

STILL ADJUSTING TO *MARKMAN*:
A PRESCRIPTION FOR THE TIMING OF
CLAIM CONSTRUCTION HEARINGS

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I. INTRODUCTION

In *Markman v. Westview Instruments, Inc.*,¹ the Supreme Court held that the interpretation of patent claims² is a question of law to be determined by the court rather than a question of fact to be decided by the jury.³ The Court based its holding on the belief that judges are better suited than juries to address claim interpretation issues and that claim interpretation by the court would result in greater uniformity in the treatment of patents. The *Markman* decision, however, has confronted the district courts with a host of thorny questions, such as what evidence they may consider in their determinations and what issues should be decided in the course of claim construction. In addition, in the process of claim construction, district court judges have had to overcome the limitations associated with their status as lay persons, lacking "skill in the art" about which they must make critical decisions. And, although the Supreme Court may have anticipated that its holding would, through *stare decisis*, lead to greater intrajurisdictional uniformity in the treatment of a given patent, it may not have anticipated another result: that *de novo* appellate review would promote frequent reversals by the Federal Circuit and thus deprive litigating parties of certainty in a given case.

One of the most intractable issues created by *Markman* is one of timing: when in the litigation process should the so-called "Markman hearing" take place? Although the district courts have considered and implemented a variety of options, no single answer has been readily forthcoming. Instead, each of the several options has its own perceived advantages and disadvantages. The court may hold the hearing at any of the following times: 1) at the outset of the litigation, 2) after fact

1. 517 U.S. 370 (1996) (hereinafter *Markman*).

2. In addition to a specification that, *inter alia*, provides a written description of the invention, a patent contains one or more "claims," which "particularly point[] out and distinctly claim[] the subject matter which the applicant regards as his invention." 35 U.S.C. § 112 (1994). A patent claim covers and secures a process, a machine, a manufacture, or a composition of matter, as well as a design for an article of manufacture. It does not, however, cover "the function or result" of an invention. Nor does it cover the scientific explanation of its operation. 1 DONALD S. CHISUM, CHISUM ON PATENTS § 1.01, at 1-1 to 1-7 (1998).

To prove infringement, a patentee must prove that an accused product or process has each limitation set forth in a specific claim. *See Markman*, 517 U.S. at 374. This showing can be made only after the meaning of the words contained in the claim has been determined. *See id.* Prior to the *Markman* decision, it was often the jury's task to determine the meaning of those words after hearing the evidence — including expert testimony — presented at trial. *See id.*

3. *See Markman*, 517 U.S. at 372.

discovery but before expert discovery, 3) after all discovery, 4) at the time summary judgment motions are considered, or 5) sometime after opening arguments, whether that be immediately after the trial begins, or just prior to the court's instruction of the jury.

This Article argues that, in most cases, there is an optimal time for holding the *Markman* hearing. Part II provides a short summary of both the Federal Circuit's holding in *Markman I*⁴ and the rationale behind the Supreme Court's affirmance of that holding. It then delves into the predictable effects of *Markman*, as well as into the maze of questions that the decision has engendered and the ways in which the district courts have answered those questions. Part III discusses the issue of the timing of claim construction hearings, presenting at the outset the possible alternatives. It argues that holding *Markman* hearings very early in the course of litigation is undesirable and inefficient, as is holding them any time after opening arguments during the infringement trial. Rather, the optimal time for the claim construction hearing is, in most cases, after discovery but before the trial begins — specifically, at the time of the court's consideration of summary judgment motions.

II. *MARKMAN* AND ITS AFTERMATH

A. *The Markman Holding*

In *Markman*, the Supreme Court considered whether patent claim interpretation is a matter of law to be addressed by judges or an issue falling under the province of the Seventh Amendment guarantee to a trial by jury. The sharply divided Court of Appeals for the Federal Circuit had held en banc that claim interpretation is the “exclusive province of the court,”⁵ and that such a conclusion was fully consistent with the Seventh Amendment right to a jury trial.⁶ The majority of the Federal Circuit noted that the description of an invention that is contained in a patent must enable “one of ordinary skill in the art to make and use it”⁷ and, further, that patent claims must state distinctly “the subject matter which the applicant regards as his invention.”⁸ Applying the principle that “the construction of a written evidence is exclusively with the

4. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967 (Fed. Cir. 1995) (hereinafter *Markman I*).

5. *Markman*, 517 U.S. at 376.

6. *See id.* The Seventh Amendment provides that, “[i]n Suits at common law, where the value in controversy shall exceed twenty dollars, the right of trial by jury shall be preserved” U.S. CONST. amend. VII.

7. *Markman I*, 52 F.3d at 978 (citing 35 U.S.C. § 112 (1994)).

8. *Id.* at 986 (citing 35 U.S.C. § 112 (1994)).

court,” the majority concluded that “a patent is uniquely suited for having its meaning and scope determined entirely by a court as a matter of law.”⁹ The majority additionally pointed out that a rule that makes claim construction the province of the court promotes certainty.

[I]t is only fair (and statutorily required) that competitors be able to ascertain to a reasonable degree the scope of the patentee’s right to exclude. They may understand what is the scope of the patent owner’s rights by obtaining the patent and prosecution history — “the undisputed public record” — and applying established rules of construction to the language of the patent claim in the context of the patent.¹⁰

According to the Federal Circuit, because it is a judge who will interpret the patent claims, competitors can “rest assured” that, in the event of infringement litigation, “the true and consistent scope of the patent owner’s rights to be given legal effect” will be discerned.¹¹

The Supreme Court affirmed this decision, unanimously holding that patent claim interpretation is a matter of law for the court and not subject to the Seventh Amendment right to a jury trial. Focusing largely on Seventh Amendment issues, the Court reviewed common law practice at the time the Constitution was drafted and concluded that the Seventh Amendment’s guarantee did not apply to patent claim interpretation.¹² Thus, the Court proceeded to “consult existing precedent and consider both the relative interpretive skills of judges and juries and the statutory policies that ought to be furthered by the allocation.”¹³ Finding no “clear answers” in relevant precedent, the Court turned finally to functional considerations, concluding that “judges, not juries, are the better suited to find the acquired meaning of patent terms,” and that construing written instruments is a basic task for which judges are trained and

9. *Id.* at 978 (internal citations omitted).

10. *Id.* at 978–79 (internal citations omitted).

11. *Id.* (internal citations omitted). Judge Mayer concurred in the result but disagreed that claim construction should be removed from the jury, referring to the majority’s holding as “bizarre” and contrary to the Seventh Amendment. *See id.* at 989, 992–93. Judge Newman dissented, arguing that claim construction is a factual, not a legal, matter and that the case should be remanded so that the district court could evaluate whether the jury’s verdict was supported by substantial evidence. *See id.* at 1000–26.

12. *See Markman*, 517 U.S. at 384.

13. *Id.*

which they frequently perform.¹⁴ In addition, the Court noted, requiring judges to construe patent claims would result in greater consistency in claim interpretation and serve “uniformity in the treatment of a given patent.”¹⁵ It stated that, “whereas issue preclusion could not be asserted against new and independent infringement defendants even within a given jurisdiction, treating interpretive issues as purely legal will promote . . . intrajurisdictional certainty through the application of stare decisis.”¹⁶

B. Markman’s Expected Effects

As Judge Newman predicted in her dissent to *Markman I*, one result of making claim construction a legal issue has been the creation of a separate hearing — the Markman hearing — which has become in many instances a “preliminary trial” during which the court receives argument or testimony regarding claim construction.¹⁷ Indeed, since *Markman*, these hearings have become the most common avenue through which courts interpret claims. And, because they may be held prior to the trial, they have become an important and decisive focus of patent litigation. However, as discussed later, little about the specifics of these hearings is settled, including the timing of the hearing and the type of evidence the court may hear.

Another expected result of *Markman* has been an increase in the number of motions for summary judgment and partial summary judgment on matters of claim construction and infringement.¹⁸ Although summary judgment on issues of claim interpretation historically was denied as requiring resolution of disputed issues of fact,¹⁹ *Markman*’s holding that claim construction is a question of law “dispelled any

14. *Id.* at 388.

15. *Id.* at 390.

16. *Id.* at 391.

17. See William F. Lee & Wayne L. Stoner, *The Role of Expert Witness on Liability Issues in Patent Litigation in Light of Markman v. Westview Instruments*, in WINNING STRATEGIES IN PATENT LITIGATION 647, 663 (PLI Patents, Copyrights, Trademarks, & Literary Property Course Handbook Series, No. 423, 1995).

18. See Robert C. Scheinfeld, *Patent and Trademark Law: “Markman” Issues Ready for Supreme Court Review*, N.Y.L.J., Dec. 15, 1995, at 9 (“As evidenced by this case and others pending in this court, in view of *Markman*, parties will now routinely move for the early resolution of the claim construction issue either under Federal Rule of Civil Procedure 56 or 12(b)(6).”).

19. See Frank M. Gasparo, Note, *Markman v. Westview Instruments, Inc. and its Procedural Shock Wave: The Markman Hearing*, 5 J.L. & POL’Y 723, 762–63 (1997); see also *Continuous Curve Contact Lenses, Inc. v. Rynco Scientific Corp.*, 680 F.2d 605, 606 (9th Cir. 1982) (stating that the Ninth Circuit has been “unsympathetic to summary judgments in patent cases”).

lingering doubts about whether patent claims are to be characterized as posing factual issues."²⁰ In many cases, there is no factual question as to the nature and operation of the accused device, and, therefore, the infringement issue can be disposed of at the summary judgment stage.²¹ The only remaining question will be claim construction, and the court's resolution of this question of law will be the decisive issue in the case.²² Indeed, in the wake of *Markman*, an ever-increasing number of Federal Circuit decisions have resolved the question of infringement as a matter of law.²³ This noticeable growth in the number of decisions on infringement as a matter of law is the combined result of *Markman* and the clear directive of *Warner-Jenkinson Co., Inc. v. Hilton Davis Chemical Co.*²⁴ that the district courts should decide infringement as a matter of law in appropriate circumstances.²⁵

Although the emergence of claim construction hearings and an increased number of summary judgment motions were relatively predictable effects, *Markman* has also left in its wake many unsettled questions regarding the procedure to be followed in interpreting claims, as well as the role of the court in the claim construction process. As various articles and commentaries have already pointed out, the timing and procedures that judges are to follow in interpreting claims are far from settled, and courts' practices in interpreting claim language have

20. Gasparo, *supra* note 19, at 763; *Elf Atochem N. Am., Inc. v. Libbey-Owens-Ford Co.*, 894 F. Supp. 844, 857 (D. Del. 1995) (noting that one result of *Markman* will be an increase in summary judgment motions).

21. See Gasparo, *supra* note 19, at 764-65 (quoting Michael A. Lechter, *Simplifying Patent Infringement Litigation*, WASH. TECH., Apr. 27, 1995, at 23).

22. See *id.*; see also *Mason v. Tampa G Mfg. Co.*, 68 F.3d 488 (Table), No. 95-1184, 1995 U.S. App. LEXIS 28368 (Fed. Cir. Oct. 12, 1995) (Text) (affirming summary judgment of non-infringement based on the conclusion that no factual issues existed relating to the structure and operation of the accused device); *Lovelett v. Peavey Elecs. Corp.*, 41 U.S.P.Q.2d (BNA) 1192 (S.D.N.Y. 1996) (construing disputed patent claims and granting defendant's summary judgment motion).

23. See, e.g., *Sextant Avionique, S.A. v. Analog Devices, Inc.*, 172 F.3d 817 (Fed. Cir. 1999); *Bai v. L & L Wings, Inc.*, 160 F.3d 1350 (Fed. Cir. 1998); *EMI Group N. Am., Inc. v. Intel Corp.*, 157 F.3d 887 (Fed. Cir. 1998); *Phillips Petroleum Co. v. Huntsman Polymers Corp.*, 157 F.3d 866 (Fed. Cir. 1998); *Desper Prods., Inc. v. Qsound Labs, Inc.*, 157 F.3d 1325 (Fed. Cir. 1998); *Tronzo v. Biomet, Inc.*, 156 F.3d 1154 (Fed. Cir. 1998).

24. 520 U.S. 17 (1997).

25. See *id.* at 39 n.8. However, when the nature of the accused device is neither "clearly understood by the court [n]or stipulated to by the parties," there will be a factual dispute, and the court's claim interpretation will not dispose of the infringement question. See Gasparo, *supra* note 19, at 765. In such a situation, the case continues to trial, but the only inquiry is whether the accused device infringes the claims in issue as interpreted by the court. See, e.g., Kulpreet S. Rana, *Purifying a Mongrel Practice*, IP MAG., May 1998, at 12, 14.

varied wildly.²⁶ This divergence in approach derives in large part from the well established principle that claim interpretation must be conducted from the perspective of “one skilled in the art” of the subject matter of the patent claim. Yet, only rarely does a judge fall into that category. Rather, unlike the situation in which a judge is interpreting a statute or a contract, in the process of claim construction he or she is essentially a layperson. As a result, courts must confront the issues of precisely what should be decided at a Markman hearing and what evidence — intrinsic, extrinsic, or otherwise²⁷ — should be considered in the claim interpretation process. But among the most vexing questions raised by *Markman* is whether claim interpretation should take place early in the case, at some point after discovery, or at the jury instruction phase of the trial. Neither the Supreme Court nor the Federal Circuit has settled this question, leaving district courts to struggle with it.

As the following discussion demonstrates, determining the best point in the litigation process for claim construction cannot be done independent of consideration of numerous other issues raised by *Markman*. In particular, as Section C points out, *Markman* and its progeny have generated substantial confusion as to the proper use of evidence other than the patent and its file history. In addition, there is the question, discussed in Section D, of the impact of the appellate process on the goals of certainty and predictability articulated in *Markman*. Finally, Section E observes that the mixed implications of *Markman* for the finality of claim interpretation have substantially affected the willingness of parties to settle. These questions concerning appropriate evidence, appellate review, and settlement combine to make the issue of timing all the more tricky because they present numerous factors that courts must balance against each other — in addition to the over-arching concern about efficiency in a world of limited judicial resources. Ultimately, then, the answers to the many questions presented by *Markman* are bound to one another.

26. See W. Edward Bailey, *Unresolved Issues in a Post-Markman World*, in PATENT LITIGATION 1997, at 339, 343–49 (PLI Patents, Copyrights, Trademarks, & Literary Property Course Handbook Series No. 492, 1997); David H. Binney & Toussaint L. Myricks, *Patent Claim Interpretation After Markman — How Have the Trial Courts Adapted?*, 38 IDEA 155, 164–82 (1997); Constance S. Huttner et al., *Markman Practice, Procedures and Tactics*, in PATENT LITIGATION 1998, at 535, 538–48, 551–57 (PLI Patents, Copyrights, Trademarks, & Literary Property Course Handbook Series No. G-531, 1998).

27. For definitions of intrinsic and extrinsic evidence, see *infra* text accompanying notes 28–30.

C. Extrinsic Evidence and Expert Testimony

Markman established two categories of evidence for patent claim construction. The first is intrinsic evidence, which consists of the patent claims, the specification, and the prosecution history.²⁸ Intrinsic evidence is the most important tool for interpreting claims because it represents a public record on which competitors should be able to rely to determine the scope of a patentee's invention.²⁹ The second category of evidence is extrinsic evidence, which is all other evidence, including articles, technical treatises, prior art, dictionaries, inventor testimony, and expert testimony.³⁰

Although *Markman* instructs that courts must rely primarily on intrinsic evidence in construing patent claims, the extent to which they may draw from extrinsic evidence has been further elaborated by subsequent Federal Circuit decisions. In *Vitronics Corp. v. Conceptronic, Inc.*,³¹ the court determined that, in those situations in which the clear meaning of a patent claim is set forth in the patent, its prosecution history, and its specification, no extrinsic evidence should be employed in interpreting the claim.³² In particular, the court opined that the claim analysis should begin with the words contained in the claims themselves and that those claim words should be construed in light of the intrinsic evidence.³³ Thus, judges should not base their claim interpretations on expert testimony or on any other evidence not intrinsic to the patent documents themselves, unless such intrinsic evidence is insufficient to resolve any ambiguity in the meaning of the claim terms.³⁴

In *Fromson v. Anitec Printing Plates, Inc.*,³⁵ however, the Federal Circuit signaled a more liberal attitude toward extrinsic evidence than that shown in *Vitronics*. In *Fromson*, the accused process met the standard dictionary definition of a claim term, and there was no contrary definition in the specification or file history.³⁶ Nonetheless, the district court entered a judgment of non-infringement based on its finding that

28. See *Markman I*, 52 F.3d at 979–80; see also Huttner et al., *supra* note 26, at 537.

29. See *Markman I*, 52 F.3d at 978–79.

30. See *id.* at 980–81.

31. 90 F.3d 1576 (Fed. Cir. 1996).

32. See *id.* at 1582–83. The court engaged in a similar discussion in *Bell & Howell Document Management Products Co. v. Altek Systems*, 132 F.3d 701, 705 (Fed. Cir. 1997).

33. See *Vitronics*, 90 F.3d at 1582. The court thus recognized the established patent law principle that a patentee may be his or her own lexicographer and, as such, may use words in ways inconsistent with or contrary to their ordinary meaning. See *id.*

34. See *id.* at 1583; *Bell & Howell*, 132 F.3d at 706.

35. 132 F.3d 1437, 1444 (Fed. Cir. 1997).

36. See *id.* at 1442–45.

the term, as used in the claims, required a feature that the accused product did not have.³⁷ In so holding, the district court was required to resolve conflicting extrinsic evidence about the technology.³⁸ The Federal Circuit affirmed, expressly endorsing the district court's use of extrinsic evidence. It acknowledged *Markman*'s comments concerning extrinsic evidence but rejected a formulaic approach, noting that the "general rule" is "adaptable to the needs of the particular case."³⁹ In particular, the Federal Circuit endorsed the district court's use of extrinsic evidence for the purpose of understanding the "finer points of the technology" because it was that understanding that allowed the court to understand the specification and what was required of the feature at issue in the claim.⁴⁰

Just three months later, however, the Federal Circuit questioned *Fromson* in an en banc opinion in *Cybor Corp. v. FAS Technologies, Inc.*⁴¹ There, the court reaffirmed that claim construction is entirely a matter of law for the court and is subject to de novo review on appeal. In so holding, the Federal Circuit expressly rejected the notion that "claim construction may involve subsidiary or underlying questions of fact."⁴² While *Cybor* does not directly address the issue of extrinsic evidence, the court acknowledged that it was "difficult to reconcile the language and reasoning" in *Fromson* with the Federal Circuit's analysis in *Markman*.⁴³

Cybor itself, however, provides the necessary tools to accomplish that reconciliation. The *Cybor* court noted that, although a district court should not make factual findings or credibility determinations on the basis of extrinsic evidence, it may use extrinsic evidence as an aid "in coming to a correct conclusion as to the true meaning of the language employed in the patent."⁴⁴ Thus, *Cybor* recognizes that, to construe

37. See *id.* at 1444–45.

38. See *id.* at 1444.

39. *Id.*

40. *Id.* at 1443–45; see also *Key Pharm. v. Hercon Lab. Corp.*, 161 F.3d 709, 716 (Fed. Cir. 1998) ("This court has made strong cautionary statements on the proper use of extrinsic evidence . . . which might be misread by some members of the bar as restricting a trial court's ability to *hear* such evidence. We intend no such thing. To the contrary, trial courts generally can hear expert testimony for background and education on the technology implicated by the presented claim construction issues, and trial courts have broad discretion in this regard.") (emphasis in original).

41. 138 F.3d 1448 (Fed. Cir. 1998) (en banc).

42. *Id.* at 1455.

43. *Id.* at 1454 n.3.

44. *Id.* The split within the Federal Circuit on the use of extrinsic evidence in claim interpretation remained evident in the "additional views" of Judges Newman and Mayer, who noted that "[t]he Federal Circuit's ruling that extrinsic evidence must be restricted unless there is a facial ambiguity in the meaning of the claim is an unnecessary restraint

claims, it may well be necessary for district courts to rely on expert testimony but that, as they do so, they are only seeking background information and other guides to interpretation and are not making factual findings.⁴⁵

This is precisely the result that the Federal Circuit reached in *Pitney Bowes, Inc. v. Hewlett-Packard Co.*⁴⁶ Once again addressing the use of extrinsic evidence, the Federal Circuit noted that “*Vitronics* does not prohibit courts from examining extrinsic evidence, even when the patent document is itself clear.”⁴⁷ The Court further noted that “*Vitronics* does not set forth any rules regarding the admissibility of expert testimony as to evidence,” and that “there are no prohibitions in *Vitronics* on courts hearing evidence from experts.”⁴⁸ Describing the appropriate use of extrinsic evidence, the Federal Circuit stated:

[U]nder *Vitronics*, it is entirely appropriate, perhaps even preferable, for a court to consult trustworthy extrinsic evidence to ensure that the claim construction it is tending to from the patent file is not inconsistent with clearly expressed, plainly apposite, and widely held understandings in the pertinent technical field. This is especially the case with respect to technical terms Indeed, a patent is both a technical and a legal document. While a judge is well-equipped to interpret the legal aspects of the document, he or she must also interpret the technical aspects of the document, and indeed its overall meaning,

on potentially useful evidence.” *Id.* at 1480.

45. A court could hold a hearing in which it receives both intrinsic and extrinsic evidence by first hearing intrinsic evidence and then, if necessary, hearing extrinsic evidence, as suggested in *Vitronics Corp. v. Conceptoronic, Inc.*, 90 F.3d 1576, 1583–84 (Fed. Cir. 1996). By contrast, a court could receive both intrinsic and extrinsic evidence and then determine the evidence on which it will base its claim construction order. See Michael O. Sutton et al., *Don't Miss the Mark, Man!: Recent Trends and Evidentiary Considerations in Markman Hearings*, in 18TH ANNUAL INSTITUTE ON COMPUTER LAW 867, 892 (PLI Patents, Copyrights, Trademarks, & Literary Property Course Handbook Series No. 507, 1998); *Elf Atochem N. Am., Inc. v. Libbey-Owens-Ford Co.*, 894 F. Supp. 844 (D. Del. 1995) (issuing a claim construction order after a two-day hearing during which each party presented technical experts); *Loral Fairchild Corp. v. Victor Co. of Japan*, 906 F. Supp. 798 (E.D.N.Y. 1995) (same).

46. 182 F.3d 1298 (Fed. Cir. 1999).

47. *Id.* at 1308.

48. *Id.*

from the vantage point of one skilled in the art. Although the patent file may often be sufficient to permit the judge to interpret the technical aspects of the patent properly, consultation of extrinsic evidence is particularly appropriate to ensure that his or her understanding of the technical aspects of the patent is not entirely at variance with the understanding of one skilled in the art.⁴⁹

In their concurrence, Judges Rader and Plager expressly acknowledged the benefits of extrinsic expert testimony: (1) providing “a proper technological context to understand the claims”; (2) explaining “the meaning of claim terms as understood by one of skill in the art”; and (3) assisting the trial court in understanding “the patent process itself.”⁵⁰ The concurring judges specifically described *Pitney Bowes* as restating the role of expert testimony and applauded the Federal Circuit’s “effort to express more trust in the ‘broad latitude’ and ‘considerable leeway’ afforded presiding trial judges in assessing the reliability of expert testimony.”⁵¹

Pitney Bowes articulates the most sensible and appropriate use of extrinsic evidence. The literal directive of *Vitronics* had led many district courts to unnecessarily confine themselves to consideration of *only* the intrinsic evidence. But trial judges typically do not qualify as being “skilled in the art” of the technology at issue. That is, they normally are not well-versed in the technical language and processes described in the patent claims that they must interpret. Indeed, numerous observers have raised doubts as to whether judges are able to render competent claim interpretations without using extrinsic evidence, and, in particular, hearing expert testimony, which is perhaps the most important type of extrinsic evidence that judges rely on in understanding the technical language of patent documents. Even the most experienced intellectual property practitioners cannot simply read a patent and file history and divine the correct meaning of claim terms; they too require and seek information about the relevant technology. Thus, as one commentator has noted, “[f]or the average intellectual property litigant, the notion that trial judges are uniquely qualified to divine and declare as a matter of law the true meaning of a patent claim, or the scope of a

49. *Id.* at 1309 (internal citations omitted).

50. *Id.* at 1314.

51. *Id.* at 1315 (quoting *Kumho Tire Co. v. Carmichael*, 119 S. Ct. 1167, 1176 (1999)).

copyright, is nothing more than myth.”⁵² *Pitney Bowes*’s holding, that a careful and correct claim construction must be educated by information concerning the relevant technology and the patent process itself, is simply a recognition of reality.

Some courts have sought innovative approaches to alleviating the difficulties created by their status as laypersons in the realm of patent interpretation. A few judges have begun to incorporate the services of a neutral expert or technical advisor into the Markman hearing to help the court understand the relevant technology or terms of art. Such experts may be appointed under the court’s inherent authority to appoint such advisors, or they may be appointed under Federal Rule of Evidence 706.⁵³ For example, a district court in Massachusetts, recognizing that it lacked “an adequate basis in skill or knowledge of the relevant art to draw definitive conclusions,” appointed a technical advisor upon whom both parties had agreed.⁵⁴ Another court likewise appointed such an advisor, concluding that the advisor could “act as a sounding board for the court’s assessment of the scientific significance of the evidence” and help the court determine “the validity of any scientific evidence, hypothesis or theory on which the experts base their testimony.”⁵⁵ In yet another case, a court appointed a Rule 706 neutral expert who both testified at the Markman hearing and issued a written report.⁵⁶ The court relied on the expert’s report for understanding the technology at issue⁵⁷ and on her testimony in construing the claims, regarding the testimony as “extrinsic evidence.”⁵⁸

Regardless of what solution courts are turning to for more information and background, the important point is that they seem to need and want as much technical help as they can obtain. The courts are correct in this desire because a well-informed claim construction is more likely to be the right one. And *Pitney Bowes* has expressly

52. David W. Plant, *The Lessons of Markman’s Progeny*, ADR CURRENTS, Dec. 1998, at 13.

53. See *Reilly v. United States*, 863 F.2d 149, 155–56 (1st Cir. 1988). Under the procedures set forth in Rule 706, the court must provide to the expert a written description of his or her duties, communicate the expert’s findings to the parties, and allow the parties to cross-examine the expert. See FED. R. EVID. 706(a). In addition, the parties may depose the expert and call him or her to testify in court. See *id.*

54. *MediaCom Corp. v. Rates Tech., Inc.*, 4 F. Supp. 2d 17, 29 (D. Mass. 1998).

55. *Biogen, Inc. v. Amgen, Inc.*, No. CIV.A.95-10496-RGS (D. Mass. Dec. 10, 1996) (memorandum and order for the Engagement of Technical Advisor), reprinted in *MediaCom Corp. v. Rates Tech., Inc.*, 4 F. Supp. 2d 17, 35–36 (D. Mass. 1998).

56. See *Genentech, Inc. v. Boehringer Mannheim GmbH*, 989 F. Supp. 359, 361–65 (D. Mass. 1997).

57. See *id.* at 368.

58. *Id.* at 364–65.

acknowledged the legitimacy and appropriateness of courts' use of extrinsic evidence.

The need for extrinsic evidence also has important implications for the timing of the *Markman* hearing. Because such information is either easier or harder to obtain depending on the timing and nature of the claim interpretation, courts must consider the extent to which it will be available as they decide *when* to resolve claim disputes.

D. Appellate Review of Claim Interpretations

Although, according to the Federal Circuit and the Supreme Court, *Markman* should have ushered in greater uniformity, predictability, and certainty in patent litigation, many believe that the holding has had the opposite effect. This is largely because Federal Circuit review of claim interpretation is *de novo*.

In *Cybor Corp. v. FAS Technologies, Inc.*,⁵⁹ Judge Rader pointed to the high reversal rate in the Federal Circuit in 1997, noting that the court had “reversed in whole or in part 53% of the cases from district courts.”⁶⁰ Judge Rader further described a study that had reported that, since *Markman*, the Federal Circuit had reversed, in whole or in part, forty percent of claim interpretations by district courts.⁶¹ He concluded that such a reversal rate provides “no . . . certainty at all” and merely “opens the bidding,” thus making it the least optimal rate.⁶² In fact, as he noted, a claim’s meaning remains uncertain until “nearly the last step in the process” — decision by the Federal Circuit.⁶³ “To get a certain claim interpretation, parties must go past . . . every step in the entire course of federal litigation, except Supreme Court review.”⁶⁴

Markman’s ostensible rejection of extrinsic evidence in claim interpretation plays a role in the Federal Circuit’s high reversal rate. The court’s conclusion that only intrinsic evidence should be used to interpret patent claims is consistent with the idea that the Federal Circuit is as able as (or more able than) trial judges to complete the task.⁶⁵ When claim

59. 138 F.3d 1448 (Fed. Cir. 1998) (en banc).

60. *Id.* at 1476 (Rader, J., dissenting).

61. *See id.* at 1476 & n.4.

62. *Id.* at 1476.

63. *Id.*

64. *Id.* As Judge Rader further noted, “[e]ven a rate that was much higher would provide greater certainty.” *Id.*; see also Margaret Cronin Fisk, *Confusion Follows '96 Landmark Patent Case*, NAT’L L.J., June 15, 1998, at A1, A20 (observing that, although *Markman* appears to have resulted in increased summary judgments in patent infringement cases, finality has been elusive “because of the high reversal rate for claim interpretations”).

65. *See Rana, supra* note 25, at 14.

construction relies only on intrinsic evidence, there is little basis for deferring to the determinations of the district court⁶⁶ because the district court is no more able than the appeals court to evaluate the intrinsic evidence.⁶⁷

Also contributing to the lack of certainty is the fact that, although claim construction is an interlocutory decision,⁶⁸ and Markman hearings have become prevalent, there has not been interlocutory review of trial judges' claim interpretations.⁶⁹ As Judges Newman and Mayer noted in 1998, "[t]he Federal Circuit has thus far declined all such certified questions."⁷⁰ The result, according to some commentators, is that "district courts have had to conduct unnecessary trials and sometimes have had to conduct a second trial after the claim is interpreted on appeal after final judgment."⁷¹

Moreover, although the Federal Circuit in *Markman I* pointed to predictability and uniformity as significant goals that would be furthered by claim interpretation being a matter of law, the fact is that such

66. Cf. Plant, *supra* note 52, at 13 ("Not surprisingly, the [Federal Circuit] judges who reject extrinsic evidence reverse district court claim constructions about three times as frequently as judges who accept such evidence and endorse deferring to the district court.").

67. Thus, for example, in *J.T. Eaton & Co. v. Atlantic Paste & Glue Co.*, 106 F.3d 1563, 1570, 1572 (Fed. Cir. 1997), the Federal Circuit rejected not only the trial judge's claim interpretation but also the interpretation advocated by the parties and every expert witness who testified at trial. Instead, the Federal Circuit based its interpretation on a brief excerpt from a single declaration at the end of a voluminous prosecution history. In *CVI/Beta Ventures, Inc. v. Custom Optical Frames, Inc.*, 893 F. Supp. 508, 519–23 (D. Md. 1995), a Maryland district court interpreted the claims of the patent at issue and granted the patentees' motion for preliminary injunction. The Federal Circuit reviewed this claim interpretation and affirmed it in a nonprecedential opinion. See *CVI/Beta Ventures, Inc. v. Custom Optical Frames, Inc.*, No. CIV.A.96-1070, 1996 WL 338388 (Fed. Cir. June 19, 1996). In a separate infringement action involving the same patent, a New York district court reached the same conclusions regarding the claim interpretations as did the Maryland court, which allowed the patentee to prevail. See *CVI/Beta Ventures, Inc. v. Tura LP*, 905 F. Supp. 1171, 1175–89, 1192 (E.D.N.Y. 1995). But on appeal, the Federal Circuit found error in the district court's claim interpretation and reversed. See *CVI/Beta Ventures, Inc. v. Tura LP*, 112 F.3d 1146, 1152–62 (Fed. Cir. 1997). The Federal Circuit thus reversed itself on what *Markman* and *Markman I* teach is a question of law.

68. See *Vivid Techs., Inc. v. American Science & Eng'g, Inc.*, 997 F. Supp. 93, 95 (D. Mass. 1997).

69. See *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1479 (Fed. Cir. 1998) (en banc).

70. *Id.*

71. Huttner et al., *supra* note 26, at 558; see also Gasparo, *supra* note 19, at 761–62 (noting that a Markman hearing "should be held before trial and coupled with a quick appellate review of the claim construction in order to circumvent any further inefficiency that may result from proceeding via a wrong construction").

predictability — predictability between cases — is achieved “at the expense of predictability within the first case.”⁷² As one observer has noted, “[o]nce the Federal Circuit has stated its interpretation of a claim, that interpretation should be followed in future litigation involving the same patent, based on stare decisis.”⁷³ At the same time, however, “predictability is decreased within the first case because the trial judge’s interpretation is more likely to be reversed.”⁷⁴ The result is that predictability is increased only if a patent is litigated more than once.⁷⁵

The uncertainty engendered by a de novo appellate review also has implications for the timing of Markman hearings. The inherently tentative nature of any claim construction by a district court — and the unavailability of interlocutory review of that claim interpretation — would seem to counsel against early interpretations on less than a fully developed record. Instead, the better practice for district courts would appear to be to defer claim interpretation until it is required for a particular purpose (that is, summary judgment or instructions to the jury), and the record before the court is as fully developed as possible.

E. Settlement

In the aftermath of *Markman*, some observers predicted that litigants would be more likely to settle in cases in which claim construction took place prior to trial because both parties would know whose case the claim construction supported and would be able to predict their chances of winning.⁷⁶ Yet it now appears that *Markman* has had the unintended effect of prolonging the litigation process rather than promoting settlement. The uncertainty that attaches to claim construction due to the Federal Circuit’s record of reversing a large percentage of claim interpretations on appeal often leads the parties to proceed with the trial in order that the Federal Circuit may review the district court’s interpretation. Furthermore, as discussed in the previous section, a claim interpretation that is unfavorable can be appealed only after trial when

72. Rana, *supra* note 25, at 15.

73. *Id.*

74. *Id.*

75. *See id.*

76. *See* Steven D. Glazer & Steven J. Rizzi, *Markman: The Supreme Court Takes Aim at Patent Juries*, 5 J. PROP. RTS. 2, 4–5 (1996). Of course, even when claims are litigated multiple times, there is no guarantee of uniformity. *See supra* note 67; *CVI/Beta Ventures, Inc. v. Tura, LP*, 112 F.3d 1146, 1152–60 (Fed. Cir. 1997) (finding error in the district court’s claim interpretation, even though that interpretation was itself based on an interpretation that the Federal Circuit had affirmed).

the entire case is appealed.⁷⁷ In addition, the district court itself may later alter its claim interpretation, especially in cases in which claim construction is done prior to discovery, such as in tandem with the adjudication of a motion for a preliminary injunction.⁷⁸

Markman has hampered settlement in another way: when the claim interpretation is favorable to the patent holder, the prospects of recovery increase, and, in the words of one patent lawyer, "the defendants feel they have to go to trial."⁷⁹ Once again, the high rate of reversal at the next level reinforces for defendants that they will have another opportunity for success further down the road.⁸⁰ The overall effect is that "judges' interpretations of patent claims have often spurred intransigence rather than a rush to settle."⁸¹ The result for the question of timing is that the possibility of settlement provides no reason for courts to decide claim interpretation issues earlier than they might otherwise.

III. TIMING

Just as the issues presented above have proven controversial, the procedure that judges should follow in interpreting claims has also proved to be a subject of scholarly and judicial debate. A particular source of confusion has been the issue of when during in the litigation process a court should interpret the patent claims in dispute.⁸² This Part

77. See Fisk, *supra* note 64, at A20 (quoting William F. Lee).

78. See Huttner et al., *supra* note 26, at 544; see also *Sofamor Danek Group, Inc. v. DePuy-Motech, Inc.*, 74 F.3d 1216, 1221 (Fed. Cir. 1996) ("*Markman* does not obligate the trial judge to conclusively interpret claims at an early stage in the case."); *International Comm. Material, Inc. v. Ricoh Co.*, 108 F.3d 316, 318 (Fed. Cir. 1997) (acknowledging that the district court's claim construction was only "tentative" because there remained "substantial open issues and questions that must be litigated"); *Vivid Techs., Inc. v. American Science & Eng'g, Inc.*, 997 F. Supp. 93, 95 (D. Mass. 1997); *Nova Biomedical Corp. v. i-STAT Corp.*, 980 F. Supp. 614, 616 (D. Mass. 1997). Other courts, by contrast, have deemed their early interpretations conclusive. See *Boehringer Ingelheim Animal Health, Inc. v. Schering-Plough Corp.*, 984 F. Supp. 239, 245-53 (D.N.J. 1997), and No. CIV.A.96-04047, 1998 WL 271764, at *3 (D.N.J. Apr. 27, 1998).

79. Fisk, *supra* note 64, at A20 (quoting Roy E. Hofer).

80. See *id.*

81. *Id.* at A1.

82. There is a distinction between the optimal time for a *Markman* hearing from the perspective of the litigants and the optimal time from the perspective of the court. That is, whereas the optimal time for the litigants depends on the particular strengths and weaknesses of the specific issues in the case, the court's evaluation is instead based on an institutional perspective. The discussion that follows weighs the pros and cons of various timing possibilities from an institutional and judicial efficiency perspective, attempting to encompass considerations that are important for both the court and the parties.

reviews the options available to judges as they consider the timing issue, and argues that the optimal time for claim construction is when the court considers the parties' motions for summary judgment. It begins in the following section by establishing that conducting a hearing for the purpose of construing claims is preferable to interpreting claims on the basis of the paper record alone.

A. Hearing vs. Paper Record

As an initial matter, a court may interpret the claims on the basis of the paper record alone, in the context of a hearing with attorney argument only, or in a hearing that includes both attorney argument and testimony from witnesses. The court may construe the claims only on the basis of the paper record, for example, in the course of deciding a motion for summary judgment on an issue involving claim construction.⁸³ In such situations, the court may consider extrinsic evidence in the form of technical treatises, deposition testimony of witnesses, and affidavits by expert witnesses.⁸⁴

Ideally, claim construction takes place in the context of a hearing, whether with attorney argument only or with witness testimony as well. The hearing gives the court an opportunity to hear, evaluate, and question the argument by counsel and/or the testimony from expert witnesses regarding the meaning of the disputed terms in the patent claims.⁸⁵ These advantages also accrue if claim construction takes place during the jury trial itself.

The disadvantage of holding a separate evidentiary hearing for claim construction issues is that the court must in essence hold two trials, and the expert witnesses often have to testify twice regarding the same issues — once before the court and once before the jury.⁸⁶ This not only increases the burden on already-overloaded district courts; it also increases litigation costs borne by the parties and the demands on expert witnesses.⁸⁷ These problems are avoided when the court construes the claims on the basis of the paper record. Furthermore, in such situations the court may still receive argument and expert testimony through affidavits and declarations submitted by the parties.

83. See Lee & Stoner, *supra* note 17, at 661–62; Sutton et al., *supra* note 45, at 891.

84. See *Elf Atochem N. Am., Inc. v. Libbey-Owens-Ford Co.*, 894 F. Supp. 844, 848 (D. Del. 1995).

85. See *Loral Fairchild Corp. v. Victor Co. of Japan*, 911 F. Supp. 76, 79 (E.D.N.Y. 1996) (observing that a judge faced with “conflicting views of technical terms may prudently enlist the aid of qualified experts to determine the meaning of the claim terms”).

86. See Lee & Stoner, *supra* note 17, at 663.

87. See *id.* at 663–64.

Relying only on a stack of documents to construe the claims, however, deprives a court of the benefit of being able to ask questions of the attorneys or the expert witnesses. Although that result may be acceptable when none of the disputed claim terms is ambiguous, the question and answer format of a hearing is often crucial when a claim term is ambiguous. And, in virtually every case, when the district court endeavors to divine the meaning of a claim term, it confronts ambiguity in the term. The complexity of the technical issues in most patent infringement litigation⁸⁸ and the likelihood that the patent documents alone may not be fully explanatory mean that it is often preferable for courts to hear arguments or expert testimony prior to construing the claims.⁸⁹ Thus, unless the court is certain that none of the claims is ambiguous, conducting a Markman hearing, even without regard to when in the litigation it takes place, is undoubtedly preferable to construing the claims on the basis of the paper record alone.⁹⁰

Assuming that holding a Markman hearing is the most appropriate means of resolving claim construction issues, the question of when to hold the hearing remains subject to substantial debate. District courts have discretion to determine when and in what format claim interpretation will take place.⁹¹ They may construe the claims "anytime after the defendant has answered and prior to entry of judgment."⁹² Although some courts charged with interpreting patent claims have declined to hold Markman hearings at all,⁹³ most courts have held them.⁹⁴

88. See HERBERT F. SCHWARTZ, *PATENT LAW AND PRACTICE* 130 (2d ed. 1995).

89. See Bailey, *supra* note 26, at 345-46; Lee & Stoner, *supra* note 17, at 662-63; see also Moll v. Northern Telecom, Inc., No. CIV.A.94-5451, 1995 WL 733389, at *10-11 (E.D. Pa. Dec. 11, 1995).

90. See *Northern Telecom*, 1995 WL 733389, at *3, *10-11 (denying a partial summary judgment motion requiring claim construction until a Markman hearing was held and a "more developed record" was established).

91. See Huttner et al., *supra* note 26, at 539.

92. Sutton et al., *supra* note 45, at 891.

93. See Fisk, *supra* note 64, at A20 (quoting James H.A. Pooley); see also *Interactive Gift Express, Inc. v. CompuServe Inc.*, No. CIV.A.95-6871, 1998 WL 247485, at *1 n.3 (S.D.N.Y. May 15, 1998) ("The court notes at the outset that no Markman hearing is needed in this case because the court does not require expert or other testimony to aid it in its claim construction."); *LRC Elecs., Inc. v. John Mezzalingua Assocs., Inc.*, 974 F. Supp. 171, 182 (N.D.N.Y. 1997) (holding that no hearing was needed to interpret a single disputed claim term, even though that term was ambiguous); *Brosnan v. Rollerblade, Inc.*, No. CIV.A.97-0782, 1998 WL 209155, at *3 (N.D. Cal. Apr. 27, 1998).

94. See John B. Pegram, *Markman and Its Implications*, 78 J. PAT. & TRADEMARK OFF. SOC'Y 560, 566 (1996); ABA Intell. Prop. Litig. Subcommittee, *Survey Results of Markman Proc.*, 1996-1997 Annual Report [hereinafter ABA Survey].

Among those courts utilizing Markman hearings, the timing of the hearing has been greatly inconsistent.⁹⁵ According to a survey of *Markman* procedures conducted by the Intellectual Property Law Section of the American Bar Association, most judges interpret the disputed patent claims prior to trial.⁹⁶ Of those judges, most hold the Markman hearing near the close of discovery or during the period in which dispositive motions are filed. Other courts wait until they have heard all of the evidence during the trial to determine the meaning of the claims.⁹⁷ Indeed, the Federal Circuit has stated that “*Markman* does not obligate the trial judge to conclusively interpret claims at an early stage in a case. A district court may exercise its discretion to interpret the claims at a time when the parties have presented a full picture of the claimed invention and prior art.”⁹⁸

A variety of options are available to district courts as they determine when to hold a Markman hearing. They may hold the hearing at the outset of the case — that is, prior to the completion of any discovery — or during factual discovery. Alternatively, they may hold the hearing after discovery — an option which, in turn, encompasses four possibilities: claims may be interpreted after fact discovery is complete but before expert discovery has been conducted, after all discovery is complete, at the time that the summary judgment motions are filed, or just before opening arguments in the trial. A final option is to interpret the claims during trial at the close of evidence, prior to instructing the jury.⁹⁹

95. See Fisk, *supra* note 64, at A20.

96. See Sutton et al., *supra* note 45, at 891; ABA Survey, *supra* note 94.

97. See, e.g., *Ajinomoto Co. v. Archer-Daniels-Midland Co.*, No. CIV.A.95-218-SLR, 1998 WL 151411 (D. Del. Mar. 13, 1998) (bench trial); *Johns Hopkins Univ. v. Cellpro*, 931 F. Supp. 303 (D. Del. 1996) (jury trial).

98. *Sofamor Danek Group, Inc. v. DePuy-Motech, Inc.*, 74 F.3d 1216, 1221 (Fed. Cir. 1996).

99. The Federal Circuit has also suggested that it is permissible for district courts to construe claims after the trial is complete. See *Markman I*, 52 F.3d at 981. For example, post-trial claim construction, which occurred in *Markman*, may be done in the context of a motion for judgment as a matter of law. See *Laitram Corp. v. NEC Corp.*, 62 F.3d 1388, 1394 (Fed. Cir. 1995) (holding that, because claim interpretation is a legal issue, the court may regard the jury’s claim interpretation as an advisory determination). Thus, it may be acceptable for a court to “submit the claim interpretation to the jury, obtain an advisory opinion, and then defer the Court’s interpretation to post-trial motions.” Bailey, *supra* note 26, at 348.

Although such a procedure accords with the court’s dictates in *Markman I*, construing the claims after the completion of the trial is not advisable because it is inconsistent with the Federal Circuit’s warning that the district court in *Markman* “should have instructed the jury as to the meaning of the claims.” Bailey, *supra* note 26, at 348 (quoting *Markman I*, 52 F.3d at 981–82).

The remainder of this Part focuses on these options. Section B concludes that the disadvantages of resolving claim disputes during the trial outweigh the advantages such that the post-trial option fades from the spectrum of practical choices. The remaining sections evaluate pre-trial claim construction hearings. The primary question in this analysis is whether the hearing should occur at the outset of the case, just before trial, or somewhere in between. Thus, Section C considers the viability of holding the claim construction hearing prior to discovery, while Section D evaluates the relative merits of post-discovery claim construction. Finally, Section E breaks down post-discovery claim construction into four timing options: after fact discovery but before expert discovery, after all discovery, at the time summary judgment motions are considered, or just before opening arguments in the trial. It further explains why the most desirable time for holding a Markman hearing is concurrent with the court's consideration of the parties' inevitable summary judgment motions.

B. Post-Trial Claim Interpretation

District court judges may construe the patent claims sometime during the trial, such as just prior to instructing the jury at the close of evidence.¹⁰⁰ In this approach, all evidence, including that relating to claim construction, is heard at a single trial before both the judge and the jury. Expert witnesses testify both as to infringement and validity and, possibly, as to their interpretation of the disputed patent claims. Once all of the evidence has been presented, "the court, presumably in connection with requests for jury instructions from the parties and after a charge conference, formulates its views on claim interpretation and instructs the jury thereon at the same time the other jury instructions are given."¹⁰¹ The court also would presumably instruct the jury to disregard evidence rendered irrelevant by the court's claim construction. The jury would then make the determination as to infringement and validity.

Part of the rationale behind a later hearing is that, in cases in which "significant liability questions" remain after the claims have been interpreted, stopping early to interpret the claims merely postpones the trial and the resolution of the litigation.¹⁰² Thus, deferring interpretation until the last possible moment promotes efficiency in the expenditure of

100. See, e.g., *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1580 (Fed. Cir. 1996); *Exxon Chem. Patents, Inc. v. Lubrizol Corp.*, 64 F.3d 1553, 1555 (Fed. Cir. 1995); *Johns Hopkins Univ. v. Cellpro*, 894 F. Supp. 819, 826 (D. Del. 1995).

101. *Lee & Stoner*, *supra* note 17, at 664.

102. See *Binney & Myricks*, *supra* note 26, at 162.

judicial resources.¹⁰³ The strongest reason for interpreting claims at a later stage, however, is that the judge may be in the best position to resolve disputes as to the meaning of claims only after he or she has heard the entirety of the evidence “in the context of the overall case”¹⁰⁴ and thereby understands “not only what the parties assert as to the meaning of the claims, but also how those meanings affect the entire case.”¹⁰⁵ The importance of the specific words in the patent documents “is often better understood when the background of the prior art, the history of the invention and the overall commercial setting are fully explained, as usually happens at trial.”¹⁰⁶ Much of this background is absent when the claims are interpreted during a separate Markman hearing because courts in such cases have a strong incentive to minimize the use of evidence that must in any event be presented at trial.¹⁰⁷ And parties will accordingly limit the evidence they present.¹⁰⁸ The presumed effect of these factors is that, prior to trial, the information will be presented in a more restricted manner, and the judge will likely have a circumscribed appreciation of the patented innovation’s history and the range of prior art.¹⁰⁹

However, late claim interpretation is accompanied by more disadvantages than advantages. As an initial matter, the practical effect of a court’s decision to construe the claims only after hearing all of the evidence is that the court may well be unable to instruct the jury until after a delay of several days, during which it interprets the claims.¹¹⁰ In the period of time after the close of the evidence and before jury instructions are given, the judge has to review all of the evidence, hear arguments on the relevant legal issue, and interpret the claims.¹¹¹ This means that the jury must wait, perhaps several days, for the judge to complete this process, during which time the evidence loses its freshness

103. See Lee & Stoner, *supra* note 17, at 665.

104. George E. Badenoch, *Proceeding in the Gray Area After Markman*, INTELL. PROP. STRATEGIST, June 1996, at 4.

105. Binney & Myricks, *supra* note 26, at 162.

106. Badenoch, *supra* note 104, at 5.

107. See *id.* at 4.

108. See Binney & Myricks, *supra* note 26, at 162.

109. See *id.*; see also Gasparo, *supra* note 19, at 745 n.98 (noting that a late interpretation allows the court “to hear a more complete and thorough array of evidence throughout the progression of an entire trial”); Sutton et al., *supra* note 45, at 893 (observing that late claim interpretation permits the court “to fully consider and weigh all the evidence concerning claim construction prior to issuing its decision”); see, e.g., Johns Hopkins Univ. v. Cellpro, 894 F. Supp. 819 (D. Del. 1995) (issuing on the final day of trial an opinion that included jury instructions on claim construction); Lucas Aerospace, Ltd. v. Unison Indus., LP, 890 F. Supp. 329, 332 n.3 (D. Del. 1995).

110. See Pegram, *supra* note 94, at 566.

111. See Lee & Stoner, *supra* note 17, at 668.

in their minds.¹¹² Thus, although late interpretation is efficient in the sense that it eliminates the need for a preliminary hearing for claim construction, it is inefficient in the sense that it can lengthen the trial.¹¹³ Moreover, when the court finally construes the claims, it may well adopt a claim interpretation different from those proposed by the parties. As a consequence, it may be necessary to resume the presentation of evidence in order to allow the parties to present evidence relevant to the claims as properly construed.¹¹⁴

More importantly, in cases in which the court does not construe the claims until after the close of evidence, the parties must offer evidence under the "correct" claim interpretation, whatever that might ultimately be.¹¹⁵ Such a format forces the parties to "provide testimony relevant to alternative claim constructions, including alternative theories of infringement"¹¹⁶ Doing so, however, makes an already complex proceeding still more complicated and will inevitably cause confusion for the jury.¹¹⁷ Yet avoiding the delay, complication, and confusion can be achieved only if the parties present their entire case based on a single claim construction — one that may turn out to be incorrect.¹¹⁸ It is thus doubtful that the parties will dare to base their case on a claim construction that has yet to be determined.¹¹⁹ As one commentator has observed, "[w]aiting until the close of evidence or the charging conference requires the litigants to proceed with the trial without knowing the most important ground rules, and either to 'roll the dice' on one hoped-for interpretation of the claims or present complex evidence under alternative claim construction theories."¹²⁰

An equally fundamental difficulty with postponing claim interpretation until trial derives from the fact that once the interpretation

112. See *Lucas Aerospace*, 890 F. Supp. at 332 n.3 (pointing out the conflict between the need not to create a "jury hiatus" and the importance of claim construction on the outcome of most patent cases).

113. See Sutton et al., *supra* note 45, at 893; Badenoch, *supra* note 104, at 5 (noting that late interpretation "lengthens and complicates" the trial).

114. See Huttner et al., *supra* note 26, at 539–40; see also *Elf Atochem N. Am., Inc. v. Libbey-Owens-Ford Co.*, 894 F. Supp. 844, 857 (D. Del. 1995) ("However, in a jury trial, delaying resolution of [claim construction] until trial may raise serious practical problems of how to adequately and fairly rule on these often difficult and vitally important issues at the close of evidence while a jury waits.").

115. See Sutton et al., *supra* note 45, at 897.

116. Huttner et al., *supra* note 26, at 548; see Badenoch, *supra* note 104, at 5 (observing that, to cover their bases, parties must "present evidence under alternative claim interpretations").

117. See Badenoch, *supra* note 104, at 5.

118. See *id.*

119. See *id.*

120. *Id.*

is complete, the judge must essentially have the jury disregard testimony that it has already heard.¹²¹ If the court “uses” the testimony of one of the testifying experts on the basis that the testimony was helpful in interpreting the claim, it is simultaneously rejecting as unhelpful the testimony of the other expert. However, because the jury has already heard the “other” expert’s testimony, there arises the question of what, if anything, the court should tell the jury about that testimony.¹²² The court could say nothing and leave the jury to surmise from the jury instructions that it should disregard the other expert’s testimony on the meaning of the claims, as well as any of the expert’s opinions that were based on that interpretation.¹²³ Alternatively, the court could strike the testimony of the other expert, and opinions premised thereon, instructing the jury to ignore it. A final option is for the court to instruct the jury that it may credit the testimony of the other expert to the extent that it is not based on the erroneous claim interpretation but that it should disregard that part of the testimony that concerns claim interpretation.¹²⁴

Whatever the court chooses, its acceptance of the testimony of one of the experts is an implicit indication that the other expert lacks credibility.¹²⁵ This is problematic because, under *Markman*, claim interpretation is not a factual determination. *Markman* appears to dictate that, when the experts have different opinions about the meaning of the terms, the court should construe the claims in accord with the testimony that is most congruous with the patent documents.¹²⁶ After all, under *Markman*, courts are not to choose between experts based on their credibility; rather, when a court accepts one expert’s testimony while rejecting the other’s, it “is not crediting certain evidence over other evidence.”¹²⁷ But this is a conundrum: the court receives expert testimony in the first place only because those documents are ambiguous. Thus, unless the court makes a credibility determination to construe the ambiguous claim terms, it is unclear what standards should guide the decision.¹²⁸

121. See Lee & Stoner, *supra* note 17, at 665.

122. See *id.* at 665–66.

123. See *id.*

124. See *id.*; see also Badenoch, *supra* note 104, at 5 (“[I]f the parties present testimony in support of their respective claim interpretations at trial and the district court later decides that issue and instructs the jury on the correct claim interpretation, the court will in effect be instructing the jury that one side’s expert is wrong on claim construction, thereby damaging that expert’s credibility on other issues as well.”).

125. See Lee & Stoner, *supra* note 17, at 665–66.

126. See *id.* at 666.

127. *Markman I*, 52 F.3d at 981.

128. See Lee & Stoner, *supra* note 17, at 668.

C. Pre-Discovery Claim Interpretation

Although a court may hold a Markman hearing either before or during trial, most judges believe that it is more efficient to hold it prior to trial. Early claim interpretation “may lead to resolution or disposition of many cases earlier in time and at far less expense to the litigants.”¹²⁹ Further, even if a pre-trial hearing does not dispose of the case, it at least permits the parties to determine the next step in the litigation process. After claim construction, the alleged infringer (assuming the court has adopted its interpretation) may wish to make a motion for summary judgment on the basis that there is no genuine issue of material fact on the issue of infringement. Because the claim construction informs the litigants which party is most likely to succeed at a jury trial, the parties may also have incentive to engage in settlement negotiations. Finally, even if the parties choose not to pursue any of these strategies, they will at least be in a better position to focus their trial strategies. But a court’s decision to hold a pre-trial Markman hearing does not end the inquiry. There remains the question of whether the hearing should be held prior to or during discovery, sometime after fact or expert discovery has been completed, or just prior to trial.

Some courts that have held the hearing prior to discovery have reasoned that early claim construction enables the parties and the court to “focus discovery in a way that makes more efficient use of party and court resources as the case proceeds.”¹³⁰ Discovery into various “validity defenses and the preparation of ‘alternative’ cases, depending on which interpretation is adopted, can be deferred and perhaps avoided altogether.”¹³¹ From this perspective, holding Markman hearings after the close of discovery, as has been customary for some courts,¹³² is inefficient because of the possibility that parties will find it necessary to modify their theories and to conduct additional discovery to support those theories.¹³³ Likewise, any expert reports that may have been

129. Binney & Myricks, *supra* note 26, at 162.

130. Huttner et al., *supra* note 26, at 538 (citing as an example *Vivid Techs., Inc. v. American Science & Eng’g, Inc.*, 997 F. Supp. 93, 95 (D. Mass. 1997)); *see also* Letter from Jeffrey I.D. Lewis, Senior Partner, Patterson, Belknap, Webb & Tyler, to Members of the Markman Procedures Subcommittee of the AIPLA Federal Litigation Committee 2 (Feb. 3, 1999) (on file with the *Harvard Journal of Law & Technology*) (noting that an early hearing “galvanizes the issues that need to be addressed during discovery”).

131. Binney & Myricks, *supra* note 26, at 162.

132. *See, e.g.*, *ADC Telecomms., Inc. v. Siecor Corp.*, 954 F. Supp. 820 (D. Del. 1997); *Comark Communications, Inc. v. Harris Corp.*, No. CIV.A.95-2123, 1998 WL 150946 (E.D. Pa. Mar. 30, 1998).

133. *See* Huttner et al., *supra* note 26, at 539.

prepared prior to the formulation of the new theories may need to be revised.¹³⁴ In addition, an early hearing may also promote settlement.¹³⁵

Some district courts have institutionalized a practice of holding so-called “Markman trials” early in cases. In order to establish a “uniform set of procedures” and to “reduce the occasion for numerous and conflicting Standing Orders by individual judges,”¹³⁶ the Northern District of California promulgated local rules for Markman hearings. These rules require that the party alleging infringement submit a Proposed Claim Construction Statement early in the case, with the alleged infringer responding sixty days later with its own Claim Construction Statement.¹³⁷ These documents must state all “uncommon meanings of words or phrases in the claim” and must provide all references contained in the specification, in the prosecution history, or in extrinsic evidence that “support, describe, or explain each element of the claim.”¹³⁸ The parties must next prepare a Joint Claim Construction Statement, which must contain a list of claims that the parties agree upon, along with each party’s version of the disputed claims.¹³⁹ If the parties plan to call more than one witness, they must identify each of the witnesses and the subject matter of each of the witness’s testimony.¹⁴⁰ The court then must set a date for the hearing, and the parties must comply with a briefing schedule.¹⁴¹ Because, under these rules, the parties must adhere to a variety of mandatory initial disclosures, the discovery process is more productive.¹⁴² As one commentator has pointed out, “[t]he result of such local rules will be to provide a judge with an effective evidentiary procedure to construe claims as a matter of law. This is precisely what is needed to make the process more efficient as well as expeditious.”¹⁴³

134. *See id.* (citing *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1475 n.2 (Fed. Cir. 1998) (en banc) (Rader, J., dissenting); *Loral Fairchild Corp. v. Victor Co. of Japan*, 911 F. Supp. 76, 79 (E.D.N.Y. 1996)).

135. This effect is only speculative, however, as the Federal Circuit’s frequent reversals of trial judges’ claim interpretations militate against settlement. *See supra* text accompanying notes 76–81.

136. N.D. CAL. R. 1–2(a).

137. *See* William F. Lee, *The Ever Confounding Question of Claim Construction: Markman and its Progeny*, in *PATENT LITIGATION 1998*, at 151, 176 (PLI Patents, Copyrights, Trademarks, & Literary Property Course Handbook Series No. 531, 1998); N.D. CAL. R. 16–10.

138. N.D. CAL. R. 16–10.

139. *See* N.D. CAL. R. 16–11.

140. *See id.*

141. *See id.*

142. *See* Gasparo, *supra* note 19, at 755.

143. *Id.* at 755–56.

Although pre-discovery claim interpretation may encourage settlement and, more importantly, focus discovery, ultimately its inefficiencies outweigh those benefits. In particular, prior to discovery, more claim limitations are in dispute, and there is generally more disagreement among the parties regarding the nature of the litigation. Thus, pre-discovery claim construction forces judges to analyze claim limitations in the abstract, before the parties have a clear idea of what is at stake in the litigation and what terms will prove decisive in the case. Early claim interpretation is especially senseless when one considers the likely scenario that the interpretation of only one limitation may decide the whole case.

To be sure, in the minority of cases in which the relevant technology and the state of the art are less complex and in which the key issues concern claim construction, it may seem logical for the court to construe the claims early in the litigation.¹⁴⁴ But even in such cases, late claim interpretation may be more desirable. If the case is a simple one, presumably discovery will not be unduly burdensome and will provide the benefit of making evident *which* claim limitations are most important. And, more importantly, post-discovery claim construction will be more definitive because the court will have a more complete context and more background information for determining the meaning of the terms.

D. Post-Discovery Claim Interpretation

Although pre-discovery Markman hearings may be appropriate in some cases, holding the hearing at some point after fact discovery is usually a better option.¹⁴⁵ Because an early (pre-discovery) hearing “will not necessarily include all of the relevant prior art and other materials” that may be available later, it may result in inefficiencies that could be avoided by waiting to interpret claims at least until the close of fact discovery.¹⁴⁶ When the Markman hearing is held before trial but after fact discovery, by contrast, the parties “have learned what they need to

144. See Binney & Myricks, *supra* note 26, at 185 (“[W]here the technology is reasonably simple, and where the key issues revolve around claim interpretation, it may be in both parties’ interest to push for an earlier resolution of these issues, rather than undergoing discovery on the entire range of issues which present themselves in most patent litigation.”).

145. As mentioned above and discussed in the following section, there are four points following fact discovery and before trial during which claim construction could take place: after fact discovery but before expert discovery, after all discovery, at the time of summary judgment, or just prior to opening arguments in the trial.

146. Lewis, *supra* note 130, at 2.

know about the case to fully understand and articulate their positions.”¹⁴⁷ They will be able to provide the judge with the factual background required for an understanding of the issues to be decided in claim construction.¹⁴⁸ And, most importantly, they will have identified which terms are in dispute. Thus, post-discovery claim interpretation presents the first opportunity for the parties and the court to focus on what is really at stake in the litigation. It renders claim construction more efficient because, by the time fact discovery is complete, the parties know the decisive issues in the litigation and are able to inform the court accordingly. The court need not waste time and effort on a claim construction that turns out to be irrelevant to the case.¹⁴⁹

Because at the post-discovery stage the resolution of a claim dispute is based on ample information, the court will most likely hold to that interpretation for the remainder of the case — an outcome that is less certain with earlier claim construction. Thus, if the judge interprets the claim in favor of the plaintiff, infringement often “isn’t seriously contested” because claim interpretation issues are at the crux of many patent cases.¹⁵⁰ If, by contrast, the interpretation favors the defendant, “often there is frequently either no infringement or anticipation by prior art becomes easy to prove.”¹⁵¹ Even if the court denies summary

147. Binney & Myricks, *supra* note 26, at 184 (“The ideal timing for a Markman hearing is probably shortly after the close of discovery, probably about sixty days before trial, which is about the time when the Court will be considering summary judgment motions.”).

148. *See id.*

149. In addition, one court has suggested that, in situations in which the parties have not yet determined which claims are in dispute, and the court construes the claims in the abstract, the claim interpretation may violate the Constitution’s “case and controversy” limitation on judicial power and render the court’s interpretations merely advisory. *See MediaCom Corp. v. Rates Tech., Inc.*, 4 F. Supp. 2d 17, 22, 24 n.6 (D. Mass. 1998) (observing that the Markman hearing “should take place in the context of conventional motion practice” because “[f]ree-standing Markman hearings” may “run afoul of the ‘case and controversy’ limitation”).

150. Binney & Myricks, *supra* note 26, at 161; *see also* Pegram, *supra* note 94, at 566–67; *Thorn EMI N. Am., Inc. v. Intel Corp.*, 936 F. Supp. 1186 (D. Del. 1996) (holding a Markman hearing and ruling on the basis of the construction that no infringement occurred); *Loral Fairchild Corp. v. Victor Co. of Japan*, 911 F. Supp. 76 (E.D.N.Y. 1996) (granting one party’s motion for summary judgment after holding a Markman hearing and issuing an order and opinion as to claim construction). Proceeding in this way probably does not allow enough time to “arrange the proceedings for an expedited appeal of the court’s claim construction before trial.” Pegram, *supra* note 94, at 566. This shortcoming is of little moment, however, because the Federal Circuit has granted only a small number of interlocutory appeals of a district court’s claim construction.

151. Binney & Myricks, *supra* note 26, at 161. *But see* Fisk, *supra* note 64, at A20 (noting that “[i]f the defendant loses significant points on the claims interpretation, . . .

judgment because there remains after interpretation a genuine issue as to infringement, the parties will at least have agreed on what is disputed and what is not.¹⁵²

E. Optimal Time for Claim Interpretation

Even within the realm of post-discovery Markman hearings, there are a number of timing alternatives. First, the court could hold the hearing at the close of fact discovery, but prior to expert discovery. Second, the hearing could be held after all discovery, including expert discovery, has been completed. The third option available to the court is to hold the hearing in tandem with its consideration of the parties' summary judgment motions. Finally, the hearing could take place just prior to opening arguments. All four options have the advantages of post-discovery claim interpretation outlined in the previous section, but, as this section explains, the third is optimal.

1. After Fact Discovery

The first option — interpreting the claims after fact discovery but prior to expert discovery — has the advantage that the experts giving their opinion as to the issues of infringement or invalidity have the benefit of the court's claim construction. Accordingly, they are able to base their opinions on the court's actual interpretations, rather than rendering multiple opinions on the basis of speculation about what the interpretations ultimately could be. And that, of course, is the drawback to the final three options: when claim construction takes place after *both* fact and expert discovery, the expert must provide a variety of opinions, depending on how many possible claim constructions there are, and does not have the benefit of knowing the definitive meaning of the claims.

Yet holding the Markman hearing after expert discovery is complete is preferable, despite this disadvantage. During discovery, the testifying experts will render an opinion as to the issue of infringement or invalidity and, in the process, will presumably testify as to the plausible interpretations of the claims and the relevant technology. Such testimony will help to educate the parties about the claims at issue and, by the parties' motions and arguments, the court as well. By holding the claim construction hearing after expert discovery is complete, the experts will be able to educate and ultimately benefit the court as it interprets the

'[it] could still have a noninfringement defense or an invalidity defense or even prevail on damages issues.'" (quoting Roy E. Hofer)).

152. See *infra* text accompanying notes 154–58.

claims. This contribution of knowledge is especially important to the court in light of the fact that judges are not skilled in the art of the technology of the patent whose terms they must interpret. They depend heavily on the knowledge of experts, among other sources of information, for insight into the nature of the invention at issue. This is precisely what *Pitney Bowes* expressly recognized.¹⁵³

2. After All Discovery

Because each of the final three options takes place after expert discovery, each serves to educate the claim construction process and to infuse it with additional information. Among these, however, the option of holding the hearing just after all discovery is complete — that is, after expert discovery but prior to the summary judgment stage — is undesirable because it requires the court to construe *all* of the claims in dispute. This increases the work of already overburdened courts, and, by virtue of the fact that claim construction is a particularly onerous task, the effect is consequential. In light of the substantial judicial and evidence-related resources that claim construction requires, if some of the claims in dispute do not absolutely have to be evaluated and interpreted to resolve the case, they should not be. By contrast, the task of claim construction can be pared down and accomplished more efficiently if the court employs the option of construing the claims at the time that it considers the parties' summary judgment motions.

3. At the Summary Judgment Stage

By the time the parties submit their motions for summary judgment, they will have had the time and necessary information to identify those claim limitations that are in dispute.¹⁵⁴ Construing the claims at the time of summary judgment has the added advantage that the court need resolve only those claim issues on which the summary judgment motions depend. If the court is able to grant summary judgment and thereby dispose of the litigation, it need not construe the remaining disputed claim limitations. If summary judgment does not resolve the case, the court can construe the remainder of the disputed claim limitations prior

153. See *supra* text accompanying notes 46–51.

154. In certain cases the parties could move for summary judgment on a dispositive issue early in the discovery phase of the case. Such a procedure makes sense, however, only if the parties focus the court on one or two key claim limitations that could result in summary judgment. It would not be appropriate in a situation in which the court would be required to construe all or even several claim limitations.

to opening arguments at trial.¹⁵⁵ By implication, then, the fourth option — holding the hearing just prior to opening arguments — is too late in the litigation to produce the benefits that result from interpretation at the time summary judgment motions are considered.

The patent dispute between Biogen, Inc. and Berlex Laboratories, Inc.,¹⁵⁶ which is being litigated in the District of Massachusetts, provides an example of this approach toward claim construction.¹⁵⁷ Prior to the court's consideration of the parties' summary judgment motions, the parties provided to the court written submissions concerning the basic technology at issue and the patent prosecution process in general, and describing the key legal issues. The court then held a one-day hearing to do nothing other than hear this basic background information. With the information from the technological presentation complete, the court was prepared to construe the claims jointly with its evaluation of whether summary judgment was proper. In their summary judgment motions on the issue of non-infringement of the patents, the parties expressly directed the court to those claim limitations that would be decisive for resolving the case on summary judgment. Though noting that other claim limitations were also in dispute, the parties pointed out that deciding issues presented in the motion did not require interpreting those other disputed claims. Only the court's denial of summary judgment for one of the parties would require the court to interpret the remaining disputed claims that were not relevant to summary judgment.¹⁵⁸

Timing the Markman hearing to coincide with the summary judgment stage also accommodates other issues, discussed in Part II, that courts and litigants must balance against each other: the use of extrinsic evidence, uniformity and certainty, and the desirability of settlement. First, claim construction at the summary judgment stage balances the strictures on courts' use of extrinsic evidence with judges' need for such evidence in understanding the invention at issue. By the time claim

155. To the extent that, in interpreting the remaining disputed claims, the court requires additional extrinsic evidence and expert opinion, it has the discretion to ask the parties to submit supplemental expert reports.

156. *Berlex Labs., Inc. v. Biogen, Inc.*, No. 96-12487-MLW (D. Mass. filed April 30, 1999), No. 98-11728-MLW (D. Mass. filed April 30, 1999); *Biogen, Inc. v. Berlex Labs., Inc.*, No. 96-10916-MLW (D. Mass. filed April 30, 1999).

157. See Memorandum of Biogen, Inc. in Support of Motion for Summary Judgment of Non-Infringement of "Single Construct" Claims of the '567 Patent (D. Mass. 1999) (No. 96-10916-MLW).

158. This recommendation will be effective, however, only if the litigants do their part in focusing on the decisive claim terms in their summary judgment motions. Unfortunately, litigants often do the opposite, filing mountainous briefs containing all conceivable arguments, including those that are best abandoned. This practice is at best inefficient and has resulted in judicial frustration with summary judgment.

construction takes place, the parties will have completed both fact and expert discovery, and, accordingly, will have discerned the disputed claims and the subset of those claims that are decisive for summary judgment. The parties will be able to focus the expert testimony as to claim construction on those decisive claims and thereby avoid spending their time and resources, or those of the court, on testimony about claims that are not relevant. As a result, expert testimony will be more helpful, thorough, and efficiently presented and will provide the court with information commensurate with the requirements of the interpretation. And, of course, the process of expert discovery will have produced other similarly focused information on which the court may rely as it construes the claims. To be sure, there is less information available at the post-discovery stage as compared to the jury instruction stage. But the measured nature of the information available to the court prior to trial is more in keeping with the spirit of *Markman* and the notion that claim interpretation should be conducted, to the extent possible, on the basis of the patent documents.

Second, the nature of the appellate review of district courts' claim interpretations also supports a summary judgment stage Markman hearing. Just as the necessity for extrinsic evidence counsels against holding the Markman hearing any earlier than at the summary judgment stage, the nature of the appellate review process counsels against holding the hearing any *later* than at summary judgment. Because review by the Federal Circuit is *de novo*, there is little reason for a district court to hear the entirety of evidence in the case before determining the meaning of the claim terms. The courts that have been reversed have not been exclusively those that used only scant extrinsic evidence; rather, it appears that reversal is a fate met by claim constructions completed through a wide array of procedures and on the basis of varying amounts of extrinsic information. Thus, the court's absorption of all of the evidence prior to interpreting the claims is a waste of courts' and the litigants' time, not to mention that of the jurors.

Finally, settlement is not deterred by holding the claim construction hearing at the summary judgment stage. Parties are more likely to settle after they have identified what is really at stake, which is possible only after at least some discovery. And, in any event, the timing of the Markman hearing most likely has far less impact on the willingness of the parties to settle than many commentators assumed immediately after *Markman* was decided.

IV. CONCLUSION

Markman has fundamentally changed the nature of patent litigation. As courts and litigants struggle to develop the most efficient (in the case of the courts) and advantageous (in the case of the parties) procedures for implementing the holding, they must balance the strictures on, and their need for, extrinsic evidence and the reality of de novo appellate review. This holds with regard to judges' and parties' considerations about the most desirable point in the litigation process for claim interpretation to take place. When all of these factors are placed in the analysis, there is generally one "right" time for a *Markman* hearing: after all discovery has been completed, at the time the court considers the parties' summary judgment motions. Although there may remain cases in which earlier interpretation is more desirable, courts could begin to calm the *Markman* storm by holding claim construction hearings, as a default practice, at the summary judgment stage of the litigation.