Enhancing Patent Disclosure for Faithful Claim Construction

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Repository Citation
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ENHANCING PATENT DISCLOSURE FOR FAITHFUL CLAIM CONSTRUCTION

by

Joseph Scott Miller

Claim construction jurisprudence is in disarray. The United States Court of Appeals for the Federal Circuit reverses trial court claim construction decisions at a worryingly high rate. The proportion of Federal Circuit claim construction opinions that include separate concurrences or dissents continues to grow. And the muddled mix of issues the Federal Circuit framed for en banc review in the Phillips case suggests that the court cannot reach consensus on what the central questions are, much less on how to answer them. Perhaps the path to adequately predictable claim construction is continued tinkering with the analytical constructs internal to the Federal Circuit's claim construction jurisprudence, but that is not likely. In this Article, the author takes a sharply different approach to the question, how can we make claim construction more predictable? Inspired by the maxim "garbage in, garbage out," he looks to the patent system actor that has plenary power, within the broad outline set by the Patent Act, over the details of all patent disclosures—namely, the Patent Office. Specifically, he examines additional, low-cost disclosures that would assist claim construction and that the Patent Office can demand from all patent applicants. Carefully chosen new disclosures would make all patents far more helpful tools in their own construction, providing social benefits that far outweigh the added patent preparation costs. In any subsequent claim construction process, whether for licensing, design-around, or litigation purposes, parties would have the benefit of patents enriched with this new information. The patent document, enhanced in this way, would better fulfill its role as claim construction's central resource.

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* Assistant Professor, Lewis & Clark Law School. I wrote this Article with the benefit of helpful and challenging suggestions from participants at the Tenth Annual Lewis & Clark Law School Fall Business Law Forum, entitled "Markman v. Westview Instruments: Lessons from a Decade Experience," and from Chris Cotropia, Tim Holbrook, Andy Johnson-Laird, Mark Lemley, Lydia Loren, and Jim Speta. Comments are welcome at jsmiller@lclark.edu.
"A review of the contemporary patent instrument cannot be a charitable one. In terms of their format and fit with the patent statute, modern patents do a woefully poor job of recording the proprietary interests of inventors."

— Prof. John R. Thomas**

I. INTRODUCTION

The modern U.S. patent system, which began in 1836 with the creation of the Patent Office,¹ is now 169 years old. The modern patent claim requirement is almost as old, having been codified in an 1870 amendment to the Patent Act.² When one reads, for example, the Supreme Court's 1877 claim construction decision in Merrill v. Yeomans,³ a case about a disputed oil deodorizing process, it appears quite contemporary. Indeed, Merrill's continued vitality as a teaching tool⁴ is but one indication of the patent claim's enduring role as the defining statement of a patent owner's right to exclude others from the marketplace.⁵


1 Act of July 4, 1836, ch. 357, 5 Stat. 117.

2 Act of July 8, 1870, ch. 230, § 26, 16 Stat. 198, 201 (mandating that an applicant "shall particularly point out and distinctly claim the part, improvement, or combination which he claims as his invention or discovery"). For a concise review of the history of claiming practice in the 1800s, see William Redin Woodward, Definiteness and Particularity in Patent Claims, 46 MICH. L. REV. 755, 757-60 (1948). Today's Patent Act contains essentially the same language as the 1870 amendment. See 35 U.S.C. § 112, para. 2 (2000) ("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.").

3 94 U.S. 568, 574 (1877) (resolving whether the word "manufacture," in the claim in dispute, meant "process" or "product").

4 One leading patent law casebook presents Merrill as a principal case. See ROBERT PATRICK MERGES & JOHN FITZGERALD DUFFY, PATENT LAW AND POLICY: CASES AND MATERIALS 872-78 (3d ed. 2002). Another quotes from Merrill in support of the proposition that "[t]he Supreme Court has emphasized for over a century that the claims of a patent should be clear and should control the determination of infringement." DONALD S. CHISUM ET AL., PRINCIPLES OF PATENT LAW 860 (3d ed. 2004). As Professor Duffy observes, "[A] claim drafted at the very beginning of the twentieth century could easily serve as an examination question for law students at the end of the century." John F. Duffy, On Improving the Legal Process of Claim Interpretation: Administrative Alternatives, 2 WASH. U. J.L. & POL'Y 109, 109-10 (2000).

5 See Renishaw PLC v. Marposs Societa' Per Azioni, 158 F.3d 1243, 1248 (Fed. Cir. 1998) ("[T]he claims define the scope of the right to exclude; the claim construction inquiry, therefore, begins and ends in all cases with the actual words of the claim."). This right to exclude is the heart of the patent: "The franchise which the patent grants, consists altogether in the right to exclude every one from making, using, or vending the thing patented, without
There is more to a patent, of course, than its numbered claims. The Patent Act generally requires the patent document to put the claims it contains in their technological context. Specifically, the patent’s written disclosure must support the claims with information that describes the claimed invention, enables people of ordinary skill in the relevant art to make and use the claimed invention, and provides the best mode (assuming there is one) of practicing the claimed invention.\(^6\)

The Patent Act casts these disclosure requirements in open-textured language. One can thus imagine varied sets of more particularized content and format requirements, each of which would fulfill the Patent Act’s demands. The Patent Office, which Congress first empowered to “establish rules and regulations . . . for the conduct of [its own] proceedings”\(^7\) in the very same 1870 statute that codified the claim requirement,\(^8\) has been charged with providing a set of detailed content and format requirements for the patent document. In other words, Congress has “delegated plenary authority over PTO practice” to the Office itself.\(^9\) Today, we find these requirements in Title 37 of the Code of Federal Regulations.\(^10\) The Federal Circuit, for its part, gives a Patent Office rule governing content or format “‘controlling weight unless [it is] arbitrary, capricious, or manifestly contrary to the statute.’”\(^11\)

The Office should strive, in framing its content and format requirements, to produce a patent the claims of which a person having ordinary skill in the art

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\(^8\) See Act of July 8, 1870, § 26, 16 Stat. 198, 201.

\(^9\) Gerritsen v. Shirai, 979 F.2d 1524, 1527 n.3 (Fed. Cir. 1992); see also Stevens v. Tamai, 366 F.3d 1325, 1333 (Fed. Cir. 2004); In re Bogese, 303 F.3d 1362, 1368 (Fed. Cir. 2002) (“The PTO has inherent authority to govern procedure before the PTO, and that authority allows it to set reasonable deadlines and requirements for the prosecution of applications.”).


can understand without the need for routine court intervention.\textsuperscript{12} The patent document itself should, in other words, contain the information that is vital to its proper construction. A novice to the patent system might thus predict that, as technologies progressed and multiplied and the demands placed on the patent system increased (as they surely have),\textsuperscript{13} the Patent Office would have updated its disclosure requirements to better achieve the goal of predictable patent claim boundaries. How, then, have the patent disclosure rules changed to ensure clear and predictable claim boundaries amidst increasing complexity? Sadly, the rules have barely changed at all. As former Patent Office solicitor Nancy Linck recently observed, "[T]he rules governing patent examination are much the same today as they were in 1920."\textsuperscript{14}

When we look at patent exemplars that span the last century, we see that the patent's basic form and content has changed but a little. Consider, for example, the three patents that issued first in the years 1904, 1954, and 2004, all of which are provided in the appendix to this paper. All three patents begin with illustrative drawings and end with claims. The illustrative drawings help one interpret the patent claims by showing the invention as a real-world

\textsuperscript{12} See, e.g., Vitronics Corp. v. Conception, Inc., 90 F.3d 1576, 1583 (Fed. Cir. 1996) ("[C]ompetitors are entitled to review the public record, apply the established rules of claim construction, ascertain the scope of the patentee's claimed invention and, thus, design around the claimed invention."). The Patent Office's regulations embrace this goal. See 37 C.F.R. § 1.75(d)(1) (2004) ("The claim or claims must conform to the invention as set forth in the remainder of the specification and the terms and phrases used in the claims must find clear support or antecedent basis in the description so that the meaning of the terms in the claims may be ascertainable by reference to the description."); see also U.S. PATENT & TRADEMARK OFFICE, DEP'T OF COMMERCE, MANUAL OF PATENT EXAMINING PROCEDURE § 608.01(o) (8th ed. 2001, rev. 2 May 2004) [hereinafter MANUAL OF PATENT EXAMINING PROCEDURE] ("The meaning of every term used in any of the claims should be apparent from the descriptive portion of the specification with clear disclosure as to its import."); id. § 1302.01 ("There should be clear support or antecedent basis in the specification for the terminology used in the claims."). The Manual of Patent Examining Procedure, just cited, is the Patent Office's official "set of instructions to the examining corps." In re Kagan, 387 F.2d 398, 401 (C.C.P.A. 1967). Although "[t]he MPEP does not have the force and effect of law... it is entitled to judicial notice as the agency's official interpretation of statutes or regulations." Refac Int'l, Ltd. v. Lotus Dev. Corp., 81 F.3d 1576, 1584 n.2 (Fed. Cir. 1996).


\textsuperscript{14} Linck et al., supra note 13, at 306 n.4.
object. All three patents state both the date the application for the patent was filed and the date the patent issued. These dates help put the claimed invention in its technological context, marking the invention as an event in the flow of technological change within a given field.

The first example patent, U.S. Patent No. 748,567 to Thomas Adamson, entitled “Distance or Range Finding Instrument,” claims a “distance-finding instrument for marine vessels.” The Adamson patent’s disclosure suggests some of the problems with existing instruments, stating that Adamson’s goals include offering an instrument that “is simple in its construction and organization, besides not liable to get out of order, and possessing the capacity for long and repeated service.” The disclosure then describes the operation of the claimed range-finder in some detail, along the way defining a claim term—“abreast line”—that Adamson appears to have coined for use in this patent.

The second, U.S. Patent No. 2,664,562 to Joseph Cameron, entitled “Positioning Device for Stapling Machines,” claims a “positioning device” with a “base plate” and a “sliding member” that is “reciprocable,” for use with a “stapling machine.” This device is specially adapted “to position fabric wicks around wire wick supports in preparation for stapling the wicks to the supports,” and the stapled wicks are adapted “to diffuse deodorant or perfuming vapors . . . into the air of a room.” Like the Adamson patent, the Cameron patent suggests shortcomings in prior art—this time, prior art stapling operations. It then describes the claimed positioning device in detail. Unlike the Adamson patent, however, the Cameron patent also provides a list of prior art references that the Patent Office had before it when assessing the patentability of Cameron’s claims.

The third, U.S. Patent No. 6,671,884 to Henry Griesbach and Linda Harris, entitled “Method for Defining Areas of a Protective Garment Subjected to Stretching Forces When Worn by Wearer,” claims a “method for making a protective production garment,” such as a surgical gown, “having at least one patch of elastomeric material” in the garment. The list of prior art documents before the Patent Office has moved to the front page of the patent, joined there by category codes for prior art searches and an “Abstract” that summarizes the

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16 U.S. Patent No. 748,567, cols. 5–6 (issued Jan. 5, 1904) (stating five claims).
17 Id. col. 1, Ins. 27–32.
18 Id. cols. 2–4.
19 Id. col. 3, Ins. 22–32 (defining “abreast line”), cols. 5–6 (using the term in all five claims).
21 Id. col. 1, Ins. 2–4.
22 Id. col. 1, Ins. 16–18.
23 Id. col. 1, Ins. 10–15.
24 Id. cols. 2–3.
25 Id. col. 4, Ins. 35–43 (listing six “References Cited in the file of this patent”).
Although longer than the Adamson and Cameron patents, the ‘884 patent’s narrative structure is essentially the same as the earlier patents: after identifying the general field of the invention, and discussing some shortcomings with prior art approaches to the subject, the patent describes the claimed invention in detail.

As even this decidedly unsystematic review of three patents from the last century demonstrates, the content and format rules that shape patents have proved remarkably stable in the face of more complex technologies. To the degree the patent document serves its purposes—to teach new information to artisans in the field and to set clear boundaries on the patentee’s right to exclude others—this stability is desirable. However, where the patent document demonstrably falls short of these goals, the duty to reform the patent document falls squarely on the Patent Office.

If we have learned nothing else from the case law upheavals in the decade after Markman v. Westview Instruments, Inc., where the Federal Circuit held that judges—not juries—construe disputed claim terms, we have learned that patents provide far less aid to their readers than they could. The courts, faced with paltry patent disclosures, turn to expert witnesses and external reference sources for aid. Having licensed resort to these extra-patent sources, the courts struggle to bring the patent disclosure back to pride of place at claim construction’s core. The result is disarray. Professor Moore has found that from 1996 through 2003 the Federal Circuit has reversed 34% of the claim construction decisions brought before it on appeal, and (what’s worse) that the claim construction reversal rate is on an upward trend. The Federal Circuit is increasingly fractured, issuing more and more claim construction decisions over a panel member’s dissent. Perhaps the best proof of the patent

27 *Id.*, first page. For discussion of the advent of the Abstract section, see infra notes 82–88 and accompanying text.

28 *Id.* col. 1, Ins. 8–10, Ins. 58–61.

29 *Id.* col. 1, Ins. 11–57.

30 *Id.* cols. 3–11. Also, like Adamson, the inventors of the ‘884 patent opt to provide express definitions of some key terms used in the disclosure. *Id.* col. 3, ln. 37 to col. 5, ln. 30.

31 52 F.3d 967 (Fed. Cir. 1995) (en banc).

32 *Id.* at 979. A year later, the Supreme Court affirmed the Federal Circuit’s decision in the face of a Seventh Amendment attack. See *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 372 (1996).


document’s shortcomings and the gyrations they produce is that, nearly ten years after its *Markman* decision, the Federal Circuit has granted en banc review in a case to grapple with such basic questions as whether, and how, to use dictionaries in claim construction, and whether to scrutinize underlying claim construction facts by de novo or deferential review. Further judicial tinkering with the machinery of claim construction is unlikely to help, however, if the central problem is the patent document itself.

The Patent Office can and should help improve claim construction by enhancing the patent document’s disclosures as only it can, making all patents more helpful in their own construction. I offer here some analysis that may aid in that enhancement. My plan for this paper, which grows out of a proposal a co-author and I recently made, is straightforward. First, I explore the principles to which claim construction should remain faithful and the means for putting them into practice, one of which is striking a balance between claim text and technological context through the presumption in favor of the ordinary meaning of claim terms to a person having ordinary skill in the art. Second, I establish the Patent Office’s plenary power to shape, and thus to improve, the basic patent document to help bring about more faithful claim construction. This *ex ante* plenary power contrasts with the Federal Circuit’s *ex post* role in resolving disputes, which makes the court largely powerless to change the patent document wholesale. Third, I show that all patents should be required

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average number of alternative opinions (i.e., dissents and concurrences) is now at about 25%. The 20-case moving average number of alternative opinions now varies between 30% and 40%. See CLAIMCONSTRUCTION.COM, CLAIM CONSTRUCTION AT THE FEDERAL CIRCUIT: TRENDS IN ALTERNATIVE OPINIONS, at http://www.claimconstruction.com (last visited Nov. 15, 2004) (graph incorporating all Federal Circuit claim construction opinions from April 1996 to June 2004).

37 See Phillips v. AWH Corp., 376 F.3d 1382 (Fed. Cir. 2004) (order granting en banc review). Chief Judge Mayer’s dissent from en banc review in *Phillips v. AHW Corp.* paints an especially bleak picture:

Nearly a decade of confusion has resulted from the fiction that claim construction is a matter of law, when it is obvious that it depends on underlying factual determinations which, like all factual questions if disputed, are the province of the trial court, reviewable on appeal for clear error. To pretend otherwise inspires cynicism. Therefore, and because I am convinced that shuffling our current precedent merely continues a charade, I dissent from the *en banc* order. *Id.* at 1384 (Mayer, C.J., dissenting).


In its relative impotence to bring about basic change in the patent document’s content and form, the Federal Circuit resembles no one so much as an oft-disappointed purchaser of a monopolist’s shoddy product. The court’s opinions are like unhappy letters to the echoless
to contain four additional bits of information that will help make claim construction more predictable, and at a social cost far outweighed by the social benefit of more certain claim scope. Specifically, the Patent Office should require that every applicant state on the face of any patent (a) the field of art to which the claimed invention pertains; (b) all problems that the claimed invention helps solve; (c) a lexicon of all claim terms to which the applicant gives a meaning other than its accustomed meaning to people having ordinary skill in the pertinent art; and (d) a list of preferred objective reference sources, such as technical treatises and dictionaries (general or specialized), to which an interested reader should refer to learn about the ordinary meaning of the remaining claim terms to a person having ordinary skill in the art. In any subsequent claim construction process, whether for licensing, design-around, or litigation purposes, parties would look to patents enriched with this new information. The patent document, enhanced in this way, would better fulfill its role as claim construction's central resource.

II. FAITHFUL CLAIM CONSTRUCTION

To specify the full range of marketplace conduct that a patent claim empowers the patentee to exclude, we confront a tension that arises necessarily from trying to grasp the world of things—actual inventions in real space—with words.\(^4\) On the one hand, the text of the patent must have some force in limiting the patent's scope. Patentees, who are responsible for the text in their claims, can choose words of greater or lesser generality to define their inventions—for example, "nail" or "fastener"—and their choices should thus make a difference to claim scope. After all, if claim text does not help confine claim scope, claims are not worth the trouble it takes to write them. On the other hand, if a patent's power to exclude reached no further than its claim's literal terms, patent protection would unfairly "place the inventor at the mercy of verbalism"\(^4\) and thus, too weak to attract investments in innovation, would void of "customer service." Perhaps the Patent Office's lack of regulatory response to the past decade of claim construction cases is rooted in its monopoly hold on examining and granting U.S. patents. If so, one route to change might be a competitive market of multiple patent-granting firms. After being certified to examine and to grant U.S. patents, these firms could compete to offer better patents, limited only by the substantive standards of the Patent Act. Such competing Patent Offices might offer varied content and format options to their customers. The government's role could be limited to certifying patent-granting firms, tracking the courthouse success (or other quality metric) of each firm's patents, and providing the quality data to the public. Elaboration of the idea must wait for another day.

\(^4\) See Autogiro Co. of Am. v. United States, 384 F.2d 391, 397 (Ct. Cl. 1967).

An invention exists most importantly as a tangible structure or a series of drawings. A verbal portrayal is usually an afterthought written to satisfy the requirements of patent law. This conversion of machine to words allows for unintended idea gaps which cannot be satisfactorily filled. Often the invention is novel and words do not exist to describe it. The dictionary does not always keep abreast of the inventor. It cannot. Things are not made for the sake of words, but words for things.

fail of its essential purpose. The tension is, in short, between literalism and fairness.

The terrain in which we confront this tension openly is the doctrine of equivalent infringement, according to which one can infringe a claim notwithstanding a departure from the claim's literal scope.\(^4^2\) The Supreme Court, in cases spanning the 1900s, both hews to the insight that "to permit imitation of a patented invention which does not copy every literal detail would be to convert the protection of the patent grant into a hollow and useless thing,"\(^4^3\) and stresses that "the doctrine of equivalents, when applied broadly, conflicts with the definitional and public-notice functions of the statutory claiming requirement."\(^4^4\) In its most recent equivalents case, the Supreme Court described thusly the predictability and fairness goals that the doctrine sits astride:

The [patent] monopoly is a property right; and like any property right, its boundaries should be clear. This clarity is essential to promote progress, because it enables efficient investment in innovation. A patent holder should know what he owns, and the public should know what he does not.

Unfortunately, the nature of language makes it impossible to capture the essence of a thing in a patent application. . . . The language in the patent claims may not capture every nuance of the invention or describe with complete precision the range of its novelty. If patents were always interpreted by their literal terms, their value would be greatly diminished. Unimportant and insubstantial substitutes for certain elements could defeat the patent, and its value to inventors could be destroyed by simple acts of copying. For this reason, the clearest rule of patent interpretation, literalism, may conserve judicial resources but is not necessarily the most efficient rule. The scope of a patent it not limited to its literal terms but instead embraces all equivalents to the claims described.\(^4^5\)

The equivalents cases most clearly engage the inevitable tension in regulating things with words. The tension, however, permeates all claim construction questions.

This tension in claim construction between \(\textit{ex ante}\) conventional literalism and \(\textit{ex post}\) individualized fairness is, of course, endemic to legal interpretation generally.\(^4^6\) To move comfortably in this dynamic tension, which can blur "the

\(^{4^2}\) For a concise review of the doctrine of equivalents, see Schechter & Thomas, \textit{supra} note 6, § 8.2.2.

\(^{4^3}\) \textit{Graver Tank} & \textit{Mfg. Co.}, 339 U.S. at 607.

\(^{4^4}\) \textit{Warner-Jenkinson Co. v. Hilton Davis Chem. Co.}, 520 U.S. 17, 29 (1997); \textit{see also id.} at 33 (insisting on a doctrine of equivalents that gives "proper deference to the role of claims in defining an invention and providing public notice").


\(^{4^6}\) See Philip P. Frickey, \textit{Faithful Interpretation}, 73 \textit{WASH. U. L.Q.} 1085, 1086 (1995). [The law is attempting to accomplish two rather contradictory things. It is attempting, first, to communicate duties to the citizenry in general and to officials in particular, a use of language perhaps substantially captured in the linguist's focus on conventional understandings. Simultaneously, the law seeks to channel the discretion of enforcement.
line separating faithful and faithless enforcement and interpretation," one must identify the principles that should animate a claim construction method to keep it faithful to the patent system's goal of promoting advances in the useful arts by giving inventors property-like rights to exclude.\textsuperscript{48} There are, I think, three such central principles.

First, even as we strive to construe a given claim term correctly, we should resolve doubts in favor of promoting, not retarding, free competition. This benefit of the doubt for free competition means narrower, not broader, patent claims. Such an approach is amply justified by the standard economic account of intellectual property protection as a solution to a market failure in the production of information goods,\textsuperscript{49} according to which "intellectual property is a necessary evil."\textsuperscript{50} In our economy, which relies on interfirm competition to provide consumers with the things they desire at lower quality-adjusted prices, firms are generally free to use public information to compete, even if the information is found through a competitor's offering. "In general, unless an intellectual property right such as a patent or copyright protects an item, it will be subject to copying."\textsuperscript{51} Moreover, the rights to exclude that patents and copyrights confer "are part of a ‘carefully crafted bargain,’ under which, once the patent or copyright monopoly has expired, the public may use the invention or work at will and without attribution."\textsuperscript{52} In this milieu, with its normative tilt...
toward free competition, the patentee bears the burden of claiming an invention in terms the interested public can readily understand. Only a readily understood claim marks off territory sufficiently to put it under the patentee’s sole control, and not all claim construction errors are created equal. Claim construction errors that short patentees with underprotection cause less social harm than claim construction errors that short the public with overprotection. As a result, even as we strive to avoid making any interpretive errors, we should prefer a claim construction error that confers less patentee control over competitors’ conduct than an error that confers more patentee control.

Second, a patentee’s precise choice of claim terms is critically important in determining claim scope. The Patent Act expressly requires that we take this approach, and the cases remind us that claim construction “begins and ends in all cases with the actual words of the claims.” Quite apart from the demands of the Patent Act and case law, however, heavy reliance on a patentee’s choice of words is a matter of common sense. A patentee, cognizant of the free competition norm and the burden it places on her to use terms the interested public can understand, must choose the words in her patent claims with care; otherwise, she risks sacrificing patentable subject matter to the public. Within this pro-competition framework, patentees have virtually unfettered freedom to choose the particular claim words that best capture their inventions. The patentee’s freedom of linguistic choice imposes, of course, a corresponding responsibility on the court system—namely, to enforce the patentee’s word choices for the benefit of the public. The doctrine of equivalents alleviates the unfairness that might result from this focus on a patentee’s word choice, and thus supports the claim text’s central role in determining claim scope.

Third, the text of the patent claim must be tied firmly, throughout the claim construction process, to the claimed invention’s technological context. This is so because individual patents, although they have legal significance, are primarily about technology. Thus, the patent disclosure requirements focus on technological information. One cannot hope to understand the art-specific words in a patentee’s claims correctly unless one keeps that particular technological context in mind. The importance of context to accuracy is most apparent when we consider common terms that have richly varied, field-dependent meanings, e.g., bank, card, channel, chip, cord, file, table, thread, and tile. If we take such words out of context, we can badly misconstrue them. It is not surprising, then, that the courts emphasize the need, in claim construction, to view claim terms from the perspective of a person having

55 See Royal Typewriter Co. v. Remington Rand, Inc., 168 F.2d 691, 692 (2d Cir. 1948) (Hand, J.) (noting that courts “resort to the ‘doctrine of equivalents’ to temper unspiring logic and prevent an infringer from stealing the benefit of the invention”).
56 The Supreme Court has emphasized, in this regard, that “the doctrine of equivalents must be applied to individual elements of the claim, not to the invention as a whole.” Warner-Jenkinson Co. v. Hilton Davis Chem. Co., 520 U.S. 17, 29 (1997).
57 See supra note 6 and accompanying text.
ordinary skill in the art. A person of skill in the art naturally reads claim terms in their proper technological context. Moreover, given the importance of technological context to accuracy, it seems plain that augmenting the patentee’s technological disclosure with carefully selected contextualizing information should help courts more reliably identify disputed claim terms’ technologically proper meanings.

These three principles—err on the side of free competition, focus on text, and stay in context—are the key precepts to which claim construction should adhere. One important practical way to remain faithful to these principles is to maintain an unwavering focus on the whole patent document as the lodestar of the claim construction process. The whole patent document, which the patentee creates, provides the patentee’s chosen text and context for the invention. The Supreme Court’s Markman decision, adopting this method, anchors claim construction firmly to the information that the patent shows on its face. In explaining why it agreed with the Federal Circuit’s allocation of claim construction to judges, the Court emphasized that documentary coherence is just as vital to claim construction as is technological acumen:

In the main, we expect, any credibility determinations [about technology expert witnesses] will be subsumed within the necessarily sophisticated analysis of the whole document, required by the standard construction rule that a term can be defined only in a way that comports with the instrument as a whole. Thus, in these cases a jury’s capabilities to evaluate demeanor, to sense the mainsprings of human conduct, or to reflect community standards, are much less significant than a trained ability to evaluate the testimony in relation to the overall structure of the patent. The decisionmaker [now] vested with the task of construing the patent [i.e., the court] is in the better position to ascertain whether an expert’s proposed definition fully comports with the specification and claims and so will preserve the patent’s internal coherence.

The Court’s mandate, reflected in such phrases as “comports with the instrument as a whole,” “overall structure of the patent,” and “preserve the patent’s internal coherence,” is unmistakable: the courts must construe claims, first and foremost, according to the patent document.

An equally important, practical way to ensure claim construction’s fidelity to free competition, text, and context, is a strong presumption that, absent evidence to the contrary, the patentee has used claim words according to their

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It is the person of ordinary skill in the field of the invention through whose eyes the claims are construed. Such person is deemed to read the words used in the patent documents with an understanding of their meaning in the field, and to have knowledge of any special meaning and usage in the field. The inventor’s words that are used to describe the invention—the inventor’s lexicography—must be understood and interpreted by the court as they would be understood and interpreted by a person in that field of technology.

Id.

ordinary, accustomed meaning to a person having ordinary skill in the art. This is so because a strong default in favor of a word's ordinary meaning to the skilled artisan keeps the focus on text from slipping into an unthinking, acontextual verbalism, while at the same time it keeps the focus on context from drifting into a rootless, atextual ad hocery. In short, an ordinary meaning default strikes the proper dynamic balance between text and context.

An ordinary meaning default also pushes patentees to draft claims with boundaries that a person having ordinary skill in the art can readily grasp, which push helps support the free competition principle. To appreciate how the ordinary meaning default rule plays this role, imagine that one party is trying to communicate with another in writing. The only thing the writer knows about the reader is that he is a competent user of, e.g., standard written American English. How should the writer choose her words and phrases to maximize the likelihood that the reader will construe the writing correctly? The writer concludes that, because a competent reader of standard written American English knows the ordinary meanings of words and phrases in this idiom, she should frame her communication with those same ordinary meanings in mind, i.e., she should use words according to their contextualized ordinary meanings or expressly flag departures from those ordinary meanings. The reader, for his part, is likely to make the corresponding set of assumptions about the writer's strategy for choosing and using words in her written communication.

A strong, ordinary meaning default rule grounds patent drafting in this set of cooperative, interlocking assumptions by writer and reader, and thus rejects an errant patentee’s efforts to prevail against the public by using ordinary-seeming words in secretly self-serving ways. This default rule also provides another example, in legal interpretation, of Grice's maxims of cooperative conversation.

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60 These interlocking assumptions about ordinary meaning and context are basic to all successful communication in a natural language. See generally GEORGIA M. GREEN, PRAGMATICS AND NATURAL LANGUAGE UNDERSTANDING 47–61 (2d ed. 1996) (exploring at length the manner in which natural language interpretation and communication relies upon a series of corresponding assumptions by both speaker and addressee about one another’s beliefs about word choice and word meaning). As Judge Posner has put it, “We understand a message by putting ourselves in the speaker’s shoes.” RICHARD A. POSNER, THE PROBLEMS OF JURISPRUDENCE 101 (1990).

61 Cf. Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1584 (Fed. Cir. 1996) (“Nor may the inventor’s subjective intent as to claim scope, when unexpressed in the patent documents, have any effect. Such testimony cannot guide the court to a proper interpretation when the patent documents themselves do so clearly.”); Markman v. Westview Instruments, Inc., 52 F.3d 967, 985 (Fed. Cir. 1995) (en banc) (“The subjective intent of the inventor when he used a particular term is of little or no probative weight in determining the scope of a claim (except as documented in the prosecution history.”), aff’d, 517 U.S. 370 (1996).

62 Paul Grice, whose 1967 William James Lectures at Harvard University gave rise to the branch of linguistics known as “pragmatics” (i.e., the study of natural language understanding and how context affects meaning), described the basic framework we use when interpreting statements in an exchange in which “[t]he participants have some common immediate aim.” PAUL GRICE, STUDIES IN THE WAY OF WORDS 29 (1989). In the claim construction context, that common end is the successful communication, by the patentee to the world, of the scope of the patentee’s right to exclude.
We cannot eliminate the tension in claim construction between the calls of literalism and fairness. We can, however, mediate the tension, consistent with patent law's social goal of promoting technological progress, by construing claim terms in light of the whole patent document according to a strong default in favor of a word's ordinary meaning to the skilled artisan. This interdependence of the whole patent document and the ordinary meaning default underscores the need to ensure that the patent disclosures we demand are well-suited to produce the information we need to construe the claim text in technological context. It is to the Patent Office's plenary power over the details of these disclosures that I now turn.

III. PATENT OFFICE POWER OVER THE PATENT DOCUMENT

It may seem odd, at first blush, to lift claim construction improvements on the fulcrum of Patent Office procedure. Claim construction, whether in licensing or litigation, occurs after Patent Office procedures have taken their course. All patents, however, result from an examination process. It is therefore certain that any patent that is in license negotiations or litigation today was the subject of patent examination in the past. This basic fact of patent administration indicates that the best way to guarantee that each patent contains the core information that one needs to construe it is to mandate the disclosure of that information on the patent's face. This strategy also comports with the Supreme Court's focus in Markman on preserving documentary coherence.

According to Grice, communicants interpret each other's statements by assuming mutual adherence to a "Cooperative Principle"—namely, "Make your conversational contribution such as is required, at the stage at which it occurs, by the accepted purpose or direction of the talk exchange in which you are engaged." *Id.* at 26. Grice formulates four "maxims," or conventions, that implement the Cooperative Principle, and the fourth of these—styled "Manner"—demands that one "[a]void obscurity of expression," "[a]void ambiguity," "[b]e brief," and "[b]e orderly." *Id.* at 27. Recasting Grice's maxims in slightly different terms, Professor Green states that "agents will not speak obscurely in attempting to communicate." *Green*, *supra* note 60, at 91.

Grice's "Manner" maxim readily explains the strong default in favor of ordinary meaning so commonly used in statutory interpretation cases, as Professors Miller and Sinclair have each demonstrated. See Geoffrey P. Miller, *Pragmatics and the Maxims of Statutory Interpretation*, 1990 WIS. L. REV. 1179, 1220–24; M.B.W. Sinclair, *Law and Language: The Role of Pragmatics in Statutory Interpretation*, 46 U. PITT. L. REV. 373, 391–92 (1985). Ordinary meaning is no less a linchpin for successful communication in claim construction than it is in statutory interpretation.

As Professor Cotropia cogently demonstrates, the most efficient place to accumulate claim construction information from the patentee is in the resulting patent itself. Cotropia, *supra* note 15, at 83. Five years ago, Professor Thomas quite rightly critiqued the way that reliance on prosecution history documents from outside the patent itself, which are voluminous and costly to obtain, distorts the claim construction process. See Thomas, *supra* note 39, at 200–16. He also proposed specific changes that would incorporate needed
The Federal Circuit strives to stay true to the Supreme Court’s insistence that the patent document itself remain claim construction’s lodestar, with mixed results. Time and again the Federal Circuit observes that “evidence intrinsic to the patent—particularly the patent’s specification, including the inventors’ statutorily required written description of the invention—is the primary source for determining claim meaning.” The court has also, however, looked outside the patent document for interpretive aid (usually to a general purpose English language dictionary) with increasing frequency. This increased reliance on dictionaries and the like for claim construction aid appears rooted in a desire to obtain adequate information about the meaning of claim terms to people having ordinary skill in the art (the necessary vantage point) without falling prey to biased advocacy masquerading as expert testimony. The watershed Telegenix case speaks openly in these terms, contrasting objective reference sources (which offer “unbiased reflections of common understanding”) with expert testimony (which is classed with material “colored by the motives of the parties” and “inspired by litigation”). Whatever its root cause(s), the court’s great appetite for more reliable claim construction inputs points out a need for Patent Office action. And the Patent Office has the power to act by making the patent itself a better claim construction resource.

A. Patent Office Power Over Procedure

The Patent Act gives the Patent Office the power to “establish regulations, not inconsistent with law, which . . . shall govern the conduct of proceedings in the Office,” i.e., to make procedural rules that have the force and effect of law for those who seek patent protection by filing an application with the Office. Given the procedural focus of this congressional grant, one might fairly wonder whether the Patent Office’s power extends to requiring applicant disclosures that will determine the substantive scope of the resulting patent. Are such

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65 Astrazeneca AB v. Mutual Pharm. Co., 384 F.3d 1333, 1336 (Fed. Cir. 2004); see, e.g., Jack Guttman, Inc. v. Kopykake Enters., Inc., 302 F.3d 1352, 1360 (Fed. Cir. 2002); Renishaw PLC v. Marposs Societa’ Per Azioni, 158 F.3d 1243, 1250 (Fed. Cir. 1998); Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582 (Fed. Cir. 1996); Autogiro Co. of Am. v. United States, 384 F.2d 391, 397–98 (Cl. Ct. 1967).

66 See Miller & Hilsenteger, supra note 38 (manuscript at 24–29) (documenting increase in Federal Circuit use of objective reference sources from April 1995 to June 2004).


68 See Miller & Hilsenteger, supra note 38 (manuscript at 20). The court’s need for expert information pushes it to seek expert help, and the same lack of expert information leaves the court ill-equipped to separate useful technical information from partisan cant (or worse). The resulting approach-avoidance conflict is endemic to court use of expert testimony. See Ronald J. Allen & Joseph S. Miller, The Common Law Theory of Experts: Deference or Education?, 87 NW. U. L. Rev. 1131, 1131–33 (1993).


disclosure rules procedural in the relevant sense? If so, the Patent Office has the power to promulgate them.

The scope of the Patent Office's procedural power is best measured by the nature of the proceedings it is commanded to conduct—that is, patent examination proceedings. The Patent Act provides that, when it receives an application for patent, the Patent Office "shall cause an examination to be made of the application and the alleged new invention" to assess its patentability under the Act.71 The applicant receives a patent "if on such examination it appears that the applicant is entitled to a patent under the law."72 "It is," in short, "the PTO's duty to assure that the statutory requirements for patentability are met."73 To perform this duty, the Patent Office must construe the scope of each claim under review, for only then can it adjudge whether the claimed invention is useful, new, nonobvious, and properly supported by the remainder of the patent specification.74 Patent examination thus entails claim construction. And the Patent Office, having been charged with patent examination, has the power to structure its proceedings to ensure efficient and accurate claim construction.

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72 Id.

Sadly, the Patent Office also badly distorts its performance of this duty by viewing patent applicants, rather than the general public, as its "customers." See, e.g., U.S. PATENT & TRADEMARK OFFICE, DEPT OF COMMERCE, FISCAL YEAR 2002 CORPORATE PLAN 15 (2001), http://www.uspto.gov/offices/com/corpplan/fy2002/FY2002CorpPlan.pdf [hereinafter FISCAL YEAR 2002 CORPORATE PLAN] ("The mission of the Patent Business is to help customers get patents."). Commentators have noted that this "help customers get patents" approach likely leads to underscrutinized patent applications. See, e.g., Edited & Excerpted Transcript of the Symposium on Ideas Into Action: Implementing Reform of the Patent System, 19 BERKELEY TECH. L.J. 1053, 1112–13 (2004) (remarks of Prof. Mark Lemley). I fear that the "help customers get patents" approach also impedes the Patent Office from ensuring that the disclosures it mandates from applicants keep pace with the information demands that the claim construction case law points up.

74 See 35 U.S.C. §§ 101, 102, 103, 112 paras. 1–2 (2000) (referring throughout to "the invention"); Rockwell Int'l Corp. v. United States, 147 F.3d 1358, 1362 (Fed. Cir. 1999) ("The first step in any invalidity or infringement analysis is claim construction."); In re Van Geuns, 988 F.2d 1181, 1184 (Fed. Cir. 1993) ("It is axiomatic that the claims define the invention which an applicant believes is patentable."); In re Wilson, 424 F.2d 1382, 1385 (C.C.P.A. 1970) ("All words in a claim must be considered in judging the patentability of the claim against the prior art."); see also MANUAL OF PATENT EXAMINING PROCEDURE, supra note 12, at §§ 2111, 2173.05 (providing examiners with claim construction principles). See generally SCHECHTER & THOMAS, supra note 6, chs. 3–6, for background on the utility, novelty, nonobviousness, and written disclosure requirements.
Many of the Patent Office regulations governing patent applications appear designed to facilitate an examiner's efficient comprehension of the scope of the applicant's proposed claims. For example, to implement the Patent Act's open-textured mandate of a specification that describes the invention and ends with numbered claims, the Patent Office details both the materials the specification must contain and the order in which those materials must be arranged. Similarly, to implement the Patent Act's broadly framed provision allowing for illustrative drawings, the Patent Office maintains highly detailed regulations governing the form and content of patent drawings. All these regulations, each of which more or less directly affects the substantive scope of the resulting patent rights, are framed with the primary goal of structuring the examination process to facilitate accurate and efficient patentability assessments. These rules are thus procedural, i.e., they are designed not to shape the primary behavior of inventors (e.g., inventors' decisions to invent new solutions to problems or, instead, use known solutions), but rather to improve the accuracy and efficiency of inventors' engagement with the government officials who assess their legal rights.

Most interestingly, for purposes of this discussion, the Patent Office has already promulgated a procedural rule that directly targets helping an examiner readily understand the words in the claims. Specifically, the Patent Office expressly requires that a patent application "[b]e in the English language or be accompanied by a translation of the application... into the English language together with a statement that the translation is accurate." This rule, by making the very words in which the applicant frames the claim more readily accessible to the patent examiner, clearly helps the Office more accurately and efficiently determine the scope of the claim to which the applicant asserts an entitlement. And the rule, by dictating the very language in which they are

75 This analysis is adapted from Miller & Hilsenteger, supra note 38 (manuscript at 49).
77 37 C.F.R. §§ 1.71–1.75 (prescribing content), 1.77(b) (prescribing arrangement) (2004).
80 I owe the formulation to LAWRENCE B. SOLUM, PROCEDURAL JUSTICE 19–21, 20 n.49 (Public Law & Legal Theory Research Paper Series, Research Paper No. 04–02, 2004), http://ssrn.com/abstract=508282. See also Hanna v. Plumer, 380 U.S. 460, 475 (1965) (Harlan, J., concurring) (One can distinguish substantive and procedural rules "by inquiring if the choice of rule would substantially affect... primary decisions respecting human conduct."); S.A. Healy Co. v. Milwaukee Metropolitan Sewerage District, 60 F.3d 305, 310 (7th Cir. 1995) (Posner, J.) (A state rule has a substantive goal if it is "designed to shape conduct outside the courtroom and not just improve the accuracy or lower the cost of the judicial process."); Thomas W. Merrill, The Common Law Powers of Federal Courts, 52 U. CHI. L. REV. 1, 46 n.200 (1985) ("Substantive rules... guide the conduct of persons outside the courtroom, before they are drawn into litigation. By negative implication, 'procedural' rules are those that would not affect behavior in... 'everyday, prelitigation life.'").
written, just as clearly determines the substantive scope of the resulting patent claims.

How, then, are these Patent Office rules generally rooted in the Federal Circuit’s claim construction jurisprudence? On at least one recent occasion, the Patent Office has adjusted its patent application content rules to take account of the Federal Circuit’s post-Markman cases. Specifically, in June 2003, the Patent Office modified the longstanding rule requiring an “Abstract” in every application, first promulgated in 1966, to conform the rule to the Federal Circuit’s claim construction case law. From 1966 to 2003, the rule requiring an abstract had ended with the statement that “[t]he abstract shall not be used for interpreting the scope of the claims.” In Hill-Rom Co. v. Kinetic Concepts, Inc., however, the Federal Circuit concluded that, notwithstanding the text of the Office’s abstract rule, there was “no legal principle that would require [it] to disregard [a] potentially helpful source of intrinsic evidence as to the meaning of claims.” The Patent Office expressly relied on Hill-Rom to explain its deletion of the final sentence in its 2003 revision to the rule. This admittedly minor rule change, informed by Federal Circuit case law, sets a useful precedent for further improvements to the patent document.

B. Deploying Procedural Power for Substantive Benefit

The mere fact of a power’s existence does not, of course, justify any particular exercise of it. Nor does the Federal Circuit’s apparent desire for improved claim construction inputs by itself warrant any particular Patent Office response. Patent Office action to augment the patent disclosure in the specific ways suggested here is justified, however, by two companion considerations. First, issued patents are themselves a form of commercial regulation, albeit in property rights form, and, as a result, the public is entitled to see them made as clear and predictable in scope as is practicable. Second, the particular additions to the patent document I propose will, for a small cost increase imposed on patent applicants, yield large cost savings for the general public, as well as some offsetting savings for applicants.

82 37 C.F.R. § 1.72(b) (2004).
85 See, e.g., 37 C.F.R. § 1.72(b) (1967); 37 C.F.R. § 1.72(b) (1983); 37 C.F.R. § 1.72(b) (2003).
86 209 F.3d 1337 (Fed. Cir. 2000).
87 Id. at 1341 n.*.
That issued patents are commercial regulations that govern the general public’s conduct is not open to serious question. An issued patent claim, conferred by a government agency after a process that excludes public participation, empowers its owner credibly to assert that others may not compete with it in the market space covered by the patent claim. And the Federal Circuit has recently reaffirmed that one who knows about a patent has a duty of care to avoid infringing it, although an adverse inference that any infringement was likely willful no longer flows from the mere failure to obtain a lawyer’s opinion about the scope of the patent. The fact that patents are commercial regulations—indeed, nationwide regulations with several extraterritorial effects—counsels that patent claims, the operative regulatory language, should have a clear and predictable scope. The Patent Office is primarily responsible for obtaining (or failing to obtain) this result.

Both due process norms and the economic analysis of property law support the view that claim scope should be predictable. On the due process side, a law

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89 See John R. Thomas, The Responsibility of the Rulemaker: Comparative Approaches to Patent Administration Reform, 17 BERKELEY TECH. L.J. 727, 741–44 (2002); Mark A. Lemley, Property, Intellectual Property, and Free Riding 56 (John M. Olin Program in Law and Economics, Working Paper No. 295, 2004), http://ssrn.com/abstract=582602. Professor Ghosh shows that, notwithstanding patent’s plainly regulatory nature, we often prefer to talk of it in social contract terms by invoking the grand quid pro quo metaphor that appears in the case law. See Shubha Ghosh, Patents and the Regulatory State: Rethinking the Patent Bargain Metaphor after Eldred 3–11 (Aug. 9, 2004), http://ssrn.com/abstract=574141. This “patent as social contract” approach can be especially distracting where, as here, we are trying to ascertain how readily the general public should be able to interpret a legal instrument (namely, the patent) that it had no hand in formulating.

90 See 35 U.S.C. § 122(c) (2000) (barring pre-grant “protest” or “opposition” proceedings). I confess to wry amusement that, on the one hand, the process for obtaining a patent—with its exclusion of the public and resulting self-authored, government-backed power to chase others from the market—produces about 180,000 utility patents a year but attracts little more than the proverbial yawn, while, on the other hand, allegations that Vice President Cheney’s energy task force secretly let energy business players effectively write self-dealing legislation spawns federal litigation and howls of protest. See Linda Greenhouse, Justices’ Ruling Postpones Resolution of Cheney Case, N.Y. TIMES, June 25, 2004, at A19; Don Van Natta, Jr., Enron’s Many Strands: The Overview, N.Y. TIMES, Jan. 31, 2002, at A1.

91 A particular patentee’s assertion may, of course, be wrong, either because the patentee mistakes the scope of its claims or because the asserted claims ought never to have been granted in the first place. In this sense, patent rights are probabilistic, conferring more of a right to sue than a right to exclude. See Herbert Hovenkamp et al., Anticompetitive Settlement of Intellectual Property Disputes, 87 MINN. L. REV. 1719, 1761 (2003); Joseph Scott Miller, This Bitter Has Some Sweet: Potential Antitrust Enforcement Benefits from Patent Law’s Procedural Rules, 70 ANTITRUST L.J. 875, 881–82 (2003); Mark A. Lemley & Carl Shapiro, Probabilistic Patents 2 (John M. Olin Program in Law and Economics, Working Paper No. 288, August 2004) (prepared for J. ECON. PERSPECTIVES), http://ssrn.com/abstract=567883.


is constitutionally infirm if it is so vague that the public is left to guess at the boundary between blameless and culpable conduct; fundamental fairness requires that public legal obligations pass a basic clarity threshold. The Supreme Court sounded just this theme in *Merrill v. Yeomans*, observing that “nothing can be more just and fair, both to the patentee and to the public, than that the former should understand, and correctly describe, just what he has invented, and for what he claims a patent.” On the economic analysis side, it is well-accepted that clearer property boundaries promote efficiency by lowering the transaction costs associated with bargaining over rights. Whether one views the matter through the lens of due process or efficiency, patent claims should have boundaries that are as clear and predictable as is practicable.

The only general question that remains is whether there are steps that the Patent Office can take to improve the form and content of the patent document and that offer a social benefit large enough to cover the added cost to patent applicants. Given that many patents will never be enforced by their owners or consulted by the public, it would of course be foolish to mandate new disclosure rules so exacting that the increased cost of patent preparation swamps any predictability benefit that the changes would produce. This cost-benefit analysis is an important one that any reform proposal must confront, as Professor Lemley demonstrated in his much-discussed 2001 essay on the balancing of benefits and costs in improving patent quality. The additional disclosures I propose will produce benefits far in excess of their costs. The estimates upon which I base my conclusion are admittedly limited by the lack of solid data on the frequency and cost of patent licensing negotiations, as well as the near-impossibility of monetizing the inefficiencies, static and dynamic, generated by uncertain claim scope. Even with these limitations, however, I think the estimates make a compelling case for the wisdom of enhancing patent disclosures in the way I propose.

The primary cost of compelling the additional disclosures in the patent document that I enumerated earlier, apart from the cost of promulgating the

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94 See generally 3 RONALD D. ROTUNDA & JOHN E. NOWAK, TREATISE ON CONSTITUTIONAL LAW—SUBSTANCE AND PROCEDURE § 17.8, at 104-07 (3d ed. 1999); LAURENCE H. TRIBE, AMERICAN CONSTITUTIONAL LAW § 12-31 (2d ed. 1988). The importance to patent law of this vagueness constraint on public regulation has grown as the scope of patentable subject matter has expanded to embrace expressive activities that raise First Amendment concerns. See John R. Thomas, Liberty and Property in Patent Law, 39 Hous. L. Rev. 569, 580–92 (2002) (documenting the expansion of patentable subject matter into areas of expressive activity).

95 94 U.S. 568, 573–74 (1877).

96 See, e.g., ROBERT COOTER & THOMAS ULEN, LAW AND ECONOMICS 87–94 (3d ed. 2000). As Professor Moore has argued, “[U]ncertainty in the boundaries of the patent holder’s property right... will divert resources from innovative efforts (research and development) to enforcement (transaction or litigation costs), decreasing the value of the property right and thereby decreasing its efficacy as a means for promoting innovation.” Kimberly A. Moore, Forum Shopping in Patent Cases: Does Geographic Choice Affect Innovation? 79 N.C. L. Rev. 889, 928 (2001) (footnote omitted).

disclosure regulation itself, is the increased cost of preparing a patent application for its initial filing. How big is this cost likely to be? Of the four types of information I propose adding, two—the field of art and problems solved—can be disclosed at virtually no extra cost, because a patent lawyer has already assessed these matters en route to forming an adequately grounded pre-filing legal judgment about the patentability of the inventor's claims. Of the remaining two types, one—a list of preferred objective reference sources—can also be formulated and disclosed at very low cost. The final type, a list of explicit definitions for all claim terms to which the inventor attaches an other-than-ordinary meaning, is the one most likely to impose noticeable increased drafting costs. Using the added time it would take to formulate these new disclosures as the primary cost-driver, let us assume for the sake of discussion that the disclosures I propose would result in a 5% increase in patent preparation costs. What does that mean in dollar terms?

According to the American Intellectual Property Law Association's ("AIPLA") most recent biennial survey of, among other things, patent prosecution and litigation costs, the national median costs of preparing and filing "relatively complex" applications in the three main technological areas are as follows: (a) biotechnology/chemical, $10,001; (b) electrical/computer, $9,995; and (c) mechanical, $8,001. The average median cost across these technologies is $9,332.33. A 5% increase translates to $466.62 per application. The Patent Office receives just over 330,000 utility patent applications a year, about 28% of which are continuation applications, i.e., applications

98 Like Professor Thomas, I do not put much stock in the notion that a modest increase in patent application costs will drive many people away from the patent system in favor of trade secret protection, or diminish the general level of innovation: "our experience suggests that the demand for patent examination services is relatively inelastic." Thomas, supra note 89, at 743.

Once again, I draw heavily here on Miller & Hilsenteger, supra note 38 (manuscript at 54).

99 See infra Part IV.

100 See Miller & Hilsenteger, supra note 38 (manuscript at 55).

101 I think this estimate is on the high side, and thus leads to an overstated cost. If, however, the benefits of the proposal appear to outweigh even this overstated cost, the proposed change is all the more likely to yield a net social benefit.


104 The principal empirical study of these applications reports that, during fiscal years 1993–1998, "28.4% of the utility, plant, and reissue (UPR) applications filed in those years were not new or original applications, but were continuing applications claiming the benefit of the filing dates of previously filed applications." Cecil D. Quillen, Jr. & Ogden H. Webster, Continuing Patent Applications and Performance of the U.S. Patent and Trademark Office, 11 FED. CIR. B.J. 1, 3 (2001); see also id. at 16 tbl.1. The Quillen & Webster data group utility patent applications with plant and reissue applications. Only the utility applications, however, are of interest in this study. Their 28% figure remains a good estimate for continuing applications for utility patents alone because reissue and plant patent applications make up such a small portion of the total number of applications filed in a given year. For example, in fiscal year 2003, the Patent Office received 331,729 utility
that simply re-initiate the examination process on an application that had already been filed at least once before.\textsuperscript{105} Of course, an application will entail the added disclosure costs only the first time it is filed. Using the 5% increase assumption, the estimated annual increase in total preparation costs $110,868,912.\textsuperscript{106}

Would augmenting the patent disclosure in the ways I propose allow us to capture a social savings of at least $110.8 million per year? I think it would. The first source of savings will go directly back to the applicant’s bottom line—namely, reduced costs in the remainder of patent prosecution. The patent examiner’s improved ability to assess the scope of the claims that the applicant has proposed should translate into more focused (i.e., cheaper) exchanges between the applicant and Patent Office. The size of this savings is hard to estimate, but it doubtless exists.

Another source of savings would be court cases that are not filed at all because greater agreement on the likely construction of an arguable claim term makes litigation unnecessary. And, because litigation is quite expensive, even a small number of avoided infringement suits generates considerable savings. According to the AIPLA’s most recent biennial survey, the national median cost of a full patent trial in which $1 to $25 million is at risk is $2 million per side, i.e., $4 million.\textsuperscript{107} If 28 such trials are avoided every year, the new rule has both paid for itself and yielded a small social benefit; additional avoided trials are pure benefit. Given that about 1,900 utility patent infringement cases are filed every year,\textsuperscript{108} and that about 95 of these cases are fully tried,\textsuperscript{109} avoiding 28 trials seems unlikely. Avoiding, for example, five such trials seems reasonably likely and would generate a savings of $20 million, i.e., 18% of the increased cost of greater disclosure.

In addition to helping avoid full trials, an improved patent document should help litigation parties settle their cases earlier than they otherwise would and thereby save costs. The national median cost of taking through discovery a patent infringement case in which $1 to $25 million is at risk is $1,001,000 per side, i.e., about $2 million.\textsuperscript{110} If discovery costs are cut in half in 111 median-cost cases per year (or cut by a quarter in 222 median-cost cases, etc.), the new

\textsuperscript{105} For a concise explanation of continuation applications in U.S. patent practice, see Quillen & Webster, supra note 104, at 4–6.

\textsuperscript{106} (330,000 applications per year) x (72% originally filed) x ($466.62 per application) = $110,868,912.00 per year.

\textsuperscript{107} See REPORT OF THE ECONOMIC SURVEY 2003, supra note 102, at 93 tbl.22.

\textsuperscript{108} See Moore, supra note 96, at 902 (indicating that, from 1995 to 1999, U.S. district courts resolved about 1,900 cases per year).

\textsuperscript{109} See Kimberly A. Moore, Judges, Juries, and Patent Cases—An Empirical Peek Inside the Black Box, 99 MICH. L. REV. 365, 384 tbl.1 (2000) (reporting that from 1983 to 1999, the annual number of full patent trials ranged from a low of 73 to a high of 112, with an average of 95).

\textsuperscript{110} See REPORT OF THE ECONOMIC SURVEY 2003, supra note 102, at 93 tbl.22.
disclosures have paid for themselves. With an annual patent infringement case filing rate of 1,900, it appears feasible to save discovery expenses in an amount sufficient to cover the increased patent preparation costs of these new disclosures.

Another source of savings would be less costly license negotiations. The savings mechanism, as with avoided litigation, is greater agreement among the parties on the likely construction of an arguable claim term. There are virtually no reliable data about how many of the roughly 180,000 patents that issue each year are licensed for revenue. Professor Lemley, in his study of the costs and benefits of various patent law reform proposals, estimates that about 3.5% of issued patents are licensed for revenue without litigation, and that the cost to an industry of negotiating a license with the patentee is $100,000. Using these assumptions, along with my admittedly subjective estimate that the enhanced disclosures I propose will lower that licensing cost by 2%, the annual savings is $12,600,000. This licensing savings alone covers 11% of the increased patent preparation cost of my proposal. Using a licensing cost discount of 10%, which I think is a more likely figure, the enhanced disclosures generate an annual licensing cost savings of $63,000,000, i.e., 57% of the estimated increase in annual patent preparation costs.

Finally, a key source of savings would be avoided dead weight loss arising from more effective competition against patentees from those who have designed around their patents. An improved patent document will reduce the uncertainty of a competitor’s analysis of the scope of the claim; the reduced uncertainty will, in turn, facilitate more rapidly achieved and more numerous design-arounds. Competition from these design-arounds will help drive down the patentee’s price to marginal cost sooner than would otherwise occur, thereby helping trim dead weight loss. I cannot begin to estimate the size of this effect, but it is hard to believe that it would fall below $110.8 million per year in an economy, like ours, with an annual GDP of about $11 trillion.

Importantly, the savings from enhanced certainty take nothing from patentees that they are entitled to keep. One of the core policies underlying the public notice function that clear claim language serves is the desirability of facilitating design-arounds by the patentee’s competitors. As the Federal Circuit once put it, “Designing around patents is, in fact, one of the ways in which the patent system works to the advantage of the public in promoting


\[112\] See Lemley, supra note 97, at 1507.

\[113\] Id. at 1507–08.

\[114\] (180,000 patents per year) x (3.5% licensed) x ($100,000 per license) x (2% savings per license) = $12,600,000 savings per year.

\[115\] (180,000 patents per year) x (3.5% licensed) x ($100,000 per license) x (10% savings per license) = $63,000,000 savings per year.

progress in the useful arts, its constitutional purpose.” To improve the helpful information shown on the face of the patent, and thereby make it a better input for its own construction, helps us capture savings that belong to the public.

The most important assumptions of the foregoing analysis are that the additional disclosures proposed here will cause only a small increase in patent preparation costs, and greatly enhance the patent document’s value as a claim construction input. Indeed, unless they enhance the clarity and predictability of patent claim boundaries, the disclosures I suggest have no purpose. All that remains is to consider the degree to which the new disclosures I propose will make claim construction more predictable.

IV. SITUATING THE INVENTION WITHIN THE RELEVANT ART

Nearly every patent fits within a context of numerous prior art solutions to the problem that the new invention solves. The printed publications that reflect the state of this prior art at the time the invention was made also show how artisans in the field address each other in their favored idiom. It is no surprise, then, that the courts have recognized prior art documents, such as issued patents and technical publications, as a helpful claim construction resource. In Markman, the Federal Circuit explained that “the state of the prior art at the time of the invention... is useful ‘to show what was then old, to distinguish what was new, and to aid the court in the construction of the patent.’” Prior art that the patentee has cited within the patent itself is especially helpful in claim construction. It is also true, however, that one can properly construe a claim by consulting prior art beyond that which the patentee cited or the Patent Office considered.

In view of the established value of prior art to claim construction, it is passing strange that the Patent Office does not, at the very least, require an applicant to state on the face of the patent the field of art to which the claimed invention pertains. Such a statement would help anyone who wants to construe the patent’s claims to more readily identify documents that show actual usage in the field.

What does the Patent Office require? The relevant rules require the applicant to state, in addition to the claims, a “[d]etailed description and specification of the invention,” a “brief abstract of the technical disclosure in

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119 See, e.g., Kumar v. Ovonic Battery Co., 351 F.3d 1364, 1367-68 (Fed. Cir. 2003).
120 See Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1584 (Fed. Cir. 1996) (“[A] court in its discretion may admit and rely on prior art proffered by one of the parties, whether or not cited in the specification or the file history. This prior art can often help to demonstrate how a disputed term is used by those skilled in the art.”).
the specification,” and a “brief summary of the invention indicating its nature and substance.” In addition, in stating the order in which the parts of an application should be arranged, the rules call for a “[b]ackground of the invention” but do not indicate what the “background” should convey.

Why, then, do some patents begin with a patentee’s statement of the field of art to which the invention pertains? For example, the most recent of the three patents I discussed earlier—the ‘884 patent—states on its face that it “relates generally to the field of protective garments, and more particularly to an improved surgical gown configuration.” The answer lies in the rules that govern examiners, not applicants, set forth in the Manual of Patent Examining Procedure (“MPEP”).

Specifically, the MPEP indicates that the “Background of the Invention” section of an application should contain both a “Field of the Invention” statement—”[a] statement of the field of art to which the invention pertains”— and a “[d]escription of the related art.” Examiners are told that this arrangement for the disclosure is “preferable.” Patentees, however, are free to disregard this guidance from the MPEP, because it “does not have the force and effect of law.” As a result, while some instructional books for new patent lawyers indicate that a patent application should state the invention’s field of art, others quite openly recognize that a statement of the field of art is not required and may recommend that it be avoided. For example, a Practising Law Institute treatise on patent drafting, in a section called “What the Background Section Should Not Include,” quotes the MPEP information noted above and gives the following advice:

There is no benefit to be obtained [for the applicant] from specifying the “Field of the Invention.” Identification of the “field of the invention” can hurt the applicant. If the field of invention is described very broadly, this can be interpreted to be an admission that anything within the broad description is analogous art and can be used to reject the claims under 35 U.S.C. § 103. If the field of the invention is described unduly narrowly,

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122 37 C.F.R. § 1.72(b) (2004). The purpose of the abstract is “to enable [one] to determine quickly from a cursory inspection the nature and gist of the technical disclosure.” Id.


124 37 C.F.R. § 1.77(b)(5) (2004). As the patents discussed earlier indicate, patentees often use this section to describe the shortcomings of the prior art. See supra notes 15–30 and accompanying text.

125 U.S. Patent No. 6,671,884, col. 1, Ins. 8–10 (issued Jan. 6, 2004).

126 MANUAL OF PATENT EXAMINING PROCEDURE, supra note 12, § 608.01 (c).

127 Id. § 608.01(a). A pro se applicant seeking information from, e.g., the Patent Office website would find the same advice in A GUIDE TO FILING A NON-PROVISIONAL (UTILITY) PATENT APPLICATION, http://www.uspto.gov/web/offices/pac/utility/utility.htm#background (last modified Jan. 18, 2005).


then the scope of the claims may be interpreted during litigation to be of commensurate narrow scope.\textsuperscript{130}\textsuperscript{1}

According to this treatise, then, precisely because a statement of the field of invention can help the public construe the claim language, the patentee should not provide one. The treatise gives similar advice about the wisdom of describing the related art.\textsuperscript{131}

It is common ground, or should be, that, to properly counsel a client on the patentability of an invention and to competently draft a patent application, the lawyer must know the range of prior art that is pertinent to the claims (even if she does not know every prior art item that falls in that range). This range of art is vital to claim drafting, as well as to the novelty and nonobviousness analyses. It is also clear, in generic terms, how far the range of pertinent prior art extends: The courts have long held that the pertinent prior art includes items that are either (a) from the same field of endeavor as the claimed invention, or (b) reasonably pertinent to the specific problems with which the inventor is involved.\textsuperscript{132} The Patent Office should therefore require every applicant to state, on the face of the patent, this same basic information—namely, the field of art for the claimed invention, and the problem(s) that the claimed invention helps solve. The cost to applicants of the added disclosure would be minimal, because the lawyers who advise them will already have a considered view on these points. With the benefit of these explicit pointers to the pertinent prior art, anyone construing a claim term from the patent can focus on documents that show actual usage in the pertinent art with confidence that the documents are highly relevant to claim construction.

One may fairly wonder whether the Federal Circuit, in the wake of a Patent Office rule change of the type I propose, would treat these additional patent disclosures as having the great weight I ascribe to them. After all, one might argue, the example used earlier to show that the Patent Office takes regulatory steps to hew to the Federal Circuit’s claim construction case law—namely, the Patent Office’s modifying its abstract rule in the wake of the Hill-Rom case\textsuperscript{133}—proves that the Federal Circuit does not feel bound in the least by Patent Office claim construction rules. It is true that, in Hill-Rom, the Federal Circuit rejected the contention that it was bound by the then-current abstract rule’s limiting language,\textsuperscript{134} according to which “[t]he abstract shall not be used for interpreting the scope of the claims.”\textsuperscript{135} But the reason the Federal Circuit gave for disregarding the abstract rule is far more important to the fate of the new rules I propose than the specific result in that case. According to Hill-Rom,

\begin{enumerate}
  \item \textsuperscript{130} JEFFREY G. SHELDON, HOW TO WRITE A PATENT APPLICATION § 7.5.7.2, at 7-58 (supp. 2001).
  \item \textsuperscript{131} Id.
  \item \textsuperscript{132} See In re Bigio, 381 F.3d 1320, 1325 (Fed. Cir. 2004); In re Clay, 966 F.2d 656, 658–59 (Fed. Cir. 1992); In re Deminski, 796 F.2d 436, 442 (Fed. Cir. 1986); In re Wood, 599 F.2d 1032, 1036 (C.C.P.A. 1979).
  \item \textsuperscript{133} See supra notes 82–88 and accompanying text.
  \item \textsuperscript{134} See Hill-Rom Co. v. Kinetic Concepts, Inc., 209 F.3d 1337, 1341 n.* (Fed. Cir. 2000).
  \item \textsuperscript{135} 37 C.F.R. § 1.72(b) (1983).
\end{enumerate
ENHANCING PATENT DISCLOSURE

the paramount policy of using every interpretive clue that the patent disclosure provides trumped the abstract rule's purported limits: speaking of the abstract, the court stated it was "aware of no legal principle that would require us to disregard that potentially helpful source of intrinsic evidence as to the meaning of claims."136 The court's approach in Hill-Rom is hardly surprising, given the many cases in which it has held that a patentee is bound in subsequent litigation by her statements in the intrinsic patent record.137 The new disclosure rules I propose here take advantage of the Federal Circuit's decided preference for binding a patentee to the statements she makes on the face of her patent by mandating and recording additional informative statements from the patentee. The Federal Circuit will embrace, not reject, these disclosure rules and make full use of the new information they generate.

Patent applicants, at the time they file their applications, know (or should know) the two additional pieces of information identified here that help put a claimed invention in its technological context, i.e., a patentee's express statements of a field of art and the problems solved. Given the ease with which the patentee can provide this information at very small added patent preparation cost, and the way the information directly promotes more accurate claim construction, the Patent Office should require patentees to disclose this information to the public in all cases.

V. FORCING A LEXICON AND REFERENCE SOURCE INFORMATION

It is axiomatic that, absent sufficient indications to the contrary in the specification or the prosecution history, the courts give claim terms their ordinary and accustomed meanings to people skilled in the art.138 This approach, which originates in regional circuit law more than 60 years old,139 is

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136 Hill-Rom Co., 209 F.3d at 1341 n.*.
137 See, e.g., Springs Window Fashions LP v. Novo Indus., L.P., 323 F.3d 989, 995 (Fed. Cir. 2003) ("The public notice function of a patent and its prosecution history requires that a patentee be held to what he declares during the prosecution of his patent."); Vectra Fitness, Inc. v. TNWK Corp., 162 F.3d 1379, 1384 (Fed. Cir. 1998) ("The public is entitled to rely upon the public record of a patent in determining the scope of the patent's claims."); Key Pharm. v. Hercon Labs. Corp., 161 F.3d 709, 716–17 (Fed. Cir. 1998) ("Competitors are entitled to rely on the public record of the patent, and if the meaning of the patent is plain, the public record is conclusive."); Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1583 (Fed. Cir. 1996) ("Competitors are entitled to review the public record, apply the established rules of claim construction, ascertain the scope of the patentee's claimed invention and, thus, design around the claimed invention."); see also Riverwood Int'l Corp. v. R.A. Jones & Co., 324 F.3d 1346, 1354 (Fed. Cir. 2003) ("This court and its predecessor have held that a statement by an applicant during prosecution identifying certain matter not the work of the inventor as 'prior art' is an admission that the matter is prior art.").

138 See, e.g., ResQNet.com, Inc. v. Lansa, Inc., 346 F.3d 1374, 1378 (Fed. Cir. 2003) ("A fundamental principle for discerning the usage of claim language is the ordinary and accustomed meaning of the words amongst artisans of ordinary skill in the relevant art at the time of invention.").

139 See Universal Oil Prods. Co. v. Globe Oil & Ref. Co., 137 F.2d 3, 6 (7th Cir. 1943) ("[W]ords will be given their ordinary and accustomed meaning unless it appears that the inventor used them differently.").

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settled law at the Federal Circuit. Indeed, the Federal Circuit has recently underscored its commitment to the ordinary meaning default, referring to a “heavy presumption in favor of the ordinary meaning of claim language” in more than 20 cases over the last three years.

It is also axiomatic that a patentee is free to be her own lexicographer, i.e., to provide her own definitions for claim terms in the balance of the specification. The caveat is that any special definition given to a word must be clearly defined in the specification. And this caveat has been, so far as I am concerned, the greatest single source of unpredictability in the Federal Circuit’s post-Markman case law.

The reason that any special definition must be provided with sufficient clarity is plain enough: only a clear and deliberate special definition gives people of ordinary skill in the art, to whom the patent is directed, adequate notice of the change from ordinary meaning. Operationalizing the requisite clarity for special definitions, however, has proved anything but plain. On the one hand, a leading claim drafting guide recommends that any special definition for a claim term be provided in the form, “As used in this description and in the appended claims, the word ‘__’ means ‘__’.” On the other hand, we know from everyday life that a writer can alter a word’s meaning simply by consistent, targeted usage throughout a document.

In a small number of post-Markman cases, the Federal Circuit flirted with the notion of requiring expressly definitional syntax to specially define a claim term—most clearly in Johnson Worldwide Associates v. Zebco Corp. The

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141 See Miller & Hilsenteger, supra note 38 (manuscript at 10).

142 Id.

143 Id. at 990. The first of these occurs where “the patentee has chosen to be his or her own lexicographer by clearly setting forth an explicit definition for a claim term.” Id. (emphasis added); see also Teleflex, Inc. v. Ficosa N. Am. Corp., 299 F.3d 1313, 1327 (Fed. Cir. 2002) (“[A] patentee demonstrate[s] an intent to deviate from the ordinary and accustomed meaning of a claim term by redefining the term or by characterizing the invention in the intrinsic record using words or expressions of manifest exclusion or
court has since held, however, that a patentee can specially define a claim term not only expressly by a definitional statement, but also tacitly by, e.g., describing a particular structure as a part of "the invention" or as a key to "all embodiments." As the court explained in the SciMed case, "the written description can provide guidance as to the meaning of the claims, thereby dictating the manner in which the claims are to be construed, even if the guidance is not provided in explicit definitional format." The court's ad hoc approach to determining whether the patent specially defines a claim term comports with our everyday experience that we can often infer a more specialized word meaning from usage of that word in a particular document. This approach also preserves the likely expectations of patentees who obtained patents free of the strictures of a more exacting approach. The price of the court's flexibility, however, is far more uncertainty in litigation, and thus in business planning. It is hard to predict whether the courts will accept or reject the contention that a given patentee's usage in the specification rises to the level of a special definition for a claim term. The Federal Circuit has acknowledged the quandary, for itself and the public, thus:

Interpretation of descriptive statements in a patent's written description is a difficult task, as an inherent tension exists as to whether a statement is a clear lexicographic definition or a description of a preferred embodiment. The problem is to interpret claims "in view of the specification" without unnecessarily importing limitations from the specification into the claims.

This "inherent tension" cannot be solved within the current framework's indulgence for tacit special definitions.
The Federal Circuit’s jurisprudence of autolexicography is a jurisprudence of doubt. Predictability finds no refuge in it. The Patent Office, with its plenary power over the patent document, can bring far greater predictability to claim construction by implementing two additional disclosure rules that will cut through the fog of tacit special definitions.

First, the Patent Office should amend the rules governing patent content and format to require that every patent contain a lexicon section. In this new lexicon section, an applicant would be required either (a) to provide an exclusive, exhaustive list of express definitions for any claim term to which the applicant gives a meaning other than its ordinary meaning to people having ordinary skill in the art, or (b) to state that none of the claims terms has a meaning other than its ordinary meaning to people having ordinary skill in the art. This new lexicon would work seamlessly with the existing claim construction approach that examiners employ, i.e., giving claim terms the broadest reasonable meaning consistent with the specification (including any special definitions therein). It would also focus applicants on the need to make clear, from the outset, when they are using claim terms in an unconventional way. Later, whether in licensing or litigation, both the patentee and the public would know that it is not open to anyone to argue that a claim term missing from the lexicon has a special definition based on arguable vagaries of usage within the patent being construed. The argument would not be available because the patentee’s own statements in the patent, which are binding, would foreclose it.

Second, to help both patent examiners and the public obtain more reliable, predictable sources that show the ordinary meaning of claim terms at the time the application was filed, the Patent Office should amend its rules to require that every patent list, on its face, the patentee’s preferred objective reference sources (i.e., dictionaries, encyclopedias, and technical treatises). Anyone who wants to learn more about a claim term’s ordinary meaning can then consult the prior art and the objective reference sources the patentee has listed, confident that, in litigation, the courts would consult the same sources. This confidence would arise, again, from the binding nature of the patentee’s statements in the patent. A co-author and I have discussed the costs and benefits of this specific proposal in detail elsewhere. For present purposes, it suffices to emphasize that this additional disclosure is likely to impose only minimally increased patent preparation costs. Patent drafters who regularly consult reference sources in preparing patents, as the handbooks urge, have merely to identify the materials already at hand. Patent drafters who are not in the habit of consulting reference sources will quickly settle on the most suitable sources for the arts in which they practice.

151 See, e.g., In re Thrift, 298 F.3d 1357, 1364 (Fed. Cir. 2002); In re Hyatt, 211 F.3d 1367, 1372–73 (Fed. Cir. 2000); In re Morris, 127 F.3d 1048, 1055–56 (Fed. Cir. 1997).
152 See supra note 137.
153 See supra note 137.
154 See Miller & Hilsenteger, supra note 38 (manuscript at 10).
155 See, e.g., FABER, supra note 145, § 19, at III-16; SHELDON, supra note 130, § 6.3.5.1.3, at 6-32.
These two additional disclosures will doubtless cost applicants more to provide than the two art-related disclosures described above. These disclosures also promise, however, profound enhancements to the predictability of claim construction. By requiring every patentee to put on the face of every patent both a lexicon that eliminates the search for implicit special definitions and a list of objective reference sources on which the public (including the courts) can rely for evidence of ordinary meaning, the Patent Office will make every patent a far more informative claim construction resource.

VI. CONCLUSION

The basic patent document contains the types of information that it does not by accident, or through Providence, but because the Patent Office, using a power delegated by Congress, requires that it do so. Judges, who come to claim construction disputes long after Patent Office rules have forced the patent's disclosure into a given shape, are relatively powerless to make the patent document a more informative claim construction input. The Patent Office, by contrast, has plenary authority to mandate a form of patent disclosure that both informs the relevant art and clearly defines the patentee’s right to exclude others, all at a reasonable cost to patent applicants and patent readers alike. Within the broad outlines drawn by the Patent Act, the Patent Office is thus responsible for any basic shortcoming in the form of the patent disclosure that hinders the claim construction process.

Ten years of claim construction case law, when consulted by one who seeks to learn lessons about how the instrument itself can be improved, have taught us much about the present patent document’s shortcomings. The Patent Office, heeding these lessons, should make every patent a better aid to predictable construction by requiring patentees to provide further information that casts much needed light on the claim construction inquiry. Well counseled patentees already possess this information—fields of art, problems solved, lexa for specially defined terms, and objective reference sources for remaining terms. Compelling applicants to disclose all the helpful information they possess as a matter of routine, and placing it on the face of the patent document, will yield predictability benefits that far outweigh the small increase in patent preparation costs.

Until the Patent Office lights this candle, there is little else for restive observers to do but curse the darkness of chaotic post-Markman case law.
T. ADAMSON.
DISTANCE OR RANGE FINDING INSTRUMENT.
APPLICATION FILED APR. 6, 1903.

NO MODEL.

Fig. 2.

Fig. 3.

WITNESSES:

Edward Thorpe
E.E. Ellis

INVENTOR
Thomas Adamson

BY
Attorneys.
To all whom it may concern:

Be it known that I, THOMAS ADAMSON, of the United States Navy, a citizen of the United States, and a resident of the city of New York, 5 borough of Brooklyn, in the county of Kings and State of New York, have invented a new and improved Distance or Range Finding Instrument, of which the following is a full, clear, and exact description.

This invention relates to distance or range finding instruments; and it consists, substantially, in the construction, organization, and combination of parts hereinafter particularly described, and pointed out in the claims.

Though applicable to other purposes in the arts, my improvements are intended more especially for use upon marine vessels and the like; and the principal object of this invention is to provide an instrument of this kind whereby the captain or other navigator of the vessel is enabled to ascertain at any time the distance of the vessel from a given distant point ahead—as a lighthouse, for instance—and also to likewise ascertain the distance the vessel will be from such point when abreast of the same.

A further object of the invention is to provide an effective and reliable instrument of the character referred to which is simple in its construction and organization, besides not liable to get out of order, and possessing the capacity for long and repeated service.

The above and additional objects are attained by means substantially such as are illustrated in the accompanying drawings, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a plan view of one embodiment of my improved device or instrument, said view illustrating a certain bearing or observation as having been taken by the navigator. Fig. 2 is a similar view of a slightly different embodiment of the instrument, said view also indicating as having been taken a like observation or bearing to that shown in Fig. 1; and Fig. 3 is a transverse sectional view in detail representing the construction and organization of cooperative elements or parts of the instrument.

Before proceeding with a more detailed description it may be stated that my improvements are based upon the well-known principles of plane trigonometry, and in the embodiments thereof herein illustrated 1 preferably employ a board or chart, which in shape or configuration is practically a right-angled parallelogram made up of approximately two squares lying one in advance of the other in a horizontal plane, the said board or chart being mounted in position at any convenient and proper place on the vessel, as will be fully apparent from the description hereinafter following. In order that similar observations and calculations may be made from either side of the vessel with equal effect, I preferably construct the device or instrument in duplicate, and it will be understood, of course, that while I have herein represented a certain preferred embodiment of my improvements I do not intend to limit myself to the details thereof in practice, since immaterial changes therein may be made coming within the scope of my invention. The upper surface of the board or chart is of special embodiment, whereby the results desired may be had from the instrument, and in some instances I preferably employ specially constructed and organized movable elements or parts cooperatively applied to said board or chart, whereby the navigator is enabled to make somewhat more frequent observations and calculations than may be possible with the board or chart alone.

Specific reference being had to the drawings, and more especially to Fig. 1 thereof, the numeral 1 preferably construct the device or instrument in duplicate, and it will be understood, of course, that while I have herein represented a certain preferred embodiment of my improvements I do not intend to limit myself to the details thereof in practice, since immaterial changes therein may be made coming within the scope of my invention. The upper surface of the board or chart is of special embodiment, whereby the results desired may be had from the instrument, and in some instances I preferably employ specially constructed and organized movable elements or parts cooperatively applied to said board or chart, whereby the navigator is enabled to make somewhat more frequent observations and calculations than may be possible with the board or chart alone.

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with the most distant outer angle thereof is a diagonal pointer or indicator line 11, which practically divides the parallelogram into duplicate right-angled triangles, of each of which the said indicator line 11 may be said to constitute the hypotenuse. This line and the line 8 and 21 of the chart is also a line which I denominate the "abreast" line, since the principal calculations or observations are made with reference to what the distance of the vessel will be from a lighthouse or other determinate object. 22) It may be explained, for instance, a to 33 inclusive, and likewise I also place alongside each line a suitable character denoting different degrees of the course of the vessel—as indicated from a to h, inclusive, for instance, and thus, as hereinafter mentioned, am I enabled also at any time to ascertain the bearing of the vessel.

It will be noted that the surface of the board or chart of the instrument, near to the rearward edge 3 of the chart, is also a line 21, which I denominate the "abreast" line, since the principal calculations or observations are made with reference to what the distance of the vessel will be at the outside of or alongside the surface, as shown at a to h, inclusive, and those of each set or series being spaced apart for substantially equal distances, also as shown.

As shown in Fig. 2, I also employ a board or chart 23, substantially identical in all respects with the one already described; but I also employ in connection with the set or series of lines of each parallelogram a set or series of rods 26, preferably shown as three in number (although the number may be varied) 27 and which also radiate from practically a common center, at which they are pivoted, as shown, the rods of each set or series being adapted to be moved or swung into alignment or registry with the lines 11, 14, and 17, if desired, by which the same observation already described may be taken with the rods the same as with the lines; but the said rods are made use of more especially for observations at such times as the distant object 28 may be located intermediate of any two of such lines, as will be apparent. Thus the rods of each series are shown as in intermediate positions for such purpose, and it will be understood that the desired results may be easily obtained numerically by simple mental calculation. In order to move the rods of each series to any position desired, any suitable means may be employed, shown herein preferably in the form of a block or slide 30, each having on the inner face thereof a longitudinal substantially rounded offset or projection 31, fitting and working within a substantially semicylindrical guide 32 therefor, set within the material of the board or chart along the corresponding edge 3 thereof. Each slide is provided with a set-screw 33 or other means for securing the same at different positions of adjustment, and the upper surface of each slide is provided with a series of rotatable eyes or similar devices 34, through which the free ends of the rods work in the various movements imparted thereto in adjusting the slide for effecting different observations in the manner and for the purpose hereinbefore fully explained. The upper surface of each block is provided intermediate the rods with regularly-spaced pins or projections 35, by which observations may also be made similarly as by the rods themselves.

It will be noted that the surface of the board or chart at the inner side of the hypotenuse or line 11 of each of the right-angled triangles is plain or without lines or other characters, thus enabling calculations or observations to be readily made without confusion, as is apparent.

Having thus described my invention, I...
claim as new and desire to secure by Letters Patent—

1. A distance-finding instrument for marine vessels, comprising practically a parallelogrammic chart having thereon a diagonal line and an abreast line, said lines and an edge of the chart forming a right-angled triangle, the chart also having thereon other diagonal lines extending inwardly from said edge intermediate said first-mentioned diagonal line and the abreast line, each of the diagonal lines referred to having alongside the abreast line, and said designation of the bearing of the vessel, on that line, and also having a similar designation of the angular relation of said line to a distant object and the abreast line, the surface of said chart, at the inner side of the first-mentioned diagonal line, being plain or devoid of lines.

2. A distance-finding instrument for marine vessels, comprising practically a parallelogrammic chart having thereon a diagonal line and an abreast line, said lines and an edge of the chart forming a right-angled triangle, the chart also having thereon other diagonal lines extending inwardly from said edge intermediate said first-mentioned diagonal line and the abreast line, each of the diagonal lines referred to having alongside thereof a numerical designation of the bearing of the vessel, on that line, and also having a similar designation of the angular relation of said line to a distant object and the abreast line, the surface of said chart, at the inner side of the first-mentioned diagonal line, being plain or devoid of lines.

3. A distance-finding instrument for marine vessels, comprising practically a parallelogrammic chart having thereon a diagonal line and an abreast line, said lines and an edge of the chart forming a right-angled triangle, the chart also having thereon other diagonal lines extending inwardly from said edge intermediate said first-mentioned diagonal line and the abreast line, each of the lines referred to having alongside thereof a numerical designation of the bearing of the vessel, on that line, and also having a similar designation of the angular relation of said line to a distant object and the abreast line, and said chart being further provided with a series of pivoted rods radiating substantially from the point of intersection of the abreast line with the said first-mentioned diagonal line, combined with means for simultaneously moving said rods, and means for securing them in different positions.

4. A distance-finding instrument for marine vessels, comprising practically a parallelogrammic chart having two of the most distant angles thereof intersected by a diagonal line, and provided with an abreast line, and also having other diagonal lines intermediate the first and said abreast line, each of said diagonal lines having alongside thereof a numerical designation of the bearing of the vessel, on that line, and also having a similar designation of the angular relation of said line to a distant object and the abreast line, and said chart being further provided with a series of pivoted rods radiating substantially from the same center as said diagonal lines, and adapted to be moved to different positions on the surface of the chart, and to a slidable adjustable block with which the rods have movable connection.

5. A distance-finding instrument for marine vessels, comprising practically a parallelogrammic chart having two of the most distant angles thereof intersected by a diagonal line, and provided with an abreast line, and also having other diagonal lines intermediate the first and said abreast line, each of said diagonal lines having alongside thereof a numerical designation of the bearing of the vessel, on that line, and also having a similar designation of the angular relation of said line to a distant object and the abreast line, and said chart being further provided with a series of pivoted rods radiating substantially from the same center as said diagonal lines, and adapted to be moved to different positions on the surface of the chart, and to a slidable adjustable block with which the free ends of the rods have movable connections, said block having on the upper surface thereof a series of projections which are intermediate the rods.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THOMAS ADAMSON.

Witnesses:

E. EVERETT ELLIS,
J. E. JONES.
This invention relates to a positioning device for a stapling machine adapted to position fabric wicks around wire wick supports in preparation for stapling the wicks to the supports. The stapling machine itself does not constitute part of my invention; it may be of any conventional type, power- or hand-operated, and preferably includes provision for automatically feeding staples to the dies as is well known in the art.

My device is designed to provide a simple and economical means for positioning wicks and wick holders in such a machine in preparation for the stapling operation, and to permit ready removal of the stapled wick-and-wick-support assemblies. It is particularly adapted to handle wicks and supports such as are employed to diffuse deodorant or perfuming vapors from a liquid contained in a bottle into the air of a room.

Such wicks are usually strips of woven or felt fabric doubled over and stapled to a wire support. The latter is of a suitable shape, size and material to retain the wick by friction in the neck of the bottle at any desired height. A typical wick may, for example, be a felt strip 12-14 inches long, 3/8-1 inch wide and 1/4-3/4 inch thick, but these dimensions are not limiting.

My device consists essentially of a long narrow base plate with means to position the forward end firmly about the lower die or anvil of the stapler, a sliding member mounted in guides on the base plate and having a hook or other means at the forward end to engage wick support, a tension spring or other device at the rear end for retracting the sliding member, a detent on the sliding member and a trigger on the base plate for holding the sliding member in extended position, and guide means mounted on the base plate for guiding a wick and associated support into stapling position.

One embodiment of my invention is described in detail in the following disclosure and in the drawings, but these are intended to be illustrative only and not to limit the invention, the scope of which is defined in the appended claims.

In the drawings:
Fig. 1 represents my positioning device mounted on a conventional foot-operated stapling machine;

Fig. 2 is a plan view of my device with the sliding member in extended position and a wick and wick support in place;

Fig. 3 is an end view of my device as seen viewing Fig. 2 from the right, but without the wick and wick support;

Fig. 4 is a side elevation of my device as seen viewing Fig. 2 from the trigger side;

Fig. 5 is a plan view of the forward end of my device with the sliding member retracted, showing a wick and wick support in position after stapling; and

Fig. 6 is a perspective view of a wick-and-wick-support assembly before placing in my positioning device.

Base plate 1 is provided with an annular boss 2 at its forward end having set screws 3 by which it is firmly mounted on the lower die or anvil 4 of the stapling machine. The base plate is also provided with guides 5 in which slides the sliding member 6. An eyebolt 7 is mounted on the rear end of the base plate.

Sliding member 6 is provided with a hook 8 at its forward end, a wedge-shaped detent 9 near its center and an eyebolt 10 just behind the detent. A tension spring 11 connects eye-bolt 7 and eyebolt 10, and tends to retract slide 6 to the left, as shown in the drawings.

Mounted on base plate 1 is a trigger 12 pivoted between posts 13. A compression spring 14 urges the outer end of the trigger upwards to bring its inner end into engagement with detent 9 when sliding member 6 is drawn to the right as seen in the drawing, and thus to retain the sliding member in this position against the pull of spring 11.

Also mounted on plate 1 is a guide assembly 15 for guiding a partially assembled wick and wick support when my device is in use. This guide assembly consists of two short channel bars 16 mounted on the base, a cross bar 17 bridging them at their forward ends and two adjusting screws 18 with associated lock nuts. The channel bars 16 are preferably mounted at a slight converging angle with channels facing each other as shown.

My device is shown in Fig. 1 mounted on a conventional stapler operated by a pedal 19. Depression of the pedal operates the stapling head 20 by means of pitman 21. The stapling head 20 is pivoted at 22. It includes a device for feeding staples to upper die 23.

In operating my device a wick 24 is loosely threaded through the upper loop 25 of a wire wick support 26 with one end of the wick extending some 2-4 inches further than the other, as shown in Fig. 6. Sliding member 6 is drawn forward until detent 9 is engaged by trigger 12, and loop 25 is passed over hook 8 as shown in Fig. 2. The outer end of trigger 12 is depressed, releasing sliding member 6 which is retracted by spring 11. This draws the wick and its wire support through guide assembly 15, thus folding the wick tightly over the support by action of the bar 17,
forcing together the tips 27 of the bowedlegs of the support and positioning the wick and support tips under the upper stapler die 23. Depression of stapler head 20 by means of pedal 19 then inserts a staple 28 through both layers of wick and clinches it around tips 27 of support 26 as shown in Fig. 5. Wick and sliding member are then drawn forward until trigger 12 again engages detent 9 and the stapled wick-end-wick support assembly is removed from hook 8. The device is then ready for a repetition of the operation.

From the above description it will be clear to those skilled in the art that various modifications may be introduced into my device departing from the scope of my invention as defined in the claims.

I claim:

1. A positioning device for use with a stapling machine having a die and an anvil, said device comprising a base plate, a sliding member, guide means therefor, the base plate having at one end means for securing it firmly in operating position with respect to the anvil of the stapling machine, the sliding member being reciprocable in guide means on the base plate relatively to the anvil from a loading position to a stapling position and having at its forward end means for removable attaching a wick to be stapled by means of a wick support, and additional guide means adjacent the anvil surrounding the path of travel of the wick, and mounted on the base plate, the additional guide means being so positioned with relation to the anvil that, on reciprocation of the sliding member, with attached wick and wick support from the loading position to the stapling position, the wick will thereby be drawn through said additional guide means and positioned with respect to the anvil for stapling.

2. A positioning device as defined in claim 1 comprising resilient biasing means acting on the sliding member to urge it towards the stapling position, the sliding member being manually reciprocable towards the loading position, and comprising retaining means for retaining the sliding member against the anvil in loading position, said retaining means comprising a trigger and a detent.

3. A positioning device as defined in claim 1 comprising resilient biasing means acting on the sliding member to urge it towards the stapling position, the sliding member being manually reciprocable towards the loading position, and comprising retaining means for retaining the sliding member against the anvil in loading position, said retaining means comprising a trigger and a detent.

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METHOD FOR DEFINING AREAS OF A PROTECTIVE GARMENT SUBJECT TO STRETCHING FORCES WHEN WORN BY WEARER

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Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

APPL. NO.: 10/286,378
FILED: Nov. 1, 2002

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ABSTRACT

A method is provided for defining areas of a protective garment, such as a surgical gown, that are subjected to tensile stretching forces when worn by a wearer. Once identified, such areas may be substituted with elastomeric patches so that restrictive forces experienced by bearers of the garment are relieved.

14 Claims, 7 Drawing Sheets
FIG. 1
Prior Art
FIG. 5
FIG. 6B
METHOD FOR DEFINING AREAS OF A PROTECTIVE GARMENT SUBJECTED TO STRETCHING FORCES WHEN WORN BY WEARNER

TECHNICAL FIELD OF THE INVENTION

The present invention relates generally to the field of protective garments, and more particularly to an improved surgical gown configuration.

BACKGROUND

Protective garments such as surgical gowns are well known. The usefulness of these garments is generally influenced by a number of factors, such as breathability, resistance to fluid flow, barrier protection qualities, etc. Comfort of the garment is also an important factor. For example, a surgical gown must be comfortable to a person wearing the garment for extended hours.

Factors affecting the comfort of the garment include the stretch properties, softness, and breathability of the garment material. Materials that are soft, stretchable, and breathable are typically more comfortable than materials that do not have those characteristics.

Conventional disposable surgical gowns are commonly constructed from a nonwoven fabric. The gown body section is generally a singular piece of material, or is composed of a number of panels of material attached together, for example, a front panel and attached side panels that also define a back section of the gown. Sleeves are attached to the gown body by any number of known techniques. An example of a surgical gown made using raglan-type sleeves attached to a piece of gown body is the Lightweight Gown (product code 90751) from Kimberly-Clark, Corp. of Neenah, Wis., USA. When a gown of this type is donned and the wearer's arms are extended outward in front of the torso and crossed, the fabric in the back shoulder area is tensioned and felt as a restrictive force against the wearer's shoulders. This restrictive force is most often identified by wearers in the area where the gown body fabric joins the back and underside of the sleeves.

It is a common practice to attempt to reduce (relieve) restrictive forces in the fabric in the area placed under tension, such as via pleats, or inserted secondary patches. Another approach suggested in the art is to construct the gown body out of an elastomeric or recoverable-stretch material so that when the fabric is subjected to the restrictive forces (the forces encountered by a non-elastomeric fabric), the fabric elongates. Various elastomeric nonwoven materials and fabrics are available for such purpose, including laminates of a nonwoven web and elastomeric film.

A drawback of making the entire gown body, or entire panel portions, of an elastomeric material is that such materials are significantly more costly, and thus add to the overall cost of the product and healthcare in general.

The present invention relates to a unique method for precisely determining the areas of a protective garment that are subjected to tensile stretching forces so that such areas may be substituted with an elastomeric material.

SUMMARY

Object and advantages of the invention will be set forth in the following description, or may be obvious from the description, or may be learned through practice of the invention.

The present invention relates to a method useful in making a unique configuration of a protective garment, particularly a surgical gown, wherein patches of extensible material are selectively provided in the gown in the areas of maximum stress (i.e., the areas subjected to a maximum stretching force when worn by a wearer). The extensible patch areas are completely surrounded by the remaining material of the gown (generally a non-extensible material) and, thus, may be thought of "islands" of extensible material strategically located in the gown. In one particular embodiment, the predefined areas of stress that are placed under a tensile stretching force when the garment is worn are located in the back shoulder portions of the gown body. It is in this area that the extensible material patches are disposed.

In the embodiment wherein the back portion of the gown is open and defined by back panel sections, an extensible material panel is provided in each of the back shoulder portions of each panel.

The method according to the invention allows for relative precise definition of the areas of a garment that are subjected to tensile stretching force when worn by a wearer under normal conditions. Once identified, these areas may be substituted with elastomeric material. In a process as described herein, the stressed areas may be empirically determined and mapped out on the gown body for subsequent replacement with extensible material patches.

The extensible material patches are not limited to any particular shape. In one particular embodiment, the patches are crescent shaped and generally allow the contour of the sleeve openings in the gown body. In another embodiment, the extensible material patches are generally elongated members having a longitudinal dimension greater than a lateral dimension. The precise shape of the patches can be empirically determined as described herein.

It should be appreciated that a garment, in particular a surgical gown, constructed in accordance with the invention is not limited to any particular type of materials. Conventional materials for forming the body and sleeves of a gown are well known to those skilled in the art, and any such material may be used for a gown in accordance with the present invention. Likewise, there are a number of elastomeric extensible materials used in the art that may serve adequately as the extensible material patches for use in the present invention. Examples of such materials will be described in greater detail below.

The garment according to the invention may have a conventional body configuration. For example, the garment may have a closed front portion that is made from a first panel of material and an open back portion defined by back panels that are attached to the first panel of material along side the seams of the garment. In an alternate embodiment, the garment may have front and back portions formed from a single piece of material. The style and configuration of the garments is not a limiting factor. Regardless of the type of garment, once the areas of maximum stress or tensile force are mapped and identified, extensible material patches may be incorporated into the gown at these areas.

The invention will be described in greater detail below by reference to embodiments illustrated in the figures.

BRIEF DESCRIPTION OF THE DRAWINGS

A full and enabling disclosure of the present invention, including the best mode thereof, directed to one of ordinary skill in the art, is set forth more particularly in the remainder of the specification, which makes reference to the appended figures in which:

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FIG. 1 is a perspective view of a prior art surgical gown. FIG. 2A is a perspective view of a garment in accordance with the present invention. FIG. 2B is an enlarged planar view of the elastomeric panel used in the garment of FIG. 2A. FIG. 3A is a perspective view of a garment in accordance with the present invention. FIG. 3B is an enlarged planar view of the elastomeric panel used in the garment of FIG. 3A. FIG. 4A is a perspective view of a garment in accordance with the present invention. FIGS. 4B and 4C are an enlarged planar view of the elastomeric patches used in the garment of FIG. 4A. FIG. 5 is a perspective view of a prototype working gown used in the method of the invention, the gown having a grid pattern defined on the body thereof. FIG. 6A is a perspective view of the prototype gown being worn by an individual and subjected to a range of motion so that the areas subjected to tensile stretching forces may be identified. FIG. 6B is an enlarged view of the back shoulder area of the gown indicated in FIG. 6A.

DETAILED DESCRIPTION

Reference will now be made in detail to one or more embodiments of the invention, examples of which are graphically illustrated in the drawings. Each example and embodiment are provided by way of explanation of the invention, and not as a limitation of the invention. For example, features illustrated or described as part of one embodiment may be utilized with another embodiment to yield still a further embodiment. It is intended that the present invention include these and other modifications and variations.

"Attached" refers to the bonding, joining, adhering, connecting, attaching, or the like, of two elements. Two elements may be considered attached together when they are bonded directly to one another or indirectly to one another, such as when each is directly attached to an intermediate element.

"Elastomeric" refers to a material or composite which can be extended or elongated by at least 25% of its relaxed length and which will recover, upon release of the applied force, at least 10% of its elongation. It is generally preferred that the elastomeric material or composite be capable of being elongated by at least 100%, recover at least 50% of its elongation. An elastomeric material is thus stretchable and "stretchable", "elastomeric", and "extendable" may be used interchangeably.

"Elastic" or "Elasticated" means that property of a material or composite by virtue of which it tends to recover towards its original size and shape after removal of a force causing a deformation.

"Neck-bonded" laminate refers to a composite material having an elastic member that is bonded to a non-elastic member while the non-elastic member is extended in the machine direction creating a necked material that is elastic in the traverse or cross-direction. Examples of neck-bonded laminates are disclosed in U.S. Pat. Nos. 4,965,122; 4,981,747; 5,226,692; and 5,336,545, which are incorporated herein by reference in their entirety for all purposes.

"Stretch-bonded" laminate refers to a composite material having at least two layers in which one layer is a gatherable layer and the other layer is an elastic layer. The layers are joined together when the elastic layer is in an extended condition so that upon relaxing the layers, the gatherable layer is gathered. For example, one elastic member can be bonded to another member while the elastic member is extended at least about 25% of its relaxed length. Such a multi-layer composite elastic material may be stretched until the non-elastic layer is fully extended. Examples of stretch-bonded laminates are disclosed, for example, in U.S. Pat. Nos. 4,720,415; 4,789,699; 4,871,966; 4,657,802; and 4,655,760, which are incorporated herein by reference in their entirety for all purposes.

As used herein, the term "nonwoven web" refers to a web that has a structure of individual fibers or filaments which are interlaced, but not in an identifiable repeating manner. Nonwoven webs have been in the past, formed by a variety of processes known to those skilled in the art such as, for example, meltblowing and melt spinning processes, sputter-bonding processes and bonded carded web processes.

As used herein, the term "sputter-bonded web" refers to web of small diameter fibers and/or filament web, for example, by extruding a molten thermoplastic material as filaments from a plurality of fine, usually circular, capillaries in a spinneret with the diameter of the extruded filaments then being rapidly reduced, for example, by non-educitive or educitive fluid-drawing or other well known sputter-bonding mechanisms. The production of sputter-bonded nonwoven webs is illustrated in patents such as Appel, et al., U.S. Pat. No. 4,340,563; Dorschner, et al., U.S. Pat. No. 4,619,261; Kinney, U.S. Pat. Nos. 3,338,992 and 3,341,394; Levy, U.S. Pat. No. 3,276,944; Peterson, U.S. Pat. No. 3,502,538; Harman, U.S. Pat. No. 3,502,753; Dobol et al., U.S. Pat. No. 3,542,615; and Harmon, Canadian Patent No. 803,714.

As used herein, the term "meltblown web" refers to a nonwoven web formed by extruding a molten thermoplastic material through a plurality of fine, usually circular, die capillaries as molten fibers into converging high velocity gas (e.g., air) streams that attenuate the fibers of molten thermoplastic material to reduce their diameter, which may be to micrometer diameter. Thereafter, the meltblown fibers are carried by the high velocity gas stream and are deposited on a collecting surface to form a web of randomly disposed meltblown fibers. Such a process is disclosed, for example, in U.S. Pat. No. 3,849,241 to Butin, et al., which is incorporated herein in its entirety by reference thereto for all purposes. Generally speaking, meltblown fibers may be microfibers that may be continuous or discontinuous, are generally smaller than 10 microns in diameter, and are generally rooky when deposited onto a collecting surface.

As used herein, the term "deposable" is not limited to single use or limited use articles but also refers to articles that are no inexpensive to the consumer that they can be discarded if they become soiled or otherwise unsuitable after only one or a few uses.

As used herein, the term "garment" refers to protective garments and/or shields including, for example, but not limited to, surgical gowns, patient drapes, work suits, aprons and the like.

As used herein, the term "liquid resistant" or "liquid repellent" refers to material having a hydrostatic head of at least about 25 centimeters as determined in accordance with the standard hydrostatic test ASTM CTM No. 127-1977 with the following exceptions: (1) The samples are larger than usual and are mounted in a stretching frame that clamps onto the cross-machine direction ends of the sample, such that the samples may be tested under a variety of stretch
conditions (e.g., 10%, 20%, 30%, 40% stretch); and (2) The samples are supported underneath by a wire mesh to prevent the sample from sagging under the weight of the column of water.

As used herein, the term "breathable" means previous to water vapor and gases. For instance, "breathable barriers" and "breathable films" allow water vapor to pass through, but are liquid resistant. The "breathability" of a material is measured in terms of water vapor transmission rate (WVTR), with higher values representing a more breathable material and lower values representing a less breathable material. Breathable materials generally have a WVTR of greater than about 250 grams per square meter per 24 hours (g/m²·24 hours). In some embodiments, the WVTR may be greater than about 3000 g/m²·24 hours. In some embodiments, the WVTR may be greater than about 5000 g/m²·24 hours.

As used herein, the term "reversibly-necked material" refers to a necked material that has been treated while necked to impart memory to the material so that when force is applied to extend the material to its pre-necked dimensions, the necked and treated portions will generally recover to their necked dimensions upon termination of the force. A reversibly-necked material may include more than one layer. For example, multiple layers of spunbonded web, multiple layers of meltblown web, multiple layers of bonded carded web or any other suitable combination of mixtures thereof. The production of reversibly-necked materials is illustrated in patents such as, for example, Mormon, U.S. Pat. Nos. 4,065,122 and 4,081,747.

The present invention relates to a unique configuration for a protective garment. The garment is illustrated and described herein as a surgical gown for illustrative purposes. It should be appreciated that a garment in accordance with the invention is not limited to a gown, and may include, for example, a patient gown or drape, work coverall, robe, etc. A conventional gown 100 is conceptually illustrated in FIG. 1. The gown includes a gown body 12 having a front portion 14 and a back portion 16. The gown body may be formed from a single piece of material, or may be defined by separate panels of material joined at seams. Sleeves 22 are generally attached to the gown body at sleeve openings 24 defined in the body 12. The sleeves 22 may be of the same or a different material as the body 12. Various configurations of gowns 100 are well known to those skilled in the art and all such configurations are within the scope and spirit of the invention.

The gown material is generally a breathable yet liquid resistant barrier material. The breathability of the material increases the comfort of someone wearing such a garment, especially if the garment is worn under high heat index conditions, vigorous physical activity, or long periods of time. Various suitable woven and non-woven barrier materials are known and used in the art for garments such as surgical gowns, and all such materials are within the scope of the present invention. A suitable gown material is, for example, a Spunbonded non-woven material as described in U.S. Pat. No. 5,464,688 incorporated herein by reference for all purposes, with appropriate chemical treatments to enhance repellency and static decay.

Still referring to FIG. 1, it has been determined that the areas of greatest restrictive forces generated when the gown 100 is donned and the wearer's arms are extended outwardly are the back shoulder areas adjacent to the sleeves. The restrictive forces felt by the wearer are generated by tensile stretching forces exerted on the material. The restrictive force areas are designated generally by the dashed-line areas 32 in FIG. 1. The present applicants have found that the restrictive forces can be greatly alleviated by first identifying the precise areas wherein the tensile stretching force is generated, and then replacing the non-elasticomer gown material in those areas with isolated zones or patches of elastomer material. By precisely mapping the stressed areas, the amount of elastomer material used in the gown is minimized and a more comfortable gown can be made with little additional cost. Embodiments of garments, e.g., gowns, according to the invention are described in greater detail below with reference to FIGS. 3-4.

FIG. 2A illustrates a gown 10 in accordance with the invention. The gown 10 is similar in many aspects to the conventional gown illustrated in FIG. 1. The gown 10 includes a gown body 12 having a front portion 14 and a back portion 16. The back portion 16 may be an open back defined by adjacent back portions 18 having opposite longitudinal edges 20. The back portions 18 include back shoulder regions, back waist regions, lower regions, etc. Any type of known fastening means, such as conventional ties, may be included on the gown 10 on a wearer. The gown body 12 may be formed from a single piece of material, such as a breathable yet liquid impervious barrier material, defining a neck opening 22 and sleeve openings 24. The sleeves 22 are attached to the gown body 12 at the sleeve openings 24 by any conventional attaching means. In an alternate embodiment, the gown body 12 may be formed from separate panels of the same or different materials that are attached or adheared along seams.

For example, the back panels 18 may be panels of material adhered to a front panel of material defining the front portion 14 along sides seams 19 (FIG. 3A). Patches of elastomeric material 34 are formed into areas 32 of the gown body 12 generating the greatest restrictive forces. The location of such areas is not limiting and may vary depending on the wearer's style configuration, and size of the gown. A method for precisely defining such areas 32 is described in greater detail below. In the illustrated embodiment, the areas 34 are defined in the back shoulder portions of the gown body 12. The geometric shape of the elastomeric patches 34 may vary depending on the size and shape of the areas 32 of the gown body 12 generating the restrictive forces. The back shoulder areas 32, a more precise shape of the patches 34 is possible.

In FIGS. 2A and 2B, the patches 34 are generally crescent shaped and follow the contour of the sleeve openings 24. The crescent shapes extend laterally between the sleeve openings 24 and longitudinal edges 20 of the back panels 18. As can be seen in the figures, the patches 34 are generally completely surrounded by the gown body material, which may be non-elasticomer or less elastomerous than the patches 34. In this regard, the patches may be thought of as "islands" of elastomer material corresponding to the location of the restrictive force areas 32.

For the back shoulder regions of a gown 10, it has been found that the patches 34 may have various shapes and extend laterally along the back portions 18 and extend longitudinally from the sleeve openings or extend into the longitudinal edges 20 of the back portions 18, and extend longitudinally from a point below an underside 30 of the sleeves 22 to point between the underside 30 and a top edge 28 of the gown body 12. Referring to FIGS. 2B, 3D, and 4B, the longitudinal dimension 36 of the patches 34 may be greater than the lateral dimension 36. In one embodiment, the patches 34 may extend at least about one-third of the length between the underside 30 of the sleeves 22 and the top edge 28 of the gown body 12. For example, the patches 34 may extend...
about one-half of the length between the underside 30 of the sleeves and top edge 28 of the gown body.

The elastomeric patches 34 are stretchable in the general directions of the tensile forces exerted on the areas 32. For example, if the patches 34 are located in the back shoulder regions as illustrated in the figures, the patches 34 are stretchable at least in the lateral direction across the back of a wearer. The arrow lines in FIGS. 2B, 3B, and 4B conceptually illustrate the general stretch directions of the patches 34 located in the back shoulder regions of the respective gowns in FIGS. 2A, 3A, and 4A. In an embodiment wherein the areas 32 are subjected to longitudinal stretching forces (for example, at the back waist region when the wearer bends over), the patches 34 may be stretchable at least in the longitudinal direction. It may be desired that the patches 34 be elastomeric in all general directions to maximize benefit of the patches.

The patches 34 are formed into the gown material by any suitable method. For example, the patches may be sonically or ultrasonically welded to the gown material. The patches 34 may be stitched, taped, or adhered to the gown material. Any one of a number of known conventional attaching methods may be used for this purpose.

Various elastomeric materials are known in the art that may be used for the patches 34. The patches 34 may, for example, be composed of a single layer, multiple layers, laminates, spunbond fabrics, films, meltblown fabrics, elastic netting, microporous web, bonded carded webs or foams comprised of elastomeric or polymeric materials. Elastomeric nonwoven laminate webs may include a nonwoven material joined to one or more gatherable nonwoven webs, films, or foams. Stretch-bonded-laminates (SBL) and Neck-bonded-laminates (NBL) are examples of elastomeric nonwoven laminate webs. Nonwoven fabrics are any web of material which has been formed without the use of textile weaving processes which produce a structure of individual fibers which are interwoven in an identifiable repeating manner. Examples of suitable materials are Spunbond-Meltblown-Meltblown fabrics, Spunbond-Meltblown-Spunbond fabrics, Spunbond fabrics, or laminates of such fabrics with films, foams, or other nonwoven webs. Elastomeric materials may include cast or blown films, foams, or meltblown fabrics composed of polyethylene, polypropylene, or polyolefin copolymers, as well as combinations thereof. The elastomeric materials may include polyether block amides such as PEBAX® elastomer (available from AtoChem located in Philadelphia, Pa.), thermoplastic polyurethanes (e.g., both aliphatic-polyether and aliphatic-polyester types), HYTREL® elastomeric copolyester (available from E.I. du Pont de Nemours located in Wilmington, Del.), KRA-TON® elastomer (available from Shell Chemical Company located in Houston, Tex.), or strands of LYCRAB® elastomer (available from E.I. du Pont de Nemours located in Wilmington, Del.), or the like, as well as combinations thereof. The patches 34 may include materials that have elastomeric properties through a mechanical process, printing process, heating process, or chemical treatment. For example, the materials may be stretched, heat activated, embossed, and micro-strained, and may be in the form of films, webs, and laminates.

In one particular embodiment, the elastomeric patches 34 are a neck-bonded laminate of a necked non-woven web of spunbond polypropylene laminated to an elastic film, for example a 6.8 gsm PEBAX film with 16% (by weight) of pigment grade titanium dioxide particles. FIG. 3A is a perspective view of an alternate embodiment of a gown 10 according to the invention. The gown 10 is similar to the gown described above with respect to FIG. 2A with the exception of the elastomeric patches 34. In this embodiment, the patches 34 have an overall elongated trapezoidal profile with a straight edge that is generally parallel to the sleeve seam 24. This edge extends slightly below the underside 30 of the sleeve 22 and extends in the opposite direction generally to adjacent the top edge 28 of the gown. However, as described in greater below, the upper portion of the patches 34 may extend beyond areas of the gown body subjected to tensile stressing forces and, thus, may not be necessary.

It may be found that the elastomeric patches 34 do not need to extend generally beyond one-half of the distance or length between the underside 30 of the sleeve 22 and the top edge 28 of the gown body. The elastomeric panel 34 is shown in an enlarged view in FIG. 3B. As can be seen from this figure, the panel 34 has a longitudinal dimension 32 that is significantly greater than the lateral dimension 36.

A method according to the invention may be used to fairly precisely define or map out the areas in a protective garment, such as not limited to a surgical gown, subjected to tensile stressing forces. Once defined, these areas may be substituted with elastomeric patches as described above. The applicants have found that an accurate method for mapping these areas is to place oversized elastomeric patches in the regions of the garment generally noted by individuals as applying restrictive forces in normal use of the garment. For example, users typically note that a noticeable restrictive force is placed across the back upper shoulder regions of surgical gowns, particularly when the users extend their arms forward. Other restrictive forces may be felt, for example, in the waist regions when the user bends forward or leans sideways, etc.

Once suspected or generalized areas have been identified, an oversized area of the gown corresponding to such locations may be removed from a prototype or 'working' model of the gown (i.e. cut out of the gown). Pieces of elastomeric material may then be attached to the gown superimposed over the cut out areas. In an alternate embodiment, the working model may be formed essentially entirely of an elastomeric material. A grid is then defined on the elastomeric material. The grid may be, for example, a block pattern, line pattern, etc. The grid essentially provides an array of distinct marks or lines that will change relative position upon application of tensile stress and the change in relative position is measured and the areas of maximum relative change between the marks correspond to the areas of greatest tensile stress and thus the areas of greatest restrictive force felt by the wearer. The areas of least relative change between the marks corresponds to the areas of least tensile stress. Areas wherein the marks essentially do not change correspond to areas of the gown that are not generally susceptible to tensile stress, and thus to areas that will not benefit by substitution of elastomeric material.

For example, referring to FIGS. 2A and 2B, the crescent shape patches 34 were first attached to the gown in the position shown in FIG. 2A, and then the gown material occluded by the patches 34 was removed. A grid of three arrays of spaced apart lines was marked onto the patches 34 in the locations indicated by the arrows A, B, and C in FIG. 2B. The lines were relatively small vertical lines spaced about one centimeter apart. The arrays of lines thus resembled the markings on a conventional measuring tape. The first array A was defined approximately 20 centimeters from the top edge 28 of the gown body 12. The second array B was defined approximately 25 centimeters from the top edge 28, and the third array C was defined approximately 34
9 centimeters from the top edge 28 and slightly angled with respect to the other arrays, as illustrated generally in FIG. 2B. The gown 10 was donned and the wearer instructed to move about so as to generate the tensile stretching forces in the back shoulder regions, for example by extending the arms outward in front of their torso and crossing the arms. Under this condition, the change in the spacing between the lines was measured. The material along the first array B extended or stretched 40 percent (the material had a stretched length of 140 percent of its relaxed length), the elastomeric material along the second array C extended 50 percent, and the elastomeric material along the third array D extended 25 percent. Upon the wearer releasing the arms, the grid lines along the array returned to their initial spacing indicating that the restrictive forces were stopped.

It should be appreciated that this grid mapping technique may be utilized to accurately determine the locations of tensile forces generated anywhere on a garment body resulting in restrictive forces against the wearer. The method is empirical by nature and there will obviously be some degree of trial and error. However, by widening the grid areas and measuring different patterns resulting from various movements of a wearer, areas 32 that are subjected to tensile forces may be accurately determined and, if desired, substituted with elastomeric patches 34, as described above.

With respect to the embodiments of FIGS. 3A and 3B, the length of the elastomeric patches 34 was longitudinally extended or stretched 50 percent along the bottom edge 28 of the gown body 12 to determine to what extent tensile forces are generated closer to the top edge 28. Five arrays of grid lines A through E were defined on the elastomeric patches 34 at the positions and direction indicated in FIG. 3B. The elastomeric panel was positioned in the gown body 12 to include the area in the upper back panel adjacent to the sleeve as well as the area adjacent to the underarm of the sleeve. A border of the original non-elastomeric gown material was retained around the neck and sleeve edges to facilitate positioning and retaining of the elastomeric material. The first array of lines A were defined 16 centimeters from the top edge 28. The second array defined at 22 centimeters from the top edge, the third array C at about 29 centimeters from the top edge, the fourth array D at about 39 centimeters from the top edge, and the fifth array E at about 46 centimeters from the top edge of the gown. The gown was then donned and subjected to the same conditions as described above with respect to the other gowns. It was noted that the grid patterns A, B, and C for the patches 35 indicated no extension or stretch of the materials. Thus, it was accurately determined that this portion of the gown body was not subjected to tensile stretching forces and did not contribute to restrictive forces felt by the wearer.

Aspects of the method according to the invention are illustrated generally in FIGS. 5, 6A, and 6B. A method in accordance with the invention for making a protective garment having at least one patch of elastomeric material formed therein may include providing a working model or prototype of the garment, and providing elastomeric material in areas of the garment believed to be subjected to tensile stretching forces when the garment is worn by a wearer. Referring to FIG. 5, a working model or prototype garment 100 is illustrated. In this embodiment, at least the back 16 of the gown is formed by panels of elastomeric material. It may be desired that the entire gown body 12 be formed of elastomeric material. A pattern of marks are defined on the elastomeric material. The marks may take on any defined pattern. For example, the marks may be defined as spaced apart longitudinally oriented lines, spaced apart transversely oriented lines, or a combination of transverse and longitudinal lines. For example, in the illustrated embodiment, the marks are defined essentially by a parallelogram pattern, for example a pattern of squares or rectangles. Any suitable pattern of marks may be used in accordance with the invention.

Referring to FIG. 6A, the working garment 100 is donned by a wearer and the garment is subjected to conditions to induce the tensile stretching forces. For example, the wearer may conduct various movements or ranges of movements to induce the tensile stretching forces. In the illustrated embodiment, the wearer has raised and extended his arms forward, and may cross the arms to induce maximum tensile stretching forces. As is graphically illustrated in FIG. 6A, as the elastomeric material in the areas of the gown subjected to tensile stretching forces elongates, the grid pattern markedly changes. This can be particularly seen in the back shoulder areas of the illustrated example in FIG. 6A. FIG. 6B is an enlarged view of the back shoulder area and particularly illustrates the change in the shape and orientation of the marks.

By detecting and measuring the change and relative positions of the marks resulting from stretching of the elastomeric material, one is able to map the areas of the garment subjected to tensile stretching forces and to determine the relative amount of stress or stretching forces by the magnitude of the change in spacing or orientation of the marks. Once the areas have been mapped, it is possible to produce production gowns wherein patches of elastomeric material are substituted for the generally non-elastomeric gown material in the mapped areas that are subjected to the tensile stretching forces.

It should be appreciated that the method is not limited to any particular grid pattern or measurement technique. The grid pattern may be disposed to detect generally only stretching of the elastomeric material in a generally transverse direction. Likewise, the pattern may be defined so as to determine the degree of stretching of the elastomeric material in a generally longitudinal direction. Desirably, the
grid pattern may be defined so as to determine the degree of stretching of the elastomeric material in both a generally transverse and generally longitudinal direction. All such variations are in accordance with the scope and spirit of the invention.

It should be appreciated by those skilled in the art that the system and method according to the invention have wide applications, and that the example and embodiments set forth herein are merely exemplary. It is intended that the present invention include such uses and embodiments as come within the scope and spirit of the appended claims.

What is claimed is:

1. A method for making a protective production garment having at least one patch of elastomeric material formed therein, said method comprising:
   - with a working model of the garment, providing an elastomeric material in areas believed to be subjected to tensile stretching forces when worn by a wearer;
   - defining a pattern of marks on the elastomeric material;
   - subjecting the garment to conditions to induce the tensile stretching forces;
   - detecting and measuring the change in relative positions of the marks resulting from stretching of the elastomeric material;
   - mapping the areas of the garment subjected to tensile stretching forces based on the degree of stretching indicated by the marks; and
   - providing patches of elastomeric material in production garments in at least one of the mapped areas subjected to tensile stretching forces.

2. The method as in claim 1, wherein the modeling garment has a body formed generally entirely of the elastomeric material.

3. The method as in claim 1, wherein the production garments are formed of a generally non-elastomeric material, the patches of elastomeric material surrounded by the non-elastomeric material.

4. The method as in claim 2, wherein the patches of elastomeric material are attached to the non-elastomeric material by one of a thermal bonding, ultrasonic bonding, and adhesive process.

5. The method as in claim 1, wherein the pattern of marks are defined as arrays of spaced apart lines, the degree of stretching of the elastomeric material in one direction determined by the change in spacing between the lines.

6. The method as in claim 5, wherein the degree of stretching of the elastomeric material in a generally transverse direction is determined by elongation of the lines.

7. The method as in claim 1, wherein the pattern of marks is defined so as to determine the degree of stretching of the elastomeric material in a generally opposite direction.

8. The method as in claim 1, wherein the pattern of marks is defined so as to determine the degree of stretching of the elastomeric material in a generally longitudinal direction.

9. The method as in claim 1, wherein the pattern of marks is defined so as to determine the degree of stretching of the elastomeric material in a generally transverse and generally longitudinal direction.

10. The method as in claim 9, wherein the pattern of marks is defined as a pattern of generally transverse lines and longitudinal lines.

11. The method as in claim 10, wherein the pattern of marks is defined as parallelograms.

12. A method for defining areas of a garment that are subjected to tensile stretching forces when worn by a wearer, said method comprising:
   - providing a working model of the garment having an elastomeric material in areas believed to be subjected to tensile stretching forces when worn by a wearer;
   - defining a pattern of marks on the elastomeric material;
   - subjecting the garment to conditions to induce the tensile stretching forces;
   - detecting and measuring the change in relative positions of the marks resulting from stretching of the elastomeric material; and
   - mapping the areas of the garment subjected to tensile stretching forces based on the degree of stretching indicated by the marks.

13. The method as in claim 12, wherein the elastomeric material and marks are provided in the working model in localized areas encompassing areas believed to be subjected to tensile stretching forces.

14. The method as in claim 12, wherein the body of the working model of the garment is formed of the elastomeric material with the marks defined thereon.

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