean, the validity require-

63. *Id.*

64. *See, e.g.,* Retractable Techs., Inc. v. Becton, Dickinson & Co., 653 F.3d 1296, 1303-05 (Fed. Cir. 2011) (relying heavily on the specification to interpret the claims); MBO Labs., Inc. v. Becton, Dickinson & Co., 474 F.3d 1323, 1333 (Fed. Cir. 2007) (“[P]atent coverage is not necessarily limited to inventions that look like the ones in the figures. To hold otherwise would be to import limitations onto the claim from the specification, which is fraught with ‘danger.’” (citations omitted) (citing *Phillips*, 415 F.3d at 1323; *Gart v. Logitech, Inc.*, 254 F.3d 1334, 1342 (Fed. Cir. 2001))).

65. *See* Wagner & Petherbridge, *supra* note 8 (manuscript at 27) (“The empirical analysis presented here suggests—strongly—that the *Phillips* decision has to date not had any significant measurable effect on either the jurisprudence of claim construction at the Federal Circuit, or on our (admittedly imperfect) measures of stability and predictability of the doctrine.”).

66. *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1340 (Fed. Cir. 2010) (en banc) (“Because of the importance of the issue, we granted Ariad’s petition.”); Timothy R. Holbrook, *Patents, Presumptions, and Public Notice*, 86 IND. L.J. 779, 795 (2011) (“The use of the written description in this fashion has been harshly criticized, both by judges on the court and commentators, as a standardless requirement that effectively grants the Federal Circuit discretion to strike down claims that it simply believes are too broad, regardless of what someone in the technological field might think.”).

67. *See* Clarisa Long, *Information Costs in Patent and Copyright*, 90 VA. L. REV. 465, 489-94 (2004) (dividing up these patent players into three groups: avoiders, transactors, and builders).

ments test whether the interpreted claims deserve patent protection.⁶⁸ For an invention to gain patent protection, the invention must meet certain patentability standards—namely, the invention must be novel, nonobvious, and useful.⁶⁹ The patent laws also dictate what the inventor must disclose in the patent beyond just the claims. These disclosure requirements focus on what the inventor tells the public about the invention, not whether the invention reached the required level of technical progress for protection.⁷⁰ These various disclosure requirements are found in 35 U.S.C. § 112. The two disclosure requirements of import to this Article are the enablement requirement and the written description requirement.⁷¹

The enablement requirement forces the inventor to describe to someone skilled in the relevant technology how to practice—that is, make and use—the invention without undue experimentation.⁷² This requirement has deep historic roots and its contours are fairly settled.⁷³ Enablement ensures that, when the patent does expire, the claimed technology truly passes into the public domain.⁷⁴ At the patent’s expiration, not only does exclusivity go away, but the public is also left with information on how to make and use what was being excluded.⁷⁵

In contrast to enablement, the written description requirement has proven more controversial. Although enablement is all about

68. 35 U.S.C. § 282 (2006).

69. *Id.* §§ 101-103 (setting forth these requirements for patentability).

70. *Id.* § 112 (reciting the written description, enablement, and best mode requirements).

71. See *Chiron Corp. v. Genentech, Inc.*, 363 F.3d 1247, 1253 (Fed. Cir. 2004) (noting that the specification must “enable one of ordinary skill in the art to practice ‘the full scope of the claimed invention’” (quoting *In re Wright*, 999 F.2d 1557, 1561 (Fed. Cir. 1993))); *Vas-Cath Inc. v. Mahurkar*, 935 F.2d 1555, 1562-63 (Fed. Cir. 1991) (applying the written description requirement).

72. See *PPG Indus., Inc. v. Guardian Indus. Corp.*, 75 F.3d 1558, 1564 (Fed. Cir. 1996) (holding that the patent’s specification did not violate the enablement requirement, even though some experimentation was necessary).

73. See *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1343 n.2 (Fed. Cir. 2010) (en banc) (quoting the 1836 Patent Act that codified the modern enablement requirement).

74. See *Sitrick v. Dreamworks, LLC*, 516 F.3d 993, 999 (Fed. Cir. 2008) (stating the rationale for the enablement requirement); Fromer, *supra* note 36, at 548-49 (“Disclosure ... permits society at large to apply the information by freely making or using the patented invention after the expiration of the patent.”).

75. See *Universal Oil Prods. Co. v. Globe Oil & Ref. Co.*, 322 U.S. 471, 484 (1944) (“[T]he *quid pro quo* is disclosure of a process or device in sufficient detail to enable one skilled in the art to practice the invention once the period of the monopoly has expired.”).

teaching how to implement the invention, the written description requirement is focused on whether the patent describes the invention in enough detail to establish that the inventor actually did invent the technology over which she is now claiming exclusivity.⁷⁶

Two points of contention currently surround the written description requirement. The first is whether any real difference exists between the written description inquiry and the enablement inquiry.⁷⁷ If the inventor teaches someone how to make and use the claimed technology, then has she not necessarily shown that she invented it as well?⁷⁸ Or is there a difference between teaching use and showing possession of the invention? The second question is whether the written description requirement should apply to claims in the originally filed patent application.⁷⁹ If aspects of the technology fall within the limits of the originally filed claims, then necessarily, has not the inventor described that technology and shown that she invented it at the time of filing?⁸⁰ Or does the inventor need to provide a more detailed description than a mere articulation of the boundaries of the invention in a claim to meet the written description requirement? These questions arose after the Court of Customs and Patent Appeals's 1967 decision in *In re Ruschig* regarding the written description doctrine,⁸¹ if not earlier, and they were most recently the subject of the Federal Circuit's much anticipated en banc decision in *Ariad Pharmaceuticals, Inc. v. Eli Lilly & Co.*⁸²

76. *Regents of the Univ. of Cal. v. Eli Lilly & Co.*, 119 F.3d 1559, 1566-67 (Fed. Cir. 1997) (explaining what would satisfy an adequate written description of a DNA); *Fiers v. Revel*, 984 F.2d 1164, 1170-71 (Fed. Cir. 1993) (same).

77. *Holbrook*, *supra* note 66, at 795 (noting the disagreement over whether there is an independent written description requirement).

78. *See Univ. of Rochester v. G.D. Searle & Co.*, 375 F.3d 1303, 1312-13 (Fed. Cir. 2004) (Rader, J., dissenting) (arguing that the written description requirement collapses into the enablement requirement).

79. *Id.* at 1313 (“[T]he traditional written description requirement as applied by this court and its predecessor beginning in 1967 will prohibit any addition of new matter to the patent document.”).

80. Dennis Crouch, *An Empirical Study of the Role of the Written Description Requirement in Patent Examination*, 104 NW. U. L. REV. 1665, 1670 (2010) (“Originally filed patent claims are typically self-describing.”).

81. 379 F.2d 990, 995-96 (C.C.P.A. 1967) (rejecting a patent application because the written description did not clearly convey that appellants invented the subject matter of the patent).

82. 598 F.3d 1336, 1344-47 (Fed. Cir. 2010) (en banc) (holding that the written description requirement was distinct from enablement).

Ariad involved technology regarding the regulation of gene expression by transcription factors, specifically a transcription factor named NF- κ B.⁸³ The inventors noticed that artificially interfering with NF- κ B activity could reduce the harmful side effects of certain diseases.⁸⁴ The patent at issue claimed “methods for regulating cellular responses to external stimuli by reducing NF- κ B activity in a cell.”⁸⁵

The written description issue in the case arose because the claims were directed to “the use of all substances that achieve the desired result of reducing” NF- κ B activity in cells.⁸⁶ They were so-called genus claims, encompassing a variety of methods of performing the claimed function—reducing NF- κ B activity.⁸⁷ The patent’s specification stated this desired goal of reducing NF- κ B activity and then “hypothesize[d] three types of molecules with the potential to reduce NF- κ B activity in cells: decoy, dominantly interfering, and specific inhibitor molecules.”⁸⁸ That is, the patent discussed three species within the claimed genus. This perceived disconnect between the genus claims and the specific examples in the specification prompted a written description challenge. After a jury found no written description problem and a Federal Circuit panel reversed, the whole court decided to take the case en banc to answer open questions surrounding the doctrine.⁸⁹

In its 2010 en banc decision, the Federal Circuit affirmed the existence of a written description requirement distinct from enablement.⁹⁰ According to the court, the plain language of § 112 paragraph 1 and Supreme Court precedent dictated this result.⁹¹ And although it admitted that in most cases “written description and enablement often rise and fall together,” the court concluded cases will exist in which “a written description of the invention plays a vital role in curtailing claims that do not require undue

83. *Id.* at 1340.

84. *Id.*

85. *Id.*

86. *Id.* at 1341.

87. *Id.*

88. *Id.*

89. *Id.* at 1340.

90. *Id.* at 1344-45.

91. *Id.* at 1344-47.

experimentation to make and use, and thus satisfy enablement, but that have not been invented, and thus cannot be described.”⁹²

Ariad’s patent was an example of one such case. The court noted that the patent included only “a vague functional description and an invitation for further research” and “provide[d] no example molecules” that demonstrated the claimed reduction in NF- κ B activity.⁹³ The decoy molecules mentioned in the specification were not linked to reducing NF- κ B activity, the claimed invention.⁹⁴ Instead, the patent contained a description of a desired outcome, as opposed to specific examples of how to achieve this outcome.⁹⁵

The court also concluded in *Ariad* that original claims are not necessarily self-describing.⁹⁶ “For example, a generic claim may define the boundaries of a vast genus of chemical compounds, and yet the question may still remain whether the specification, including original claim language, demonstrates that the applicant has invented species sufficient to support a claim to a genus.”⁹⁷ Original claims become particularly problematic when they use functional language to claim a desired result but do not describe the invention of something that achieves that result.⁹⁸

The court found that Ariad’s patent was an example of such a situation, with broad claims encompassing every method of reducing NF- κ B activity but with only a description of a “decoy-molecule hypothetical” in the specification.⁹⁹ The claims by themselves did not provide enough detail to show that the inventor had invented what she was claiming.¹⁰⁰

Not all of the Federal Circuit judges agreed.¹⁰¹ The dissenters in *Ariad*, including current Chief Judge Rader, believed that such an interpretation of the written description requirement “perpetuates an unnecessary tension between the claims and the written

92. *Id.* at 1352.

93. *Id.* at 1356.

94. *Id.* at 1357-58.

95. *Id.* at 1357.

96. *Id.* at 1349.

97. *Id.*

98. *Id.* at 1350.

99. *Id.* at 1358.

100. *Id.* at 1357-58.

101. *Id.* at 1339.

description as the definition of a patented invention.”¹⁰² Judge Linn noted that “[i]t is inconsistent to say that on its filing date, a patent does not show that the inventor ‘possessed’ subject matter that the claims actually encompass and the specification fully enables.”¹⁰³

The focus now, just as it was with claim interpretation methodology and *Phillips*, is on application of the en banc decision. Early applications, with continued dissents in written description decisions after *Ariad*, indicate that the disagreements over the doctrine have not gone away.¹⁰⁴

C. The Common Thread—Two Competing Definitions of Invention—“External” Versus “Claim-Centered” Invention

The two patent law areas discussed above appear to be distinct. Claim interpretation impacts the patent grant’s breadth of exclusivity, whereas the written description requirement considers a patent’s validity.

However, the basics of the discussions in both areas are quite similar. For starters, both debates concern the interaction of the patent claim with the specification. In claim interpretation, the question is how much the specification can inform, and in turn limit, the claim’s meaning. The written description discussion considers whether claim language is always enough to establish actual invention or whether the specification should be referenced to answer this inquiry. Both *Phillips* and *Ariad* wrestled with which part of the patent should dominate the patent inquiry—the claims or the specification.

This similarity between the doctrinal debates prompts a fundamental patent law question that goes beyond these particular disputes and the simple interaction between parts of the patent document: What exactly is the “invention” for purposes of patent law? Clashes over claim interpretation methodology and the written description requirement are really disputes over two competing definitions of invention. One definition that surfaces is an external

102. *Id.* at 1371 (Linn, J., dissenting in part and concurring in part).

103. *Id.*

104. *See, e.g.,* *Crown Packaging Tech., Inc. v. Ball Metal Beverage Container Corp.*, 635 F.3d 1373, 1384-86 (Fed. Cir. 2011) (Dyk, J., concurring in part and dissenting in part).

one—that is, an “invention” is defined by activities and observations outside the patent document itself and existing prior to the patent’s drafting. The second definition is an internal one, with the patent document, particularly the claims, creating the “invention,” or at least dominating its definition. These two concepts of invention—an “external invention” and a “claim-centered invention”—are further defined and then explored in detail below by again looking at the doctrinal disputes discussed above.

1. “External Invention” Defined

The “external invention” is an invention that exists independently of the patent document and prior to the filing of the patent application. The inventor defines it by engaging in some real-space activities and recognitions, which can range from the simple—notes and diagrams on a tablecloth¹⁰⁵—to the complex—the actual building and commercialization of the invention before filing the patent application.¹⁰⁶

External invention requires the inventor to conceive of the invention prior to filing. Conception, as patent law defines it, is the “formation in the mind of the inventor, of a definite and permanent idea of the complete and operative invention, as it is hereafter to be applied in practice.”¹⁰⁷ This idea, “so clearly defined in the inventor’s mind that only ordinary skill would be necessary to reduce the invention to practice, without extensive research or experimentation,”¹⁰⁸ is the external invention. It may or may not be communicated to anyone prior to patent filing, but it has a concreteness that facilitates its use in real space.

This external invention finds its way into the patent document via the specification. The specification contains many details about what the inventor thinks and has done regarding the invention. As I have noted in a previous work:

105. See Nat’l Tractor Pullers Ass’n v. Watkins, 205 U.S.P.Q. (BNA) 892, 901 (N.D. Ill. 1980) (describing the drawing of a tractor-pulling device on a tablecloth).

106. 35 U.S.C. § 102(b) (2006).

107. Hybritech Inc. v. Monoclonal Antibodies, Inc., 802 F.2d 1367, 1376 (Fed. Cir. 1986) (quoting 1 ROBINSON ON PATENTS 532 (Boston, Little, Brown & Co. 1890)).

108. Burroughs Wellcome Co. v. Barr Labs., Inc., 40 F.3d 1223, 1228 (Fed. Cir. 1994).

The specification ... usually includes additional invention-specific information. The specification frequently includes a background of the invention. This background section describes the problem the patented invention addresses and any prior attempts to solve the same or similar problems. The specification also includes a summary of the invention indicating the invention’s nature, substance, and purpose. After this background and overview, the specification provides a detailed description of the invention. In this detailed description, the patentee sets forth specific embodiments of the invention—working examples or uses of the patent invention. This detailed description is supplemented with drawings. These drawings can consist of detailed figures, flowcharts, or diagrammatic views of the invention and any described embodiments. An appendix can follow the specification, including, for example, tables of data, computer code, or “sequence listings” for genetic inventions.¹⁰⁹

The specification takes the external, real-space activities of the invention and memorializes them within the four corners of the patent document.¹¹⁰ The specification, particularly outside the claims, gives the inventor the freedom to describe the external invention in more detail and to use tables, graphs, figures, flowcharts, and pictures, in addition to words.¹¹¹

The external definition of invention does not consider the claims irrelevant. The claims still provide a means by which the inventor can indicate what parts of her external invention—described in the specification—she wishes to protect.¹¹² And the claims themselves are part of the specification, so they can also provide information

109. Cotropia, *supra* note 13, at 70 (footnotes omitted).

110. 37 C.F.R. § 1.77 (2010).

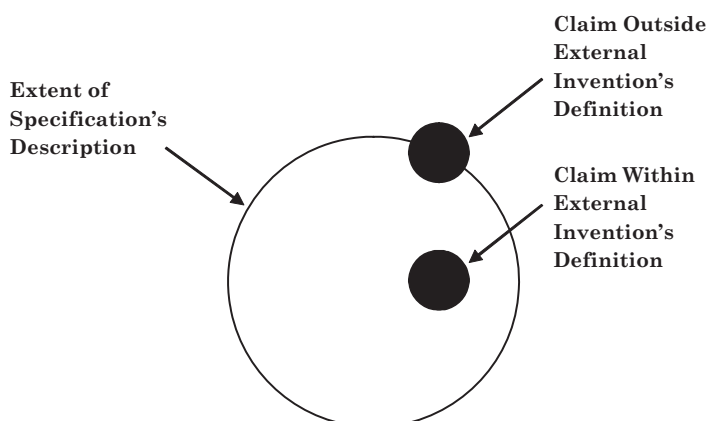
111. *See* 35 U.S.C. § 112; 37 C.F.R. § 1.77; Fromer, *supra* note 36, at 546-47. Many have noted that the specification, although including more information about what the inventor has done and considered, is “sanitized, modulated, or otherwise transformed by the legal pencil.” *See, e.g., id.* at 567-68; Michael Risch, *The Failure of Public Notice in Patent Prosecution*, 21 HARV. J.L. & TECH. 179, 224-25 (2007) (suggesting the quality of information in the patent’s specification should be improved).

112. Duffy, *supra* note 32, at 308-09 (“One benefit of early claims is that they could protect an inventor against invalidation of a patent on the ground that the patent did not ‘distinguish the [invention] from all other things before known.’” (alteration in original) (quoting Patent Act of 1793, § 3, 1 Stat. 318, 321)).

about the external invention to the extent that their restrictive form allows.¹¹³

Figure 1, below, graphically depicts the external invention and its interaction with the specification and the claims. The extent of the specification's description—the memorialization of the external invention as conceived by the inventor—are depicted as a circle and define the broadest definition of the external invention.¹¹⁴ Accordingly, claims, represented by solid dots, that capture subjects that fall entirely within the specification's description also fall within the external invention's definition. In contrast, claims that capture technology that is not fully within the specification's description fall outside the reach of the broadest definition of the external invention.¹¹⁵

Figure 1 - External Invention



113. 35 U.S.C. § 112; *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-15 (Fed. Cir. 2005) (en banc).

114. There is overlap between the large specification circle and the smaller solid claim circles because the claims are necessarily part of the specification. See 35 U.S.C. § 112. However, as discussed in *Ariad Pharmaceuticals, Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1349-50 (Fed. Cir. 2010) (en banc), the claims may attempt to capture subject matter that they do not adequately describe, such as with genus claims and a specification that describes narrow species.

115. See *Cotropia*, *supra* note 18, at 114-15 (explaining Figure 4, which demonstrates that when “the resulting claim scope is tied only loosely to the patent’s specification, the claim scope can potentially expand well beyond the specification or even exclude parts of the specification”).

a. External Invention in Claim Interpretation

In the claim interpretation methodology debate, the arguments for heavy reliance on the specification’s teachings to interpret the claims use an external definition of invention.¹¹⁶ The discourse goes deeper than merely asserting that the specification should be used. These decisions base such an approach almost explicitly on the concept of the invention at issue being an external invention. The more the specification can control claim definition, the more the methodology looks to the external invention—as memorialized in the specification—to influence the scope of exclusivity.

For example, the Federal Circuit’s decision in *Phillips* invoked the concept of an external invention when it discussed proper claim interpretation methodology.¹¹⁷ When the court discussed the claim’s meaning, it focused on the specification in determining claim meaning. As the court noted, claim terms must be read “not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification.... This court and its predecessors have long emphasized the importance of the specification in claim construction.”¹¹⁸

The court then turned to the broader concept of the invention and its role in interpretation.¹¹⁹ Here, it explicitly invoked the external invention. As the court noted, the specification is important in claim interpretation because “[u]ltimately, the interpretation to be given a term can only be determined and confirmed with a full understanding of what the inventors actually invented and intended to envelop with the claim.”¹²⁰ Put another way, courts must go beyond the claims to determine what the “inventors actually invented.”¹²¹ This full understanding of invention requires understanding the specification’s teachings¹²²—the basis for the external definition of invention.

116. See *supra* Part I.A.

117. *Phillips*, 415 F.3d at 1313-14; *Cotropia*, *supra* note 18, at 90-91; Wagner & Petherbridge, *supra* note 8 (manuscript at 9).

118. *Phillips*, 415 F.3d at 1313, 1315.

119. *Id.* at 1315-16.

120. *Id.* at 1316 (quoting *Renishaw PLC v. Marposs Società per Azioni*, 158 F.3d 1243, 1250 (Fed. Cir. 1998)).

121. *Id.*

122. *Id.*

Then, in rejecting the earlier reliance on dictionaries when interpreting claims, the court again adopted an external invention. “The main problem with elevating the dictionary to such prominence is that it focuses the inquiry on the abstract meaning of words rather than on the meaning of claim terms within the context of the patent.”¹²³ The specification, as opposed to an outside source of meaning such as a dictionary, needs to be the focus because “[t]he patent system is based on the proposition that claims cover only the invented subject matter.”¹²⁴ Interpreting the claims “in the context of the particular patent is likely to capture the scope of the actual invention more accurately.”¹²⁵

These arguments for relying on the specification to interpret claims stem from an external conception of invention. The *Phillips* court noted that the claim language should not be “divorc[ed] ... from the specification” because to do so would ignore “the actual invention.”¹²⁶ Contextualizing the claim meaning within the complete patent document, full of information about the inventive activity of the patentee and what she recognizes as her invention, brings this external definition of invention into the claim interpretation process.

The dissent in a recent Federal Circuit decision, *Arlington Industries, Inc. v. Bridgeport Fittings, Inc.*, provides another example of the external invention being used to justify this claim interpretation approach.¹²⁷ The patent in *Arlington Industries* described a connector that can snap into an electrical junction box by using one hand instead of two.¹²⁸ The patent claims recited a “spring metal adaptor” on the lead end of the connector that attaches the connector to the junction box.¹²⁹ The claim interpretation dispute concerned this claim term—spring metal adaptor—and focused on whether the term meant an adaptor with a split ring that would allow the adaptor to narrow upon insertion into the electrical junction box.¹³⁰

123. *Id.* at 1321.

124. *Id.*

125. *Id.* at 1323-24.

126. *Id.* at 1324.

127. 632 F.3d 1246 (Fed. Cir. 2011).

128. *Id.* at 1249.

129. *Id.*

130. *Id.* at 1252.

The dissent in *Arlington Industries* concluded that the claim term did mean a split ring adaptor.¹³¹ The rationale was that the patent’s specification required such a meaning.¹³² The dissent noted that the patent described the “spring metal adaptor” as having an opening “that results from not forming a complete circle.”¹³³ The figures in the specification showed the split adaptor and junction box openings that would require such a split for the adaptor to fit.¹³⁴

Viewed in the context of Figure 1 above, the dissent viewed the specification as teaching, at its broadest, an external invention that includes only split ring adaptors. For the claims to conform to this definition of invention, the claims—solid dots—must fall completely within the specification’s teachings. By defining “spring metal adaptor” to include only split ring adaptors, the claim would fall within the circle in Figure 1 and be an allowable claim interpretation. To interpret the term more broadly would place the claim partially outside the definition of external invention—outside the bigger circle—because such meaning would capture nonsplit ring adaptors.

The dissent then explicitly adopted an external definition of invention and used this definition to support its claim interpretation approach. “The bottom line of claim construction should be that the claims should not mean more than what the specification indicates, in one way or another, the inventors invented.”¹³⁵ Given this standard, “the basic mandate is for claims to be interpreted in light of the specification of which they are a part because the specification describes what the inventors invented.”¹³⁶ The dissent looked at the specification to determine the breadth of the external invention and in turn limited the claim’s meaning to this external invention—“what the inventors invented.”¹³⁷ As the dissent put it, “A patent is a teaching document. In almost all cases, the inventors, and their

131. *Id.* at 1258 (Lourie, J., concurring in part and dissenting in part).

132. *Id.* at 1257.

133. *Id.* at 1258 (noting the specification indicated that “[t]he circular metal spring adaptor 20 has an opening that results from not forming a complete circle” and that claim 1 described “said circular spring metal adaptor [as] being less than a complete circle”).

134. *Id.*

135. *Id.* at 1257-58.

136. *Id.* (citing *Vitronics Corp. v. Conceptor, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)).

137. *Id.* at 1258.

patent solicitors, kn[o]w what was invented and generally disclose[their invention.”¹³⁸

The dissent concluded that “the inventor[s] ... invention” in the case “consisted only of spring metal adaptors with an opening that results from not forming a complete circle”; that is, the metal adaptor had a split.¹³⁹ Put another way, the external invention, as described in the patent’s text and figures, included only adaptors with split ends. The dissent stayed true to this conception of invention by using the specification to interpret the claims.

b. External Invention and the Written Description Requirement

An external definition of invention supports an independent written description requirement that can apply to original claims. The debate regarding written description centers upon whether the patent document must simply teach how to make and use the claimed invention or whether it must show that the inventor was actually in possession of the invention at the time of filing. Decisions advocating for more than mere enablement in the patent go beyond simply saying that a written description requirement is mandated and explicitly invoke the concept of an external invention.

For example, use of the external invention is found throughout the Federal Circuit’s decision in *Ariad*. The court, in articulating the test for written description, noted that “the description must ‘clearly allow persons of ordinary skill in the art to recognize that [the inventor] invented what is claimed.’”¹⁴⁰ The specification must show that the inventor “had possession of the claimed subject matter as of the filing date.”¹⁴¹ Again, to determine what was “invented,” a court must look at the specification, its memorialization of the patentee’s inventive activities, and her recognition of such.

The *Ariad* decision’s application of this written description requirement also evidences a reliance on the external invention. The claims were written to capture any way of inhibiting NF- κ B

138. *Id.*

139. *Id.*

140. *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc) (quoting *Vas-Cath Inc. v. Mahurkar*, 935 F.2d 1555, 1563 (Fed. Cir. 1991)).

141. *Id.*

activity.¹⁴² However, the specification provided no examples or details of how to do this.¹⁴³ As the court noted, articulations of “a wish, or arguably a plan for future research” is not enough.¹⁴⁴ Within the four corners of the patent, there needs to be evidence that the inventor conceptualized the claimed invention by the time of filing.¹⁴⁵ The court looks for real-space evidence of the invention, such as examples or detailed theories of how the invention would work, to meet the description requirement. This is the essence of the external invention: external conceptualization of the invention.¹⁴⁶ If the claim is directed to something that is not found in the external invention, then there is no written description support.

The court’s theoretical justification for this strong written description requirement also relied upon the recognition of an external definition of invention. The court noted:

Patents are not awarded for academic theories, no matter how groundbreaking or necessary to the later patentable inventions of others. “[A] patent is not a hunting license. It is not a reward for the search, but compensation for its successful conclusion.” Requiring a written description of the invention limits patent protection to those who actually perform the difficult work of “invention”—that is, conceive of the complete and final invention with all its claimed limitations—and disclose the fruits of that effort to the public.¹⁴⁷

The Federal Circuit’s recent decision in *Centocor Ortho Biotech, Inc. v. Abbott Laboratories* is another example of the external invention driving a strong written description requirement.¹⁴⁸ The case involved use of antibodies to treat arthritis.¹⁴⁹ Overproduction of TNF- α can cause arthritis, but TNF- α antibodies can reduce the

142. *Id.* at 1355.

143. *Id.* at 1356.

144. *Id.* at 1357 (quoting *Fiers v. Revel*, 984 F.2d 1164, 1171 (Fed Cir. 1993)) (internal quotation marks omitted).

145. *Id.*

146. *See supra* Part I.C.1.

147. *Ariad*, 598 F.3d at 1353 (quoting *Univ. of Rochester v. G.D. Searle & Co.*, 358 F.3d 916, 930 (Fed. Cir. 2004)).

148. 636 F.3d 1341 (Fed. Cir. 2011).

149. *Id.* at 1344.

effect of excessive TNF- α .¹⁵⁰ Humans, however, do not naturally produce human TNF- α antibodies.¹⁵¹ There was, therefore, a push in the industry to create these antibodies artificially.¹⁵²

Centocor developed a mouse antibody to human TNF- α .¹⁵³ While the mouse antibody neutralized TNF- α activity, it also prompted an immune response in humans.¹⁵⁴ To counteract this problem, Centocor modified the constant region of the mouse antibody to look human, creating what is known as a “chimeric” antibody.¹⁵⁵ Based on this research, Centocor obtained a patent, asserted in the case, that claimed TNF- α antibodies, including such antibodies that are fully human and antibodies whose variable region, as opposed to their constant region, is human.¹⁵⁶ It then asserted these patent claims against Abbott’s fully human TNF- α antibodies.¹⁵⁷

Written description was at issue because the asserted claims recited human variable regions, whereas the patent’s specification “d[id] not disclose any fully-human ... antibody” or “a single human variable region.”¹⁵⁸ Instead, “[t]he overwhelming majority of the ... patent describes the A2 mouse antibody and the single chimeric antibody that Centocor made based on A2’s mouse variable region.”¹⁵⁹ Full human antibodies and human variable regions are mentioned in “only a few sentences” in the patent’s specification.¹⁶⁰

The Federal Circuit found no written description support for the fully human antibody claim:

[W]hile the patent broadly claims a class of antibodies that contain human variable regions, the specification does not describe a single antibody that satisfies the claim limitations. It does not disclose any relevant identifying characteristics for such fully-human antibodies or even a single human variable region. Nor does it disclose any relationship between the human

150. *Id.*

151. *Id.*

152. *Id.* at 1344-45.

153. *Id.*

154. *Id.*

155. *Id.* at 1345.

156. *Id.* at 1345-46.

157. *Id.* at 1346.

158. *Id.* at 1348.

159. *Id.* at 1349.

160. *Id.* at 1350.

TNF- α protein, the known mouse variable region that satisfies the critical claim limitations, and potential human variable regions that will satisfy the claim limitations. There is nothing in the specification that conveys to one of skill in the art that Centocor possessed fully-human antibodies or human variable regions that fall within the boundaries of the asserted claims.¹⁶¹

Placing this in the context of Figure 1 above, the specification’s teachings do not include a TNF- α antibody with a human region. The specification circle is not large enough to encompass such variations of the TNF- α antibody. Accordingly, a claim that captures such human antibodies falls outside the external invention. The claim asserted in the case is the solid dot that falls partially outside the specification’s teaching and thus is invalid because it does not meet the written description requirement.

The analysis in *Centocor*, like that in *Ariad*, looked at the external invention to see whether the claim went beyond the “invention.”¹⁶² The specification in *Centocor* showed that the external invention did not include fully human, or human variable regions, of TNF- α antibodies.¹⁶³ The inventor was not in “constructive possession” of these variants; nothing indicated that the inventor “visualize[d] or recognize[d]” such inventions prior to filing.¹⁶⁴ The broader claim was, at best, a “mere wish or plan,” not an invention, and particularly not part of the external invention.¹⁶⁵ “[I]t was entirely possible that no fully-human antibody existed that satisfied the claims” at filing.¹⁶⁶ “Centocor had not invented a fully-human ... A2 specific antibody” because this type of antibody did not fall within the inventor’s external invention, as evidenced by the specification.¹⁶⁷ Again, this line of reasoning is based on defining invention externally—as these external activities and understandings are described in the patent’s specification.

161. *Id.* at 1350-51 (citations omitted) (citing *Regents of the Univ. of Cal. v. Eli Lilly & Co.*, 119 F.3d 1559, 1566-69 (Fed. Cir. 1997)).

162. *See id.* at 1348.

163. *Id.* at 1351.

164. *Id.* at 1353 (quoting *Eli Lilly & Co.*, 119 F.3d at 1566-69).

165. *See id.* at 1349, 1351.

166. *Id.* at 1351.

167. *Id.*

2. Claim-Centered Invention

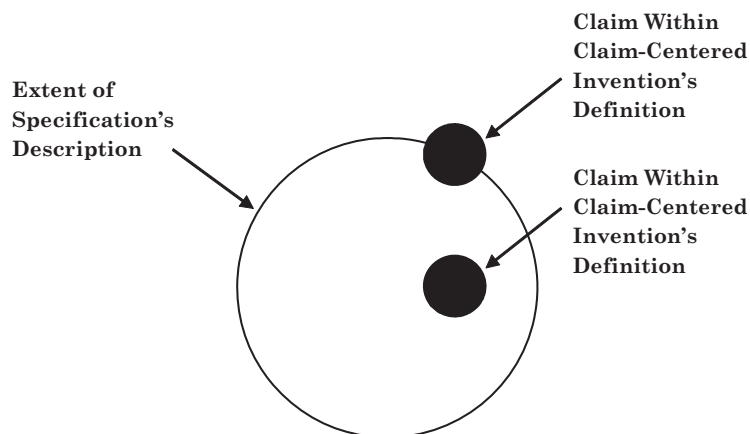
The “claim-centered” definition of the invention focuses on the patent claim, as opposed to the specification and external inventive activities, to define the invention. Under this approach, the claim *is* the invention. The invention is born from the claim, and claim language dominates the invention’s definition. The claim-centered invention takes 35 U.S.C. § 112 paragraph 2 at its literal word—that the patent shall end with “one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.”¹⁶⁸ The claim-centered invention falls in line with Judge Giles S. Rich’s famous saying “*the name of the game is the claim.*”¹⁶⁹

Under this definition of invention, the specification plays a secondary, and in some cases absent, role. Because the claim births the invention, the claim dominates discussions regarding what the invention is. The specification’s teachings cabin the claim’s scope in only very limited situations.

Figure 2, below, graphically depicts the claim-centered invention. Because the claim essentially defines the claim-centered invention by itself, the invention’s definition does not constrain the claim from falling partially outside the specification’s description. The claim, again shown as a filled dot, is self-defining and thus self-contained under this concept of invention. Where the claim goes, so goes the definition of the invention. And the specification’s description does little to dictate, and therefore little to restrain or center, the meaning of invention.

168. 35 U.S.C. § 112 (2006). Congress recently amended this language by replacing “applicant regards as his invention” with “inventor or a joint inventor regards as the invention.” Leahy-Smith America Invents Act, Pub. L. No. 112-29, § 4(c)(1)-(2), 125 Stat. 284, 296 (2011) (to be codified at 35 U.S.C. § 112).

169. See Giles S. Rich, *Extent of Protection and Interpretation of Claims—American Perspectives*, 21 INT’L REV. INDUS. PROP. & COPYRIGHT L. 497, 499 (1990) (“The U.S. is strictly an examination country and the main purpose of the examination, to which every application is subjected, is to try to make sure that what each claim defines is patentable. To coin a phrase, *the name of the game is the claim.*”).

Figure 2 - Claim-Centered Invention

a. Claim-Centered Invention in Claim Interpretation

A claim-centered concept of the invention promotes claim interpretation methodologies that focus almost exclusively on the claim language. Such methodologies stay true to a claim-centered definition by limiting the use of the specification in determining claim meaning. Put another way, those who focus on not reading limitations from the specification into the claims, as opposed to reading the claims in light of the specification, are adhering to a claim-centered definition. A claim-centered view of invention supports finding claim meaning in the claims themselves, not the specification.

Heavy reliance on dictionaries, discussed and rejected in *Phillips*, provides an example of the use of a claim-centered invention in claim interpretation.¹⁷⁰ The Federal Circuit, in *Texas Digital Systems, Inc. v. Telegenix, Inc.* and its progeny, instructed courts to rely on dictionaries, and other external references, and to refer to the specification only if the inventor explicitly defined a claim term therein.¹⁷¹ As the court in *Phillips* noted, this approach “limit[ed]

170. See *Phillips v. AWH Corp.*, 415 F.3d 1303, 1320 (Fed. Cir. 2005) (en banc).

171. 308 F.3d 1193, 1203 (Fed. Cir. 2002); see also, e.g., *SuperGuide Corp. v. DirecTV*

the role of the specification in claim construction to serving as a check on the dictionary meaning of a claim term.”¹⁷² This focused the interpretation “inquiry on the abstract meaning of words rather than on the meaning of claim terms within the context of the patent.”¹⁷³ The dictionary-reliant methodology viewed the invention being defined as very claim centered. Accordingly, the claims, not the specification, dictate the meaning. This allows claim meaning to be “divorced from the intrinsic evidence” and gives the terms meaning “in the abstract, out of [their] particular context, which is the specification.”¹⁷⁴

The majority’s methodology in *Arlington Industries, Inc. v. Bridgeport Fittings, Inc.*, although it did not follow *Texas Digital’s* reliance on dictionaries, was also based on a claim-centered invention. In interpreting “spring metal adaptor,” the court initially noted that “[c]onsistent with the ordinary and customary meaning of these words, this term imposes the limitation that the adaptor must be made of spring metal.”¹⁷⁵ The claim language did not, however, say whether a split in the adaptor was needed.¹⁷⁶ The court would import such a limitation into the claim only “if the specification manifest[ed] a clear intent to limit the term by using it in a manner consistent with only a single meaning.”¹⁷⁷ Even though all of the drawings showed a split adaptor, the court would not read such a limitation in without “clear intent to limit the claims” as such.¹⁷⁸ The majority in *Arlington Industries* stayed true to a claim-centered view of invention—allowing the claim language by itself to dominate claim meaning.

Referring back to Figure 2, the claims, as the majority interpreted them, included both the teachings of the specification—split adaptors—and variations outside the teachings—nonsplit adaptors.

Enters., Inc., 358 F.3d 870, 874-75, 882, 896 (Fed. Cir. 2004) (following *Texas Digital* and adopting a dictionary definition for “search,” which the concurrence concluded went “far beyond what the named inventors say they actually invented”).

172. *Phillips*, 415 F.3d at 1320.

173. *Id.* at 1321.

174. *Id.*

175. *Arlington Indus., Inc. v. Bridgeport Fittings, Inc.*, 632 F.3d 1246, 1253 (Fed. Cir. 2011).

176. *Id.* at 1253-54.

177. *Id.* at 1254 (citing *Irdeto Access, Inc. v. Echostar Satellite Corp.*, 383 F.3d 1295, 1303 (Fed. Cir. 2004); *SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc.*, 242 F.3d 1337, 1344 (Fed. Cir. 2001)).

178. *Id.*

The claims straddled the edge of the specification’s description. Because the court followed the claim-centered invention approach, the fact that the interpreted claims fell partially outside the specification’s description was not problematic. The claim was self-supporting and the invention being considered was centered around the claim language. Thus, the claims needed support just from the claim language, not from the specification.

This aversion to reading in limitations from the specification, witnessed in the earlier *Texas Digital* line of cases and cases such as *Arlington Industries*, is based on a belief in the claim-centered invention.¹⁷⁹ The claims define the invention and accordingly create the invention. Reading limitations from the specification to narrow the interpreted invention runs counter to this view of invention.¹⁸⁰ As the majority indicated in *Arlington Industries*, viewing the specification, not the claims, as the “‘heart of the patent’ ... devalues the importance of claim language in delimiting the scope of legal protection.”¹⁸¹ Because the claims define the invention under a claim-centered approach, the claims’ meaning must necessarily come from the claims themselves.

b. Claim-Centered Invention and the Written Description Requirement

Those decisions that reject an independent written description requirement or the requirement applying to original claims based this rejection on the claim-centered invention.¹⁸² Because, under this definition, the claims create the invention, envisioning the claims themselves as not adequately describing the invention is difficult. Certainly, the specification may not teach someone how to practice the claims and may thus fail to enable the claim. But if the invention is centered around the claims, then the claims will be enough to show possession of the invention. Given that they are considered

179. See *supra* Part I.A (explaining the conflict between claim-centered and specification-centered claim interpretation).

180. See, e.g., *Retractable Techs., Inc. v. Becton, Dickinson & Co.*, 653 F.3d 1296, 1312 (Fed. Cir. 2011) (Rader, C.J., dissenting in part) (“[A] bedrock principle of patent law [is] that the claims themselves, not the written description portion of the specification, define the patented invention.” (quoting *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc))).

181. *Arlington Indus.*, 632 F.3d at 1255 n.2.

182. See *supra* note 171 and accompanying text.

one and the same under this conception of invention, an independent written description inquiry, particularly for original claims, is unnecessary.¹⁸³ Because the claims are the invention, they always describe the invention.

The dissents in *Ariad* relied on a claim-centered invention to support their objections to an independent written description requirement.¹⁸⁴ As Judge Linn noted in his concurrence in part and dissent in part, joined by then-Judge (and current Chief Judge) Rader, “[i]t is inconsistent to say that on its filing date, a patent does not show that the inventor ‘possessed’ subject matter that the claims actually encompass and the specification fully enables.”¹⁸⁵ The dissent also pointed out that “since the 1836 Patent Act, claims have served the purpose of ‘distinguishing’ the invention, while the specification as a whole must ‘enable.’”¹⁸⁶ The dissent said that claims by their definition describe the invention.¹⁸⁷ This is the claim-centered invention. And because claims are the instruments that define the invention for patent law purposes, a separate written description requirement is unnecessary.

In *Ariad*, if the claims recited simply “inhibiting NF- κ B activity,” then they described inhibiting NF- κ B activity, regardless of the specific manner. If they failed to describe how to inhibit NF- κ B activity in any manner, they would have enablement issues but not description problems.¹⁸⁸ To conclude otherwise, the dissent noted, would “perpetuate[] an unnecessary tension between the claims and the written description as the definition of the patented invention.”¹⁸⁹ The dissent adhered to a claim-centered invention, allowing the claims to be self-describing.

Figure 2 demonstrates the *Ariad* dissent’s reliance on a claim-centered invention in its view of the written description requirement. If the invention is claim-centered, then the claims, the solid dots, are the invention for patent law purposes. They do not need

183. See *supra* text accompanying notes 102-03.

184. See *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1361-67 (Fed. Cir. 2010) (en banc) (Rader, J., dissenting in part and concurring in part); *id.* at 1367-72 (Linn, J., dissenting in part and concurring in part).

185. *Id.* at 1371 (Linn, J., dissenting in part and concurring in part).

186. *Id.*

187. See *id.* at 1368.

188. See *id.* at 1371 (“[E]nablement polices those claims effectively.”).

189. *Id.*

the description contained in the rest of the specification to meet the written description requirement. They are descriptive by themselves and thus can extend beyond the specification’s description, the larger circle, and still be valid; they can exist outside that circle and still meet the written description requirement.

The criticism of the *Centocor* decision is another example of the claim-centered definition supporting a muted written description requirement.¹⁹⁰ In *Centocor*, as in *Ariad*, the claims recited a genus—any antibody with a human constant region and a human variable region—while the specification recited a species of that genus—an antibody with one specific variable region.¹⁹¹ Critics of the decision would argue that the court should stop at the claims when determining whether an adequate description exists.¹⁹² If the claims recited any antibodies with a human constant region and a human variable region, then the inventor was in possession of such an invention. To recite such subject matter in the claims is to have taken possession of it.¹⁹³

II. USING PATENT THEORY TO CHOOSE A DEFINITION OF INVENTION

Describing the two definitions of invention at the center of various patent doctrine discussions has tremendous explanatory power. The definitions distill the fundamental disagreements to their core—what definition of invention should patent law use? Defining the invention we are trying to promote and protect in patent law would resolve doctrinal disagreements at their base.

This Part examines two diverse theories of why patent protection is needed to determine the optimum definition of invention. To that end, this Part first describes both of these theories—the “incentive-

190. See, e.g., Chris Holman, *Centocor v. Abbott: The Federal Circuit Struggles to Articulate a Coherent Standard for Compliance with the Lilly Written Description Requirement*, HOLMAN’S BIOTECH IP BLOG (Mar. 15, 2011, 2:30 PM), <http://holmansbiotechipblog.blogspot.com/2011/03/centocor-v-abbott-federal-circuit.html> (arguing that the written description requirement applied in *Centocor* “lacks any coherent doctrinal foundation”).

191. *Centocor Ortho Biotech, Inc. v. Abbott Labs.*, 636 F.3d 1341, 1348 (Fed. Cir. 2011).

192. See *Ariad*, 598 F.3d at 1371 (Linn, J., dissenting in part and concurring in part) (arguing that, at best, this presents an enablement issue, not a written description problem).

193. See Holman, *supra* note 190 (concluding that the analysis in *Centocor* “is essentially [the application of] the enablement standard”).

to-invent” theory and the “prospect” theory of patent law.¹⁹⁴ This Part then evaluates each invention definition to see which comports better with the narrative at the center of these two theories. Patent theory provides a good set of first principles to determine which one definition of invention is the “right” one, or, at the very least, better than the other in promoting the ultimate goal of the patent system. In the end, although neither definition fits both theories’ narratives perfectly, the external invention comes the closest.

A. *Incentive-to-Invent Theory*

1. *The Story*

The incentive-to-invent theory is the classic justification for the patent system.¹⁹⁵ Under this theory, patent law incentivizes the creation of inventions by giving the inventor a mechanism by which she can recoup her development costs: exclusivity.¹⁹⁶ The incentive-to-invent theory assumes the exclusive rights to the invention allow the inventor to price the invention more like a monopolist, thus above marginal cost.¹⁹⁷ The potential for this additional revenue is

194. These are commonly cited theories for patent protection. *See, e.g.*, Lemley, *supra* note 17, at 129-30, 132. Other theories of protection are not discussed in this Article. *See id.* at 130.

195. *See* U.S. CONST. art. I, § 8, cl. 8 (giving the United States Congress the power to grant patents and copyrights in order to “promote the Progress of Science and useful Arts”); Mazer v. Stein, 347 U.S. 201, 219 (1954) (“The economic philosophy behind the clause empowering Congress to grant patents and copyrights is the conviction that encouragement of individual effort by personal gain is the best way to advance public welfare.”); WILLIAM M. LANDES & RICHARD A. POSNER, *THE ECONOMIC STRUCTURE OF INTELLECTUAL PROPERTY LAW* 4-5 (2003) (reviewing rationales for intellectual property and finding the economic rationale most compelling); Dan L. Burk & Mark A. Lemley, *Policy Levers in Patent Law*, 89 VA. L. REV. 1575, 1576-77, 1580 (2003); Mark A. Lemley, *The Economics of Improvement in Intellectual Property Law*, 75 TEX. L. REV. 989, 993 (1997) (“Intellectual property is fundamentally about incentives to invent and create.”).

196. *See* *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 480 (1974) (“The patent laws promote this progress by offering a right of exclusion for a limited period as an incentive to inventors to risk the often enormous costs in terms of time, research, and development.”).

197. *See* Gideon Parchomovsky & Peter Siegelman, *Towards an Integrated Theory of Intellectual Property*, 88 VA. L. REV. 1455, 1466-67 (2002). Parchomovsky and Siegelman argue that

[A]bsent legal protection, competitors would copy such works without incurring the initial costs of producing them. Unauthorized reproduction would drive down the market price to the cost of copying, original authors and inventors would not be able to recover their expenditures on authorship and R&D, and, as a result,

what entices a would-be inventor to try to invent.¹⁹⁸ This is an *ex ante* theory in that the theory focuses on how patent law influences activities prior to the creation of the invention and the vesting of patent rights.¹⁹⁹

The full story is as follows: Inventing requires the expenditure of resources, including the inventor’s time and the costs of research and development.²⁰⁰ A would-be inventor will not attempt to invent unless she can reasonably anticipate recouping her invention-creating costs.²⁰¹ The inventor cannot rely upon physical control of the invention as a means of exclusivity because inventions are “public goods” that are easily copied and that anyone can use without depletion or depriving others of the invention’s use.²⁰² Without the ability to control the invention, the inventor cannot demand the price needed to recoup her costs and turn a profit.²⁰³

too few inventions and expressive works would be created.
Id. at 1467.

198. Lemley, *supra* note 195, at 995-96 (noting that by giving inventors “control over the use and distribution of their ideas,” intellectual property law “encourage[s] them to invest efficiently in the production of new ideas and works of authorship”); Samson Vermont, *Independent Invention as a Defense to Patent Infringement*, 105 MICH. L. REV. 475, 503-04 (2006) (“Under current law, an inventor’s incentive to invent is a function of her expected return under complete patent exclusivity weighted by the probability of obtaining that exclusivity.”).

199. Lemley, *supra* note 17, at 129-30 (referring to the incentive to invent as the “*ex ante* justification for intellectual property” law).

200. Lemley, *supra* note 195, at 994.

201. *Id.*

202. Burk & Lemley, *supra* note 195, at 1604-05 (“[I]nformation is a public good for which consumption is nonrivalrous—that is, one person’s use of the information does not deprive others of the ability to use it.”); Lemley, *supra* note 195, at 994-95; Joseph Scott Miller, *Building a Better Bounty: Litigation-Stage Rewards for Defeating Patents*, 19 BERKELEY TECH. L.J. 667, 680-81 (2004) (discussing the “free rider problem,” the public good nature of invention it creates, and how it “undercut[s] the incentive to invent”); Katherine J. Strandburg, *What Does the Public Get? Experimental Use and the Patent Bargain*, 2004 WIS. L. REV. 81, 104-05 (“The production of patentable inventions is understood to be different from other commercial activity because the investment in new ideas, unlike the investment in capital equipment or materials, is assumed to be appropriable by competitors at very little expense.”).

203. Lemley, *supra* note 195, at 994-95; *see also* Christopher A. Cotropia & James Gibson, *The Upside of Intellectual Property’s Downside*, 57 UCLA L. REV. 921, 925-27 (2010) (“Once an information good—say, a new drug or a book—is introduced into the marketplace, it becomes subject to widespread competition because the innovation is a ‘public good’ that can be easily copied and distributed without depleting its supply or depriving others of its use. The price of the information good therefore drops to the marginal cost of production.”); Parchomovsky & Siegelman, *supra* note 197, at 1466-67.

Patent law solves this conundrum by giving the inventor exclusive control over the invention.²⁰⁴ This exclusivity allows the inventor to price the invention like a monopolist.²⁰⁵ Not needing to worry about competitors who might charge less for the same invention, the inventor can charge more than merely the cost of materials and time it takes to make each commercial embodiment of the invention.²⁰⁶ This additional money allows her to recover her sunk costs and turn a profit.²⁰⁷ By facilitating such a return, patents create a carrot to prompt would-be inventors to take the plunge and try to invent.²⁰⁸ Patent law, and the exclusivity it grants, makes the endeavor worthwhile.

The incentive-to-invent theory usually assumes that the scope of exclusivity is fairly narrow, tailored to the actual invention the inventor created and is going to sell.²⁰⁹ This narrow protection is

204. See 35 U.S.C. § 271 (2006) (defining the exclusivity that patent law provides); J.E.M. AG Supply, Inc. v. Pioneer Hi-Bred Int'l, Inc., 534 U.S. 124, 131-33 (2001); *Diamond v. Chakrabarty*, 447 U.S. 303, 307 (1980) (noting that patent law promotes invention by granting inventors exclusivity over their invention); Alan Devlin & Neel Sukhatme, *Self-Realizing Inventions and the Utilitarian Foundation of Patent Law*, 51 WM. & MARY L. REV. 897, 914-16 (2009) ("Patent law therefore bestows property rights on inventors of worthy technologies, thus artificially rendering such discoveries excludable and allowing a market to develop for the technology at issue.").

205. See Cotropia & Gibson, *supra* note 203, at 927 ("This control allows rightsholders to be price searchers, as opposed to price takers who must settle for a price equivalent to marginal cost. The law thus allows rightsholders to engage in monopolistic pricing—or at least pricing that would not be possible without the market power that intellectual property confers." (footnotes omitted)). The intellectual property right does not automatically give the rightsholder market power over price. See *Walker Process Equip., Inc. v. Food Mach. & Chem. Corp.*, 382 U.S. 172, 177-78 (1965) ("There may be effective substitutes for the [patented] device which do not infringe the patent.").

206. See Einer Elhauge, *Defining Better Monopolization Standards*, 56 STAN. L. REV. 253, 296 (2003) ("[F]rom an ex post perspective, excluding rivals from any property rights valuable and unique enough to enjoy monopoly power will generally constrain consumer choice, lower output, and raise prices, thus producing allocative inefficiency.").

207. See Devlin & Sukhatme, *supra* note 204, at 915-16 ("Worse still, her inability to profit from her invention might discourage her from working toward discovering the invention in the first place. Patent law therefore bestows property rights on inventors of worthy technologies, thus artificially rendering such discoveries excludable and allowing a market to develop for the technology at issue.").

208. See Christopher A. Cotropia, "After-Arising" Technologies and Tailoring Patent Scope, 61 N.Y.U. ANN. SURV. AM. L. 151, 170 (2005) ("The incentive to invent is maintained by the would-be inventor's perception that she will get adequate protection to recoup costs.").

209. See Cotropia & Gibson, *supra* note 203, at 931-32 ("Because innovation is often cumulative, binding up old innovation in legal entitlements tends to increase development costs for follow-on innovators, who need to use the old innovation as the basis for creating new

seen as necessary to minimize the downside of exclusivity—the capture of improvements and other downstream uses of the invention by the inventor.²¹⁰ The story is that patent law wants to provide enough control to facilitate reimbursement to the inventor and entice invention but not provide so much exclusivity as to overcompensate the inventor and choke off further developments.²¹¹

2. Which Invention Definition Best Fits This Story?

The invention’s definition influences how patent law will determine the scope of exclusivity—via claim interpretation—and judge patentability—such as with the written description requirement. Patent law operates by first judging the validity of the invention and then granting exclusivity over it.²¹² The external definition focuses on the teachings of the specification as proxies for what the inventor has done and recognized outside the patent itself.²¹³ In contrast, the claim-centered definition focuses on the claim language itself.²¹⁴ The question becomes which of these definitions allows the patent to operate as the incentive-to-invent theory assumes the patent will. That is, which definition makes the patent’s exclusivity fit best with the underlying story.

The external invention falls more in line with the incentive-to-invent narrative. The various assumptions made by the theory are more likely to be true if the invention to which protection is tied is one external to the patent document as opposed to centered on the claim language.

Protection, and more particularly the scope of protection, plays a crucial role in the incentive-to-invent story. Exclusivity over the invention provides the vehicle by which the inventor brings the

information goods.... Therefore, if intellectual property law is to maximize overall innovation, it must strike a balance between too much protection and too little.”).

210. See generally Jerry R. Green & Suzanne Scotchmer, *On the Division of Profit in Sequential Innovation*, 26 RAND J. ECON. 20 (1995).

211. See Howard F. Chang, *Patent Scope, Antitrust Policy, and Cumulative Innovation*, 26 RAND J. ECON. 34, 35-36 (1995) (looking at how to balance protection between initial and follow-on innovators); Ted O'Donoghue, *A Patentability Requirement for Sequential Innovation*, 29 RAND J. ECON. 654, 673 (1998).

212. See 35 U.S.C. § 282 (2006); *Medtronic, Inc. v. Cardiac Pacemakers, Inc.*, 721 F.2d 1563, 1583 (Fed. Cir. 1983) (“[I]nvalid claim[s] cannot give rise to liability for infringement.”).

213. See *supra* Part I.C.1.a.

214. See *supra* Part I.C.2.a.

invention to market, controls its price, and then recoups her investment.²¹⁵ Tailoring exclusivity to the invention also allows protection to be narrow enough to allow follow-up inventions, which may use or improve on the invention, to flourish.²¹⁶

The external definition of the invention is the best candidate to tailor protection to the invention in the way that the incentive-to-invent theory is talking about. The external definition uses information about the actual construction or implementation of the invention to inform the breadth of exclusivity. The descriptions and drawings in the specification provide insight into how the invention will look and operate in real space and, more importantly, how the inventor believes it will look and operate.²¹⁷ Using this definition, exclusivity has a better chance of coinciding with what the inventor has actually done and is going to do because the definition is formed in the context of an actual or predicted configuration or use.²¹⁸ The definition also limits protection to these descriptions, leaving room for others technologies the inventor is unlikely to develop, considering she has not recognized them in the patent's specification.

The specification does provide a limited snapshot, both in time and depth, of how the inventor is going to proceed with the invention.²¹⁹ In fact, patent law assumes that the patent is filed early in the development process to provide protection and incentives early.²²⁰ However, the external definition still provides insights into the inventor's real-world direction for the invention. Characteristics of the invention may change before the invention goes on sale, but they will vary from a defined, contextualized starting point de-

215. See *supra* notes 204-05.

216. See *supra* Part I.C.1 (explaining the external invention).

217. See *Retractable Techs., Inc. v. Becton, Dickinson & Co.*, 653 F.3d 1296, 1298, 1305 (Fed. Cir. 2011) (“Thus, a construction of ‘body’ that limits the term to a one-piece body is required to tether the claims to what the specifications indicate the inventor actually invented.”).

218. See Cotropia, *supra* note 18, at 117-20 (“[T]he patentee does not gain control over every implementation of the invention unless the specification teaches every implementation. The patentee gets enough protection to exclude others from copying the patentee’s exact work, but not such broad protection as would likely give the patentee monopoly power.”).

219. See 37 C.F.R. § 1.77 (2010) (listing required elements of the specification, one of which is a summary of the invention).

220. See Christopher A. Cotropia, *The Folly of Early Filing in Patent Law*, 61 HASTINGS L.J. 65, 78-81 (2009) (describing patent law’s incentives to filing early).

scribed by the patent’s specification.²²¹ The incentive-to-invent story assumes patent law will use this contextualized invention and demands that patent law provide protection for an invention that is both created and eventually sold to the public.²²² The incentive-to-invent story assumes a strong link between these two iterations of the invention, and the external definition tries to stay true to that linkage.

In sharp contrast, the claim-centered invention does not reference such information when defining protection. Instead, the definition merely requires the inventor to contribute text—a single sentence—and nothing more to obtain exclusive control over a given technological area. A claim-centered definition invites disjointedness between protection and the real-world contributions of the inventor.²²³ Although the scope of protection may be commensurate with the claim-centered invention’s real-space benefits, it is just as likely that a technological area will be under the exclusive control of an inventor who has not even thought of, let alone actually begun to explore, technological development in that excluded area.²²⁴ In the context of Figure 2 above, the claim-centered definition could give control over a subject matter area—solid dot—falling well outside the specification’s teachings. This de-linking of the inventor’s development process from actual patent protection pushes the claim-centered invention out of line with the incentive-to-invent story.²²⁵

The difference in exclusivity under the two definitions impacts how the definitions fit with other aspects of the incentive-to-invent story as well. First, the incentive-to-invent theory assumes the existence of some research and development expenditures behind the patented invention.²²⁶ The amount of expenditures varies; for a

221. *See id.* at 88-93 (discussing how development continues, and more technical and market information is generated, after early filing).

222. *See supra* notes 204-05.

223. *See Cotropia, supra* note 18, at 123-24 (describing how a “heavy presumption” favoring the claim language by itself “does not tune the resulting patent scope to any other aspect of the patent, the invention, or the technology underlying the patent”).

224. *See id.* at 123 (concluding that such a claim-centered approach “can create a claim scope that fails to protect aspects of the invention altogether”).

225. *See id.* at 120-21 (finding that a specification-oriented approach links claim meaning with the inventor’s actual activities).

226. *See supra* note 199 and accompanying text.

given invention some inventors may spend more or less.²²⁷ But the existence of some costs associated with creation is what fuels the need for protection of the completed invention to recoup such costs, which in turn maintains an incentive to invent.²²⁸ The scope of exclusivity is over the very thing—the invention—for which the theory is trying to reimburse the inventor.

An external invention, by definition, invokes some inventive activities prior to filing the patent.²²⁹ The invention is defined by the inventor spending money and time on design, materials, experiments, and prototypes²³⁰—all expenses related to a real-space inventive process. When the invention's definition is based on the embodiments and actions described in the specification, development activities influence the invention's definition. These are the activities for which the incentive-to-invent theory assumes the inventor needs to be reimbursed to maintain the incentive to create.

In contrast, these research and development costs are not necessarily associated with a claim-centered invention. The claims by themselves say little about the effort expended in the creation of the defined invention. Certainly, the inventor makes some pre-filing investment in claim drafting, but this investment reflects the complexity of wordsmithing, not the design and testing of the invention itself.²³¹ The investment in patent drafting is not the type contemplated by the incentive-to-invent theory. Nor is it likely to reach a level that requires postinvention exclusivity to incentivize the claim-centered invention's creation. An external invention fits better with the preinvention investment part of the incentive-to-invent story.

The incentive-to-invent story also assumes that a product or service embodying the invention will eventually go on sale.²³² As the

227. Patents are not issued based on the amount invested into inventing. *See* *Life Techs., Inc. v. Clontech Labs., Inc.*, 224 F.3d 1320, 1325 (Fed. Cir. 2000) (“[T]he path that leads an inventor to the invention is expressly made irrelevant to patentability by statute.”); Sean B. Seymore, Essay, *Serendipity*, 88 N.C. L. REV. 185, 190 (2009) (discussing “accidental” discoveries).

228. *See supra* notes 204-05.

229. *See supra* Part I.C.1.

230. *See supra* notes 204-05.

231. *See* Christopher A. Cotropia, *Describing Patents as Real Options*, 34 J. CORP. L. 1127, 1135 (2009) (articulating the separate costs of drafting and filing a patent application).

232. *See supra* notes 204-05.

story goes, price control via patent exclusivity allows the inventor to recoup her investment.²³³ There has to be some good or service whose price can be controlled. That is, there is an assumption that the inventor will have a product or service of some type associated with the invention that will act as a vehicle to recoup costs.

The external invention is more likely than the claim-centered invention to define exclusivity around some actual good or service of the inventor and, accordingly, to link protection with these activities. An external invention is defined by real-space inventive activities, tangible things, or descriptions of those activities or things.²³⁴ The external invention defines an invention that is either being sold or close to being sold. At the very least, it is closer to coming to market than an invention defined primarily by the claims.²³⁵

On the other hand, the claim-centered invention does not need to have anything behind it in real space. A claim-centered invention disturbs the assumption that exclusivity is a viable vehicle by which costs can be recouped. Admittedly, the claim-centered inventor may recover costs via licensing, giving her a return on her investment.²³⁶ But this would require someone with no initial knowledge of the invention to still be willing to invest in creating an external invention that falls within the scope of the claim-centered one.²³⁷ This extra distance between protection and the product or service makes the claim-centered invention less of a fit with the incentive-to-invent theory.

Although it does not fall perfectly within the incentive-to-invent story, the external definition does a better job than the claim-centered invention of furthering the incentive-to-invent theory. Using the external definition of invention is more likely to give the exclusivity needed to incentivize the inventor to create while not

233. See *supra* notes 206-07 and accompanying text.

234. See *supra* Part I.C.1.

235. This is particularly true for patent applications, or more likely continuations, filed later in the development process. See Cotropia, *supra* note 220, at 101-03.

236. This is one way to monetize the patent, made popular recently by so-called “patent trolls.” See Thomas S. Kim & Michael D. Stein, *Patent Value: Increased Interest Extends Beyond “Trolls,”* LEGAL INTELLIGENCER, May 23, 2005, at IP3; see also Cotropia, *supra* note 231, at 1138 (describing this engagement in licensing as an exercise of the patent “option”).

237. Or he may simply assert the patent against others and not proceed down the commercial development path—a more likely scenario. See Cotropia, *supra* note 231, at 1138 (describing why this scenario is more likely if commercialization is not likely to occur in the near future).

overcompensating the inventor and hampering follow-on invention. The claim-centered definition's lack of grounding in both the real-space aspects and the inventor's specific implementation of the invention makes it less likely to do the same. Put simply, the external invention defines invention in a manner that the incentive-to-invent theory assumes patent law will do.

B. Prospect Theory

1. The Story

Another theory of patent law describes exclusivity as the driving force behind innovation—or commercialization—and the eventual diffusion of the patented technology.²³⁸ Patent law's main goal, under this theory, is to facilitate the commercialization of the invention, not just to encourage the underlying invention's creation.²³⁹ Exclusivity both gives the inventor “breathing room” to further develop and refine her invention and facilitates beneficial coordination with others, aiding in the invention's commercialization and improvement.²⁴⁰ This theory is commonly referred to as the “prospect theory” and was developed by Professor Edmund Kitch.²⁴¹ Patent protection is viewed as providing *ex post* incentives to prompt efficient maturity of the patented invention.²⁴²

The story is as follows: Once the invention is created, the inventor needs exclusive control over her invention—her prospect—so that she can better manage the development of the invention.²⁴³ The

238. See Michael Abramowicz & John F. Duffy, *The Inducement Standard of Patentability*, 120 YALE L.J. 1590, 1648 (2011); F. Scott Kieff, *Property Rights and Property Rules for Commercializing Inventions*, 85 MINN. L. REV. 697, 710 (2001); Ted Sichelman, *Commercializing Patents*, 62 STAN. L. REV. 341, 357 (2010) (identifying the prospect theory as a “dominant justificatory theor[y] of patent law”).

239. Kieff, *supra* note 238, at 710; see also Edmund W. Kitch, *The Nature and Function of the Patent System*, 20 J.L. & ECON. 265, 276 (1977).

240. See Kitch, *supra* note 239, at 277-78.

241. See *id.* at 285-86; see also John F. Duffy, *Rethinking the Prospect Theory of Patents*, 71 U. CHI. L. REV. 439, 444 (2004).

242. See Burk & Lemley, *supra* note 195, at 1601 (noting that the prospect theory views the goal of the patent system not as providing an incentive to invent, but as “encourag[ing] further commercialization and the efficient use of as yet unrealized ideas”); Kitch, *supra* note 239, at 285-86; Lemley, *supra* note 17, at 132-33.

243. Kitch, *supra* note 239, at 276.

patent’s exclusivity forces everyone who wants to increase the invention’s value to make arrangements with the patent owner.²⁴⁴ This both allows for efficient coordinated development and discourages wasteful duplication of efforts.²⁴⁵

The inventor is also “incentiv[ized] ... to maximize the value of the patent without fear that the fruits of the investment will produce unpatentable information appropriable by competitors.”²⁴⁶ Exclusivity allows the patent holder “to make the expenditures necessary to bring the advantages of the product to the attention of the customer without fear of competitive appropriation if the product proves successful.”²⁴⁷ The patentee can freely disclose information to others to obtain venture capital, contract for supplies, and openly advertise in the market.²⁴⁸ Basically, the patent facilitates the inventor’s development, marketing, and improvement of her invention without any unauthorized interference from others.²⁴⁹

2. Which Invention Definition Best Fits This Story?

Again, the definition of invention plays a crucial role in determining what, exactly, patent law will test for validity and provide exclusivity over. The question becomes which of these definitions allows the patent to work like the prospect theory assumes it will—that is, which definition makes the patent’s exclusivity fit best with the underlying story.

At first blush, the claim-centered invention appears to be the best fit with the prospect theory. The prospect story does not start until after the patent issues and exclusivity takes hold.²⁵⁰ This part of the patent process falls more in the realm of the claim-centered

244. *See id.* at 277-78.

245. *See* Duffy, *supra* note 241, at 444 (highlighting “the prospect features of the patent system—particularly the preference for the grant of patent rights early, before most of the resources have been committed to developing the technology and before much wasteful duplication can occur”); Kitch, *supra* note 239, at 276-77.

246. Kitch, *supra* note 239, at 276-77.

247. *Id.* at 277.

248. *Id.*

249. *See id.* at 276-77; *see also* Robert P. Merges & Richard R. Nelson, *On the Complex Economics of Patent Scope*, 90 COLUM. L. REV. 839, 871 (1990).

250. *See* Abramowicz & Duffy, *supra* note 238, at 1649 (identifying the prospect theory as an “ex post rationale,” but also describing the ex ante impact of the prospect nature of patents).

definition, in which the claim creates the invention,²⁵¹ as opposed to the external definition, which looks for prefiling activities that are then memorialized in the patent's specification.²⁵² The prospect theory also hinges most of its ex post benefits on the existence of unified control over a given technological possibility.²⁵³ The essence of the claim-centered invention is the creation of an area of exclusivity, with the patent claim both creating the invention and solely defining the metes and bounds of exclusivity. The claim-centered definition seems to be playing the role the prospect theory assumes for the patent—a vehicle that simply sets forth the “legal limits of the claim.”²⁵⁴

In fact, the prospect theory views the scope of patent protection “and the physical embodiment of the invention [as] two quite different things.”²⁵⁵ “A [patent] claim is an abstraction and generalization of an indefinitely large number of concrete, physical objects” in the theory's view.²⁵⁶ Such a statement articulates a claim-centered view of invention. And this view, in turn, can allow patent protection to “reach[] well beyond” the protection required by the incentive-to-invent theory—in other words, to amount to the broader level of protection assumed under the prospect theory.²⁵⁷ Thus, the claim-centered invention would seem to be specially made for the prospect theory. In turn, the prospect theory appears to explicitly reject an external view of invention.

However, a closer look at various aspects of the prospect theory uncovers the need to center protection around the external invention. The need for such a link initially finds its foundations in Kitch's analogy between patent claims and mineral claims, which sits at the core of the prospect theory.²⁵⁸ Mineral claims give the claim holder protection well beyond the actual minerals she has

251. *See supra* Part I.C.2.

252. *See supra* Part I.C.1.

253. *See* Peter S. Menell & Suzanne Scotchmer, *Intellectual Property*, in 2 HANDBOOK OF LAW AND ECONOMICS 1473, 1503 (A. Mitchell Polinsky & Steven Shavell eds., 2008) (arguing that Kitch viewed this unification as occurring via licensing).

254. Kitch, *supra* note 239, at 287.

255. *Id.* at 268.

256. *Id.*

257. *Id.* at 267.

258. *See id.*

found.²⁵⁹ However, mineral claim protection does not start until there is a showing of “surface mineralization.”²⁶⁰ The claimant must find some minerals, though not a commercially significant amount, before protection is granted.²⁶¹ In addition, the area of protection granted is determined “in relation to the location of the mineralization” initially found.²⁶² That is, the scope of exclusivity, although exceeding the specific area of the initial mineral finding, is still restricted by, and tied to, the initial finding.²⁶³

If patent claims are truly like mineral claims, as the prospect theory postulates, then patent protection needs to be tied to the external actions of the patentee. Considered graphically, the solid dots in Figures 1 and 2, which are the claims defining protection, need to be related in some way to the teachings of the specification—the large circles. Like mineral claims, patent prospects should not be born out of whole cloth. There is an initial activity by the inventor around which patent protection is granted. The external invention, by requiring support from the specification’s description, ties exclusivity to the inventor’s recognized inventive activities.

The external invention is also the definition of invention that is concerned with the prefling activities of the inventor.²⁶⁴ These activities are analogous to the surface mineralization that forms the foundation of the mineral claim. The claim-centered invention, in contrast, fails to link patent protection with any external activities of the inventor.²⁶⁵ In a sense, patent protection in a claim-centered invention regime does not care whether the inventor found any “minerals.” Protection is given in the abstract, without any reference to the inventor’s real-space activities.²⁶⁶ This concept of invention does not fit as well with the mineral claim analogy as does the external invention.²⁶⁷ In the external invention regime, the prospects are grounded in the inventor’s real-space activities—

259. *See id.* at 271.

260. *Id.* at 271-73.

261. *Id.*

262. *Id.* at 273.

263. *See id.*

264. *See supra* Part I.C.1.

265. *See supra* Part I.C.2.

266. *See supra* Part I.C.2 (describing the claim-centered definition).

267. *See supra* Part I.C.1 (describing the external invention).

depicted as a large circle in Figure 1 representing the specification's description.

The external invention is also a better fit than the claim-centered invention with the prospect theory's assumption that the patent holder is a superior manager and coordinator of the claimed technological prospect.²⁶⁸ The more an individual knows about the actual implementation of the invention, the better decisions that individual can make about the technology's development.²⁶⁹ In addition, such an individual will spend less time and fewer resources to get up to speed on the best way to commercialize a given invention.²⁷⁰ Either by engaging in such external inventive activity herself or by learning to do so from the inventor who did, the patent holder can more efficiently exploit the prospect.²⁷¹ An external invention ensures that the protection granted by the patent is tied to some of this real-space knowledge. The two areas co-exist. The claim-centered invention, in contrast, ensures only that the language generally describing the prospect, but nothing more, exists.²⁷²

Kitch even assumed some of this real-space knowledge about the invention would exist at the time of patenting.²⁷³ Kitch viewed the patent application as a poor mechanism for disseminating information about the invention,²⁷⁴ and argued that the patent disclosure is an inefficient and "balky mechanism" for communicating what the invention is all about.²⁷⁵ Instead, the inventor will communicate this information directly to those interested in assisting in the invention's exploitation.²⁷⁶ Although these comments indict both defini-

268. See Kitch, *supra* note 239, at 276.

269. See Lemley, *supra* note 17, at 137 ("[M]any patent owners are 'paper patentees' who never even built their invention; giving them control over distribution hardly seems a recipe for success.").

270. The inventor is much farther down the commercialization process of an invention that is defined by the specification's description. See Cotropia, *supra* note 220, at 92-93 (describing the development process and noting that the more information about a given product one has, the closer she is to commercialization).

271. *Id.* at 107-09 (explaining that the more information one has about the actual implementation of the invention, the closer one is to commercialization).

272. See *supra* Part I.C.2 (defining the claim-centered invention).

273. See Kitch, *supra* note 239, at 276-77, 287-88 (explaining that the inventor should describe the patent to show how far the legal limits of the claim extend).

274. *Id.* at 287.

275. *Id.*

276. *Id.*

tions of invention, an external invention ensures that protection is linked to at least some additional invention information—all stemming from the inventive activities of the inventor.²⁷⁷ Again, with a claim-centered invention, the claim language may be all the inventor discloses about a given technological prospect.²⁷⁸

Thus, the external invention fits better with the prospect theory of patent protection. The lack of a perfect fit may have implications as to where doctrine should go from here. That is, protection may start, or center, on the external invention, but the prospect theory, in contrast to the incentive-to-invent theory, may call upon other doctrines to expand protection—the doctrine of equivalents, for example.²⁷⁹ These “next step” implications are discussed in more detail below.

III. DOCTRINAL IMPLICATIONS OF CHOOSING THE EXTERNAL INVENTION

Even if patent theory suggests the use of a particular definition of invention, several doctrinal implications still warrant exploration. Moving from the abstract stories of the patent system to doctrinal specifics reveals how focusing on an external definition of the invention—the inventor’s description and recognition of her inventive activities—impacts patent law.²⁸⁰ How this definitional choice resolves the doctrinal conflicts discussed previously and impacts some other doctrinal areas is explored below.

A. Dictates Specific Results in Current Doctrinal Conflicts

These results should not come as a surprise. Because different definitions fueled the conflicts over claim interpretation methodology and the written description requirement, selecting a singular definition—the external invention—identifies a clear winner in these disputes. For the most part, the Federal Circuit has chosen the external invention and thus has been “correct”—at least theory-

277. See *supra* Part I.C.1 (explaining the external invention and the role of the inventive activities of the inventor).

278. See *supra* Part I.C.2 (defining the claim-centered invention).

279. See *infra* Part III.B.2.

280. See *supra* Part I.C.1 (explaining the external invention).

wise—in its doctrinal developments.²⁸¹ However, as evidenced by continued dissents in both conflict spaces,²⁸² clear recognition of a unified definition of invention would help identify a true “winner” and provide guidance as to how these doctrinal choices should develop further.

1. Claims Should Be “Read in Light of the Specification”

The big debate in claim interpretation is how the specification should inform claim meaning. Methodology driven by the claim-centered invention uses the specification sparingly, looking to it only if the patentee decided to explicitly define the terms in the specification.²⁸³ In contrast, methodology based on an external definition of the invention relies heavily on the contextual description of the inventive activities in the specification to inform the claims’ meaning.²⁸⁴ Framed another way, the claim-centered invention definition falls heavily on the “do not import limitation from the specification into the claims” side of specification usage, whereas the external definition supports a “read the claims in light of the specification” view.²⁸⁵

Consequently, choosing an external definition of the invention means the specification plays a heavy role in interpreting the

281. See, e.g., *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc) (“Since its inception, this court has consistently held that § 112, first paragraph, contains a written description requirement separate from enablement, and we have articulated a ‘fairly uniform standard,’ which we now affirm.” (quoting *Vas-Cath Inc. v. Mahurkar*, 935 F.2d 1555, 1562-63 (Fed. Cir. 1991))); *Phillips v. AWH Corp.*, 415 F.3d 1303, 1317 (Fed. Cir. 2005) (en banc) (“It is therefore entirely appropriate for a court, when conducting claim construction, to rely heavily on the written description for guidance as to the meaning of the claim.”).

282. See *Crown Packaging Tech., Inc. v. Ball Metal Beverage Container Corp.*, 635 F.3d 1373, 1384-85 (Fed. Cir. 2011) (Dyk, J., concurring in part and dissenting in part) (dissenting as to the scope of the written requirement); *Retractable Techs., Inc. v. Becton, Dickinson & Co.*, 653 F.3d 1296, 1312 (Fed. Cir. 2011) (Rader, C.J., dissenting in part) (“[A] bedrock principle of patent law’ [is] that the claims themselves, not the written description portion of the specification, define the patented invention.” (quoting *Phillips*, 415 F.3d at 1312)).

283. See *supra* Part I.C.2.a.

284. See *supra* Part I.C.1.a.

285. See *supra* note 35 and accompanying text; see also *Comark Commc’ns, Inc. v. Harris Corp.*, 156 F.3d 1182, 1186 (Fed. Cir. 1998) (“[T]here is sometimes a fine line between reading a claim in light of the specification, and reading a limitation into the claim from the specification.”).

claims. Such usage is exemplified by the discussions in *Phillips* and the dissent in *Arlington Industries* discussed above in Part I.C.1. In these opinions, the court heavily relied on the specification to determine what the invention was and then used this information to dictate claim meaning.²⁸⁶ These are examples of decisions that have chosen and applied the external definition of the invention.

Such a doctrinal decision does present questions as to what role, if any, claims play. Even when adhering to an external definition of invention, the court must use claims as the starting point of the claim interpretation analysis.²⁸⁷ The claim terms establish which aspects of the invention the patentee wishes to protect.²⁸⁸ The claim terms are a lens of sorts: they establish the angle by which exclusivity is defined. This lens—the claim terms—through which the specification is viewed, defines the scope of the protected invention. Such a role for claims brings the system back to the original purpose of peripheral claiming—focusing patent examination, and in turn the patent system, on the aspects of the patent disclosure for which the patentee is seeking protection.²⁸⁹ The claims help examiners focus on what exactly is to be tested for patentability—that is, which parts of the specification need to be tested for utility, novelty, and nonobviousness.²⁹⁰ If examiners are properly focused, this focus would simply continue in further patent venues, from district court claim interpretations to private patent valuation.

2. Disclosure Must Comply with an Independent Written Description Requirement

The debate regarding the written description requirement is another example of the two definitions facing off.²⁹¹ A claim-centered definition sees little need for an independent written description requirement given that claims can be self-describing.²⁹² According

286. See *supra* Part I.C.1.a.

287. See *supra* note 112 and accompanying text.

288. See *supra* note 112 and accompanying text.

289. See Duffy, *supra* note 32, at 309-10.

290. See Lutz, *supra* note 32, at 134-47 (discussing the history of patent claims); Woodward, *supra* note 32, at 757 (“In this country, the claims are regarded as definitions of the invention, rather than mere guides to its scope.”).

291. See *supra* Part I.C.

292. See *supra* Part I.C.2.b.

to the claim-centered definition, no other proof of possession of the invention is needed, whereas an external definition of the invention asks for a fuller description to prove that the inventor conceived of the claimed subject matter.²⁹³

Selecting an external invention thus solidifies the existence of an independent written description requirement. Decisions such as those in *Ariad* and *Centocor* provide examples of a written description doctrine implementing an external definition of invention.²⁹⁴ In both of these cases, and most of the post-*Ariad* written description cases, the Federal Circuit has implemented an external definition of invention through an independent written description requirement. Although some disputes over the doctrine persist,²⁹⁵ most courts continue to invalidate claims that the specification's disclosure reveals the inventor did not "visualize or recognize."²⁹⁶

B. Repositions Other Doctrines

Broader implications of selecting an external definition of invention exist, beyond the impact on the two doctrinal areas already discussed. These are second-order effects—byproducts of recognizing the underlying definition of invention as one that focuses beyond the claims on external indications of invention.

Two such doctrinal repositionings are discussed below. First, courts will need to be aware of the validity doctrine that governs the specification—written description, enablement, and best mode²⁹⁷—when construing the claims because they will be reading the claims in light of specification. And, second, considering that courts will likely narrowly construe claims under the external definition, the doctrine of equivalents should play a more robust role in constructing patent exclusivity to ensure patent policy stays intact.

293. See *supra* Part I.C.1.b.

294. See *supra* Part I.C.1.b.

295. See, e.g., *Crown Packaging Tech., Inc. v. Ball Metal Beverage Container Corp.*, 635 F.3d 1373, 1384-85 (Fed. Cir. 2011) (Dyk, J., concurring in part and dissenting in part) (disagreeing on scope of written description requirement).

296. *Regents of the Univ. of Cal. v. Eli Lilly & Co.*, 119 F.3d 1559, 1568 (Fed. Cir. 1997).

297. See 35 U.S.C. § 112 (2006) (explaining the validity doctrine that governs specification).

1. *Construing Claims to Meet the Disclosure Requirements*

Another open issue in claim interpretation methodology is whether claims should be construed so that they are valid.²⁹⁸ If a court is confronted with two potential claim meanings, it should choose the one that maintains the validity of the claim.²⁹⁹ Such an approach would collapse at least part of the validity inquiry into the interpretation process. This approach would also mean that the patentability requirements would influence claim meaning.

Explicit recognition of an external invention necessarily brings at least the disclosure requirements into the claim interpretation process. Because claims must be read in light of the specification, the disclosure dictates claim meaning.³⁰⁰ The claim’s ultimate meaning is required to be within the disclosure.³⁰¹ Thus, not only a written description of the invention but also an enabling disclosure and best mode are used to interpret the claims.³⁰² The explicit linkage draws the specification and the requirements that dictate its composition into claim interpretation.³⁰³

As a result, claims can have meaning—at least literal meaning—only as broad as the disclosure describes, enables, and provides the best mode for.³⁰⁴ For example, if the specification does not explain to a skilled artisan how to practice a certain aspect of the claim element without undue experimentation, then the claim element cannot be given a meaning that encompasses that aspect because it is not within the inventor’s invention for patent law

298. See *Phillips v. AWH Corp.*, 415 F.3d 1303, 1327 (Fed. Cir. 2005) (en banc) (“While we have acknowledged the maxim that claims should be construed to preserve their validity, we have not applied that principle broadly, and we have certainly not endorsed a regime in which validity analysis is a regular component of claim construction.” (citing *Nazomi Commc’ns, Inc. v. ARM Holdings, PLC*, 403 F.3d 1364, 1368-69 (Fed. Cir. 2005)); *E.I. Du Pont de Nemours & Co. v. Phillips Petroleum Co.*, 849 F.2d 1430, 1434 (Fed. Cir. 1988) (concluding that limitations should not be added to claims to preserve the validity of the claims).

299. See *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 911 (Fed. Cir. 2004) (reciting the “familiar axiom that claims should be so construed, if possible, as to sustain their validity” (quoting *Rhine v. Casio, Inc.*, 183 F.3d 1342, 1345 (Fed. Cir. 1999))).

300. See *supra* Part I.C.1.a.

301. See 35 U.S.C. § 112 (requiring that a claim particularly point out and distinguish the subject matter of the invention).

302. See *id.* (describing the three disclosure requirements).

303. See, e.g., *Phillips*, 415 F.3d at 1313 (noting that claims must be interpreted “in the context of the entire patent, including the specification”).

304. See 35 U.S.C. § 112.

purposes. The claim's meaning cannot fall outside the specification's description circle, as shown in Figure 1 above, under the external invention.³⁰⁵ These validity requirements must therefore be considered during claim interpretation and inform the ultimate claim meaning. At least, the disclosure requirements aspect of validity will play a role in claim interpretation.

2. Greater Use of the Doctrine of Equivalents

One of the results from using an external definition of the invention is that the literal claim scope is likely to be narrow.³⁰⁶ As the claims become more informed by the specification and the inventive activities described therein, the claim meaning will likely gravitate to the embodiments described. Narrow, and perhaps more, limitations will make their way into claim term meaning as the claims become tailored to the rest of the patent disclosure. This result makes sense given the approach of the external invention inquiry: defining the invention, and therefore the claim terms, to mimic the real-space understanding and activities of the inventor.

Although this produces a better fit with the patent stories than does the claim-centered definition, the resulting exclusivity may not fully carry out the patent's purpose.³⁰⁷ A greater scope of protection may be needed to ensure the inventor can control price enough to capture her costs.³⁰⁸ Or, more likely, she may need more protection to gain the breathing room needed to commercialize the invention.³⁰⁹ Narrow exclusivity tied to embodiments described in the patent can leave too much room for others to grab or dilute the value of the

305. See *supra* Figure 1.

306. See *supra* Part I.C.1.a (referring back to Figure 1 and showing how the external invention limits the scope of the claim's meaning).

307. See Glynn S. Lunney, Jr., *Patents, the Federal Circuit, and the Supreme Court: A Quiet Revolution*, 11 SUP. CT. ECON. REV. 1, 74-75 (2004).

308. *Id.* at 75 ("To the extent that patents play an important role in innovation, narrowing the doctrine of equivalents is likely to reduce the incentives for, and hence the resources invested in, innovation.").

309. See A. Samuel Oddi, *Un-Unified Economic Theories of Patents—The Not-Quite-Holy Grail*, 71 NOTRE DAME L. REV. 267, 288 (1996) ("For revolutionary inventions, the reward, patent-induced, and prospect theories would all predict a broad scope of protection, so that literal and nonliteral infringement (under the doctrine of equivalents and contributory and induced infringement) would be broadly interpreted.").

invention via minor design changes.³¹⁰ Protection over, at most, the full external invention may not be enough to incentivize people to invent or further develop the prospect.³¹¹

Patent law, however, has developed a doctrine to address these problems—the doctrine of equivalents (DOE).³¹² At its core, DOE is meant to prevent such skirting of patent protection.³¹³ DOE started as an equitable doctrine³¹⁴ but has since “shifted away from a fairness rationale for the doctrine toward an intent-neutral rationale based on economic efficiency.”³¹⁵ Courts now view DOE as making up “for the shortcomings, or, put another way, the inefficiencies, of the patent claim in properly capturing the patentee’s invention.”³¹⁶ DOE is a patent policy lever.³¹⁷

But DOE has gone into hibernation,³¹⁸ and many have postulated why. The Federal Circuit has whittled away at DOE with various defenses and exceptions to its usage—prosecution history estoppel, the all-elements rule, and public dedication, to name a few.³¹⁹ Some scholars contend that the literal claim interpretation process swal-

310. See Chiang, *supra* note 4, at 1139 (“Moreover, not only is protection beyond literal reproduction of the patentee’s creation necessary for the patent incentive to work, it can also be socially beneficial.”).

311. See *id.* at 42 (“With very few exceptions, protection against *only* literal reproduction is worthless and easily circumvented.” (footnote omitted)).

312. Warner-Jenkinson Co. v. Hilton Davis Chem. Co., 520 U.S. 17, 29 (1997); Graver Tank & Mfg. Co. v. Linde Air Prods. Co., 339 U.S. 605, 608 (1950) (“‘To temper unsparing logic and prevent an infringer from stealing the benefit of an invention’ a patentee may invoke this doctrine to proceed against the producer of a device ‘if it performs substantially the same function in substantially the same way to obtain the same result.’” (citations omitted) (quoting Sanitary Refrigerator Co. v. Winters, 280 U.S. 30, 42 (1929); Royal Typewriter Co. v. Remington Rand, Inc., 168 F.2d 691, 692 (2d Cir. 1948))).

313. See Cotropia, *supra* note 18, at 115-24.

314. Michael J. Meurer & Craig Allen Nard, *Invention, Refinement and Patent Claim Scope: A New Perspective on the Doctrine of Equivalents*, 93 GEO. L.J. 1947, 1956-57 (2005).

315. *Id.* at 1957-58; see also Cotropia, *supra* note 208, at 160.

316. Cotropia, *supra* note 208, at 161.

317. Burk & Lemley, *supra* note 195, at 1641; Cotropia, *supra* note 208, at 187 (describing how DOE can be used as a policy lever).

318. Allison & Lemley, *supra* note 23, at 966 (“By far the most dramatic finding of our study is that patentees rarely win doctrine of equivalents cases. Overall, patentees won only 24% of the doctrine of equivalents cases decided in the last eight years.”).

319. Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 535 U.S. 722, 733-37 (2002) (prosecution history estoppel); Warner-Jenkinson Co. v. Hilton Davis Chem. Co., 520 U.S. 17, 29 (1997) (all-elements rule); Johnson & Johnston Assocs. Inc. v. R.E. Serv. Co., 285 F.3d 1046, 1053-55 (Fed. Cir. 2002) (en banc) (public dedication).

lowed up the additional zone of protection DOE once provided.³²⁰ The whole scope of exclusivity discussion now occurs under the guise of the interpretation of the claims.³²¹ The fuzzier discussions of substantial similarities or insubstantial differences have been replaced by the sterile process of claim interpretation.³²²

An explicit move to the external definition of invention would likely reverse this trend. The resulting narrow, literal claim meaning will leave room to utilize DOE when patent policy dictates.³²³ Particularly if the prospect theory of patents is the policy focus, patentees and courts will have to rely on DOE to get that extra protection some may need.³²⁴ Policy, as opposed to questions of claim term meaning, would play a larger role when determining patent infringement.³²⁵

A greater role for DOE could inject more ambiguity into determining patent exclusivity.³²⁶ As opposed to focusing on claim meaning,

320. See, e.g., Allison & Lemley, *supra* note 23, at 977 (“We suspect that the real driving force behind the dramatic decline of the doctrine of equivalents is not a doctrine of equivalents case at all, but the Supreme Court’s *Markman* claim construction decision.”).

321. *Id.* (“As a result, judges increasingly sought to resolve the doctrine of equivalents as well as literal infringement on summary judgment.”); see also Dan L. Burk & Mark A. Lemley, *Fence Posts or Sign Posts? Rethinking Patent Claim Construction*, 157 U. PA. L. REV. 1743, 1763 (2009) (“Courts are aware that the text of the claims is supposed to represent the outermost boundaries of the inventor’s rights, and they are anxious not to expand the claims through the doctrine of equivalents.”).

322. Substantial similarities and insubstantial differences are two of the tests for DOE. See, e.g., *Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 339 U.S. 605, 608 (1950) (defining the test for DOE as whether the device “performs substantially the same function in substantially the same way to obtain the same result” (quoting *Sanitary Refrigerator Co. v. Winters*, 280 U.S. 30, 42 (1929))); *Hilton Davis Chem. Co. v. Warner-Jenkinson Co.*, 62 F.3d 1512, 1517 (Fed. Cir. 1995) (en banc) (applying the insubstantial difference test by looking at how different the device was from the patented claim), *rev’d on other grounds*, 520 U.S. 17 (1997). For a more in-depth look at the various tests and limitations of DOE, see Allison & Lemley, *supra* note 23, at 959-60.

323. See Burk & Lemley, *supra* note 195, at 1598 n.69 (“[T]he doctrine of equivalents provides a means for broadening the scope of a patent beyond the literal language of the claims.”).

324. See Burk & Lemley, *supra* note 321, at 1796 (“Courts should think expressly about the importance of an invention in defining its scope ... through the doctrine of equivalents.”).

325. See, e.g., *id.* at 1796-97 (envisioning renewed usage of DOE to assist in “accurately captur[ing] what the patentee invented,” particularly in the case of pioneering patents).

326. See Petherbridge, *supra* note 23, at 1374 (“But the systemic protection provided by the doctrine of equivalents comes at a cost. By allowing a patentee to exclude others from subject matter beyond the textual scope of a patent’s claims, the doctrine fosters uncertainty in competition.”).

patent players would need to determine whether a device, for example, is insubstantially different from the claimed invention.³²⁷ However, not much certainty exists in a claim-centered approach—with the ambiguity shifting from questions of insubstantial differences to the meaning of claim terms that have multiple dictionary definitions.³²⁸ Many studies on the certainty, or lack thereof, of claim interpretation support this conclusion.³²⁹

Moreover, there is also a transparency benefit to greater utilization of DOE. Major policy determinations as to the breadth of protection a patentee enjoys beyond her external invention are made in that very context, with courts explicitly asking whether the additional protection is needed for the patent system to operate properly.³³⁰ The case-by-case nature of DOE, although providing perhaps less *ex ante* certainty, at least contextualizes the inquiry by comparing what the alleged infringer has done to the inventor’s activities.³³¹ This is unlike the claim interpretation process, in which courts are instructed not to consider the infringer’s actions when interpreting claim terms.³³² The resulting exclusivity, with protection over the external invention supplemented with DOE, could be better tailored to the situation at hand and the underlying patent theory.

CONCLUSION

As demonstrated above, patent doctrine disputes can be distilled to a single question—what is the invention? By answering this question in light of first principles—basic patent theory—resolution of these disputes becomes easier. Understanding what is at the core of these conflicts and how they interrelate is very powerful, both in

327. See Allison & Lemley, *supra* note 23, at 959 (explaining the different tests for DOE).

328. See, e.g., Phillips v. AWH Corp., 415 F.3d 1303, 1319 (Fed. Cir. 2005) (en banc) (“[B]ecause words often have multiple dictionary meanings, the intrinsic record must be consulted to determine which of the different possible dictionary meanings is most consistent with the use of the term in question by the inventor.”).

329. See, e.g., Schwartz, *supra* note 7, at 249-50 (reporting on the high reversal rate of claim interpretations by district courts).

330. See Cotropia, *supra* note 208, at 152, 159-62.

331. See *id.* at 187.

332. NeoMagic Corp. v. Trident Microsystems, Inc., 287 F.3d 1062, 1074 (Fed. Cir. 2002) (“[C]laims may not be construed with reference to the accused device.”).

the clarity it provides for the particular doctrinal area and in the ability to link the conflict to broader patent policy. The hope is that, although this Article looks almost exclusively at two doctrinal areas, other judges, policymakers, and scholars will use the invention definitions, and their interactions with patent theory, to settle other areas of doctrinal ambiguity or disagreement.