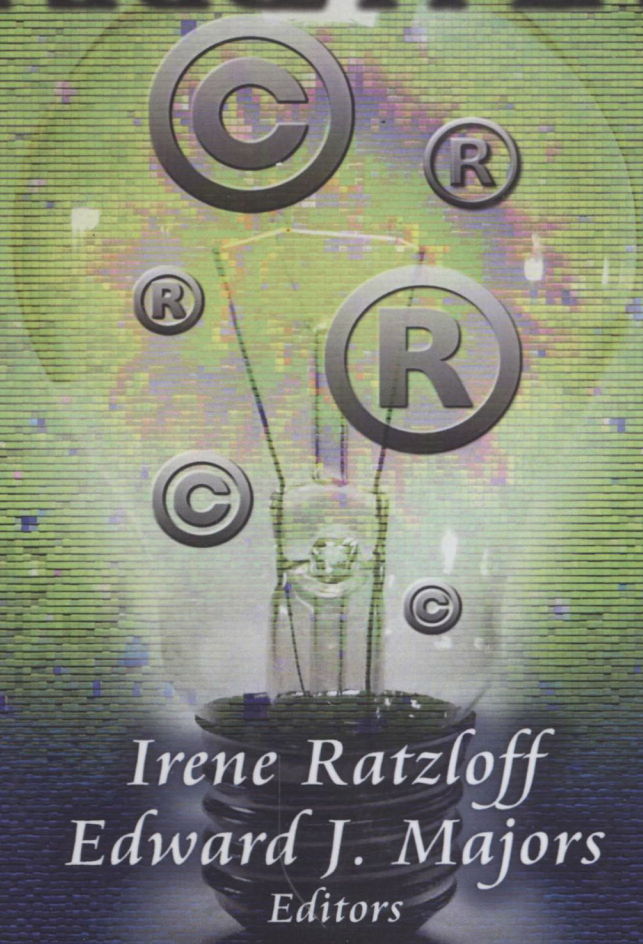


Business Issues, Competition and Entrepreneurship

INTELLECTUAL PROPERTY AND THE PATENT MARKETPLACE



*Irene Ratzloff
Edward J. Majors*
Editors

EVOLUTION, NOTICE *and* REMEDIES

NOVA

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**IRENE RATZLOFF
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PREFACE

Innovation benefits consumers through the development of new products, processes and services that improve lives and address unmet needs. It is key to meeting society's greatest challenges in areas as diverse as energy production, communications and health care, and it is essential to sustained economic growth and global competitiveness. But innovation is a complex process. It involves a series of steps from idea to invention through development to commercialization, each of which can be expensive, risky, and unpredictable. The goal of the patent system is to promote innovation in the face of that expense and risk. This book begins by examining the role of technology markets and patent markets in innovation today. Chapter 1 discusses collaboration and technology transfer which have become increasingly important pathways to innovation with significant benefits for consumers. Chapter 2 describes the increasing activity and complexity of business models in markets for patents that do not involve technology transfer, and Chapter 3-8 make recommendations for adjustments to the legal rules and practices governing notice and remedies to better align them with competition policy without undermining patent law's support for innovation.

These chapters are an edited, reformatted and augmented version of a Federal Trade Commission, dated March 30, 2011.

INTRODUCTION

Innovation benefits consumers through the development of new products, processes and services that improve lives and address unmet needs. It is key to meeting society's greatest challenges in areas as diverse as energy production, communications and health care, and it is essential to sustained economic growth and global competitiveness. But innovation is a complex process. It involves a series of steps from idea to invention through development to commercialization, each of which can be expensive, risky and unpredictable.

The goal of the patent system is to promote innovation in the face of that expense and risk. It does so by giving patent owners the right to exclude others from making, using or selling a patented invention for 20 years. By preventing copying that might otherwise drive down prices, the patent system allows innovators to recoup their investment in research and development (R&D). The patent system plays a critical role in promoting innovation across industries from biotechnology to nanotechnology, and by entities from large corporations to independent inventors.

The patent system's exclusive right promotes innovation, but so too does competition, which drives firms to produce new products and services in the hope of obtaining an advantage in the market. The patent system and the antitrust laws share the fundamental goals of enhancing consumer welfare and promoting innovation. The legal doctrines that most successfully accomplish those goals align the patent system and competition policy so that one does not undermine the effectiveness of the other. One important aspect of that alignment is antitrust enforcement that recognizes the incentives to innovate created by the patent system.

Condemning efficient, legitimate uses of patent rights can undermine those incentives and harm consumers. For that reason, the guidance of the 2007 FTC/DOJ Report on IP and Antitrust focused on incorporating careful consideration of the benefits of patent rights into antitrust analysis.¹ Another aspect of that alignment is a proper balance between exclusivity and competition. Invalid or overbroad patents disrupt that balance by discouraging follow-on innovation, preventing competition, and raising prices through unnecessary licensing and litigation. For that reason, many of the recommendations in the 2003 FTC IP Report focused on improving patent quality as a means of balancing exclusivity and competition.²

Two areas of patent law beyond patent quality impact how well the patent system and competition policy work together to further their common goal of enhancing consumer welfare. The first is notice – how well a patent informs the public of what technology is protected. The second is remedies – judicially awarded damages and injunctions following a

court finding of patent infringement. The impact of notice and remedies on the alignment of the patent system with competition policy results from the operation of relevant legal rules and practices on competition among patented technologies.

A patent does not necessarily confer market power because patented inventions often compete with alternative technologies. Patentees can earn rewards in the market by selling a patented product themselves or by licensing the patent for others to practice. In either case, the market reward earned by the patentee, and the economic value of the invention, will depend upon the extent to which consumers prefer the patented technology over alternatives. A patent covering a highly valued, disruptive technology can confer market power and generate significant market rewards. More often, competition from acceptable alternatives will limit the market reward that a patent owner receives.

Competition among patented technologies at every stage of the innovation process helps generate lower prices, more choices and higher quality products for consumers. Products compete to be purchased by consumers. Developed technologies compete in technology markets to be chosen for incorporation into products. Early-stage technologies compete for development funding. By aligning the patentee's market reward with consumer preferences, competition in product and technology markets encourages investment in those inventions that are more likely to be valued by consumers. When patent law facilitates and does not distort this competition, it aligns with competition policy to the benefit of consumers.

FTC Hearings on the Evolving IP Marketplace

To explore the interplay of notice, remedies, innovation and competition, the FTC held eight days of hearings beginning December 2008. In addition, the FTC cosponsored a workshop with the Patent and Trademark Office (PTO) and the Department of Justice in May 2010, on the intersection of patent policy and competition policy. The hearings and workshop involved more than 140 participants, including business representatives from large and small firms, start-ups and the independent inventor community, leading patent practitioners, economists, and patent law scholars. The FTC also received over 50 written submissions.³ This report is based on testimony, written submissions and independent research.

The report begins by examining the role of technology markets and patent markets in innovation today. Those roles have evolved in recent years in ways that heighten the importance of patent notice and remedies to competition among technologies. As Section 1 discusses, collaboration and technology transfer have become increasingly important pathways to innovation with significant benefits for consumers. Patents play an important role in supporting these technology markets, and undermining that role would harm innovation. At the same time, as described in Section 2, we see increasing activity and complexity of business models in markets for patents that do not involve technology transfer. In these markets, patents are bought, sold and licensed as assets whose value is based on their ability to extract rents from manufacturers already using the patented technology. This activity risks distorting competition among technologies and deterring innovation, especially when driven by poor patent notice and remedies that do not align with the economic value of the patented invention. Sections 3 through 8 make recommendations for adjustments to the legal rules and practices governing notice and remedies to better align them with competition policy without undermining patent law's support for innovation.

How Patent Notice Affects Innovation and Competition

Clear notice of what a patent covers can increase innovation by encouraging collaboration, technology transfer and design-around. Clearly defined patent rights can help companies identify and license technology they wish to develop or adopt. Poor patent notice can undermine the patent system's ability to fulfill this role, however. Potential collaborators or licensees may not find relevant patents, or they may hesitate to invest in technology when the scope of patent protection is unclear.

Notice affects competition among technologies at every stage of the R&D process. The ability to identify and assess the scope of relevant patents at an early stage can be critical for firms considering making investments in developing and commercializing an innovative product. They may unnecessarily elect not to pursue a R&D effort when the scope of coverage is unclear if they fear that another firm has blocking patents. Such decisions deter and lessen innovation and competition among technologies that might otherwise have been created. Poor patent notice also hinders competition by forcing firms to design products with incomplete knowledge of the cost and availability of different technologies. Technologies compete to be incorporated into products. But that competition is distorted if designers cannot discern in advance which technologies carry the cost of patent royalties and negotiate those royalties before they incur sunk costs based on the patented technology.

When firms choose technologies and market products despite an uncertain patent landscape, they risk post-launch patent assertions and litigation. As described in Sections 2 and 3, resolving these claims often involves expensive litigation, which diverts resources and disrupts business operations. If the firm pays royalties, costs may increase and consumers may be deprived of the full benefit of competition among technologies.

Firms can invest in patent clearance activities – attempts to identify patents that might read on their planned activities – to reduce uncertainty and avoid later infringement allegations. Such efforts are often expensive. In the information technology (IT) industries, where products consist of many components covered by numerous patents, firms may not reliably identify all relevant patents. When they do identify patent risks, firms may unnecessarily design around those risks or take a license due to unclear patent scope. To the extent that patent clearance and product design are made more expensive by poor notice, they impose unnecessary costs.

As discussed in Section 3, a firm attempting patent clearance must undertake three activities. One is claim interpretation. To fulfill their notice function, patent claims must clearly delineate the scope of patent rights. A second is predicting what claims might emerge from pending patent applications. A third is identifying potentially relevant patents or applications. Effective patent notice supporting each one of these activities implicates multiple legal rules and practices, including claim interpretation, specification requirements and application examination. Section 3 examines those rules and practices and makes recommendations for improving patent notice. Doing so would better align patent law and competition policy by allowing competition among technologies to function more effectively.

How Patent Remedies Affect Innovation and Competition

Effective patent remedies are critical to the patent system's incentives to innovate. Patent infringement interferes with a patentee's ability to realize its patent's value in the

marketplace. Remedies protect the ability of patentees to earn returns in the market by stopping and deterring infringement in the case of injunctions, and by making patentees whole through damage awards when infringement has occurred. As explained in Section 4, to perform that role, patent remedies should seek to replicate the market reward that the patent holder would have earned absent infringement.

Compensatory damage awards that either under or overcompensate patentees for infringement compared to the market can have detrimental effects on innovation and competition. Undercompensation can undermine the patent system's incentives to innovate. This could impair investment in R&D and result in fewer new, innovative products and services. Damage awards that exceed what the invention could have earned absent infringement when competing with alternatives can lead to higher prices. Consumers are effectively deprived of the benefit of competition among technologies. Overcompensation can also encourage speculation in patent rights and litigation. As discussed in section 2, this can deter innovation by raising the costs and increasing the risks of investment. Moreover, damages law that systematically overcompensates certain types of inventions can over-incentivize invention and patenting in that field. This outcome can disrupt the market's ability to allocate R&D resources to those areas most likely to generate the products most valued by consumers.

Calculating patent damages that replicate the market reward for the invention by constructing the world but for infringement can be a very difficult task for litigants and factfinders. Over the years, courts have developed an extensive jurisprudence surrounding the calculation of patent damages. While the fundamental principles of damages law are sound, some legal rules and practices are not well-grounded in economic analysis. For instance, some rules do not reflect a full appreciation of the appropriate role of competition from non-infringing alternatives in determining patent damages. Trial practice has allowed ill-supported damages testimony into evidence. Sections 4 through 7 develop an economically grounded approach to calculating patent damages and recommend changes to better align patent law and competition policy by producing damage awards that more closely replicate the market value of the invention.

Permanent injunctions prohibiting future infringement play a critical role in protecting the exclusivity that allows a patentee to reap the market reward for its invention. Following a finding of infringement, an injunction preserves the patentee's exclusivity going forward. Just as importantly, the threat of an injunction creates a significant deterrent to infringement, which allows patentees to obtain the full market reward for the invention, supported by an exclusive market position, without costly litigation.

Under some circumstances, however, the threat of an injunction can lead an infringer to pay higher royalties than the patentee could have obtained in a competitive technology market. At the time a manufacturer faces an infringement allegation, switching to an alternative technology may be very expensive if it has sunk costs in production using the patented technology. That may be true even if choosing the alternative earlier would have entailed little additional cost. If so, the patentee can use the threat of an injunction to obtain royalties covering not only the market value of the patented invention, but also a portion of the costs that the infringer would incur if it were enjoined and had to switch. This higher royalty based on switching costs is called the "hold-up" value of the patent. Patent hold-up can overcompensate patentees, raise prices to consumers who lose the benefits of competition among technologies, and deter innovation by manufacturers facing the risk of hold-up.

One challenge for injunction analysis is to protect the critical importance of patent exclusivity for innovation while recognizing that, in some instances, patent hold-up can undermine innovation and harm consumers. Section 8 proposes an approach that balances these concerns within the equitable analysis required by *eBay v. MercExchange*.⁴ The proposed approach aligns patent law and competition policy by preventing hold-up based on sunk costs when innovation would not be harmed.

EXECUTIVE SUMMARY

CHAPTER 1: EVOLVING PATHWAYS OF INNOVATION: OPEN INNOVATION, TECHNOLOGY TRANSFER AND EX ANTE PATENT TRANSACTIONS

Understanding what changes to the law of patent notice and remedies would increase innovation and better align the patent system and competition policy requires that we first examine how the pathways to innovation and the role of patents in promoting innovation have evolved. In one significant change, many firms have increasingly embraced “open innovation.” In a traditional or closed model of innovation, a firm relies on its own research and development (R&D) to create the products it markets. But a firm that pursues an open innovation strategy recognizes that valuable ideas can originate with others and seeks to acquire those inventions that fit its business model. Many of the inventions acquired and commercialized by large firms originated with start-ups and small companies, which have accounted for a steadily increasing percentage of R&D spending over the past 30 years.

Consumers benefit from open innovation strategies. The growth of technology transfer has permitted a division of labor to emerge between those who invent and those who manufacture most efficiently. This division of labor speeds up the rate of innovation and results in broader, faster distribution of new products to consumers. By providing a pathway for invention without commercialization, technology transfer also lowers barriers to entry for inventors who do not have access to the capital required to build manufacturing facilities and establish distribution channels. Easier entry supports additional sources of invention, which increases competition among technologies to be further developed and incorporated into products. That competition benefits consumers by generating better, cheaper products. Moreover, competition among early-stage technologies for development funding is an important mechanism for allocating scarce resources to those inventions having the greatest chance of generating the products most valued by consumers.

The patent system facilitates open innovation and technology transfer in ways that implicate patent quality, patent remedies and the notice function. The exclusive patent right creates incentives for sellers of technology to invent, and for buyers of technology to purchase and invest in further development. But the nature and effectiveness of the exclusive patent right depend in part on the remedies available for its infringement. Damages must make a patent owner whole or infringement will undermine the patent system’s incentives to

innovate. Permanent injunctions must deter infringement and protect the exclusivity. Good notice of patent rights encourages investment in new technologies. But poor quality patents can discourage innovation by creating uncertainty and raising costs.

Patents also facilitate open innovation and technology transfer by creating rights based on intangible concepts, which makes contracting easier and helps create a market for ideas. In a technology transfer agreement, patents often define the rights to be transferred. Thus, patent transactions (licensing or sales) form the basis of many technology transfer agreements. Patent transactions that occur as part of a technology transfer agreement can be considered *ex ante* because they occur before the purchaser has obtained the technology through other means. Such *ex ante* patent transactions accompanied by technology transfer are an important means for advancing innovation, creating wealth, and increasing competition among technologies.

CHAPTER 2: THE EVOLVING PATENT MARKETPLACE: EX POST PATENT TRANSACTIONS

While the open innovation model and technology transfer are important pathways to innovation, not all patent licensing and sales occur *ex ante* as part of a technology transfer agreement. In many cases, the licensee or purchaser already uses the patented technology when approached by the patent owner, but it lacks a license to use the technology. These patent transactions occur *ex post*, *after* the firm accused of infringement has invested in creating, developing or commercializing the technology. The firm needs the *ex post* license to avoid liability, even if it invented or obtained the technology independent of the patentee, because patent infringement is a strict liability offense.

The ability of patentees to assert their patents against infringers is important to the patent system's role in promoting innovation and facilitating technology transfer. The threat of a patent infringement suit deters infringement and safeguards the exclusivity that is the heart of the patent system. A business model based on invention followed by technology transfer will only succeed if a firm can prevent copying and recoup its investment in R&D.

But *ex post* licensing to manufacturers that sell products developed or obtained independently of the patentee can distort competition in technology markets and deter innovation. The failure of the patentee and manufacturer to license *ex ante* with technology transfer results in duplicated R&D effort. When a manufacturer chooses technology for a product design without knowledge of a later-asserted patent, it makes that choice without important cost information, which deprives consumers of the benefits of competition in the technology market. If the manufacturer has sunk costs into using the technology, the patentee can use that investment as negotiating leverage for a higher royalty than the patented technology could have commanded *ex ante*, when competing with alternatives. The increased uncertainty and higher costs associated with *ex post* licensing can deter innovation by manufacturers.

Increasing activity by patent assertion entities (PAEs)⁵ in the information technology (IT) industry has amplified concerns about the effects of *ex post* patent transactions on innovation and competition. The business model of PAEs focuses on purchasing and asserting patents

against manufacturers already using the technology, rather than developing and transferring technology.

Some argue that PAEs encourage innovation by compensating inventors, but this argument ignores the fact that invention is only the first step in a long process of innovation. Even if PAEs arguably encourage invention, they can deter innovation by raising costs and risks without making a technological contribution.

The clear benefits for innovation and competition stemming from ex ante patent transactions contrast with the detrimental and ambiguous effects of ex post transactions. An important goal in aligning the patent system and competition policy is to facilitate ex ante transactions while making ex post transactions less necessary or frequent.

Improving the notice function of patents would help with both. Manufacturers often license ex post because they were not aware of the patent ex ante. Multiple factors can contribute to notice failure, including overbroad, vague claims, the large number of patents potentially relevant to IT products, and the pendency of patent applications in the Patent and Trademark Office (PTO). More clearly defined patent rights could help companies better find and license technology they wish to develop ex ante, which would support technology transfer. Better notice could also help companies obtain licenses or design around patents in advance of marketing a product, thereby decreasing the amount of ex post licensing.

Remedies law requires a careful balance to accomplish the goal of facilitating ex ante transactions while reducing the frequency of ex post transactions. On the one hand, any adjustments to remedies law must be careful not to undermine the patent system's incentives to innovate. On the other hand, if remedies overcompensate patent owners compared to the market reward absent infringement, they can distort competition and encourage patent speculation. Improvements in both notice and remedies law, as discussed in the following sections, can better align the patent system with competition policy and balance these concerns.

CHAPTER 3: PATENT NOTICE: A COMPETITION PERSPECTIVE

The Nature and Sources of Notice Problems

The hearings examined three principal notice challenges, listed below. Numerous IT panelists indicated that notice problems were substantial, often leading firms to abandon patent “clearance” efforts. In contrast, panelists from the pharmaceutical and biotech sectors generally found patent notice sufficient for effective, albeit sometimes costly, clearance searches.

Difficulty Interpreting the Boundaries of Issued Claims

To fulfill their notice function, patent claims must delineate the scope of patent rights with sufficient clarity that a person skilled in the relevant art can reliably determine whether planned activities would infringe. The hearings explored several interrelated sources of ambiguity or uncertainty:

- Language is inherently imprecise.

- Some art areas, such as software, lack clear nomenclature and common vocabularies for claiming.
- Claiming using functional language, which describes what the invention does rather than what it is, can produce abstract, ambiguous claims.
- Some applicants may have incentives to draft ambiguous claims that might be viewed narrowly by the PTO and then construed broadly in litigation.
- PTO examination often focuses on issues of novelty and nonobviousness and may result in deferring clarification of claim boundaries until litigation.

Claims That May Issue from Pending Applications

Because products can infringe subsequently issued patents, an effective clearance search should include pending applications. A requirement that most applications be published 18 months after filing provides a partial solution. However, applications can be amended during examination, provided that there is sufficient support in the specification. Adequacy of notice depends on whether the application is published and the extent to which the specification enables third parties to foresee the claims that may emerge.

Difficulty of Identifying and Reviewing Published Patents

IT panelists described the difficulty in performing patent clearance that results from the sheer number of relevant patents, potentially numbering in the thousands. They explained that IT products typically contain many different components, each of which may be covered by numerous patents. They also reported that reliably identifying all patents that might be asserted was undermined by the lack of predictable vocabulary and frustrated by short product cycles. Panelists from other industries generally found clearance searches manageable.

Guideposts and Trade-offs

We examine possible notice enhancements with several guideposts in mind. Cost is obviously important. Often, patent applicants are best positioned to supply low-cost, but very valuable, information. Timing is another key consideration. Notice is more beneficial to third parties when they are still planning their R&D strategies and before they make sunk investments that may expose them to hold-up. Accordingly, many of the suggested improvements look to the examination process, rather than to litigation.

Trade-offs between notice and scope pose particularly thorny issues, and it is vital that they be approached with a full understanding of the notice implications. Divergence in the extent and nature of notice problems among industries also poses challenges. We look for ways to improve notice in problem areas without impairing the patent system elsewhere and without sacrificing the benefits of a unitary patent system, with doctrines applicable across technologies.

Improving the Ability to Understand Existing Claims: Indefiniteness

Under Section 112, second paragraph of the Patent Act, 35 U.S.C. § 112, claims must “particularly point[] out and distinctly claim[] the subject matter which the applicant

regards as his invention.” Otherwise, the claims are invalid on grounds of “indefiniteness.” An indefiniteness standard that weeds out claims reasonably susceptible to multiple interpretations could reduce ambiguity and improve notice in a broad range of settings.

PTO Review

The Federal Circuit requires that claims be “insolubly ambiguous” to be invalid as indefinite.⁶ The PTO Board of Patent Appeals and Interferences has adopted a lower threshold of ambiguity, however, by ruling that a claim may be indefinite if it is “amenable to two or more plausible claim constructions.”⁷

Miyazaki approaches indefiniteness with a focus on notice. In contrast, the “insolubly ambiguous” standard accepts substantial ambiguity. It preserves claims that require a court to make hard choices among varying interpretations, thereby overstating what marketplace participants are likely to understand. The *Miyazaki* approach is preferable when implemented during PTO review. In the PTO, indefiniteness rulings promptly add clarity and require only a claim amendment from the applicant.

Recommendation

In assessing indefiniteness, the PTO should adhere to the principle articulated in *Miyazaki*.

Functional Claims

The Federal Circuit has also recognized notice concerns in recent rulings finding computer-implemented means-plus-function claims indefinite.⁸ In each case, the invalidated claims covered a function implemented by means of a computer or microprocessor, but the specification provided no details regarding the relevant program. The court ruled that without disclosing in the specification some form of algorithm for performing the claimed function – not necessarily anything highly detailed – the applicant had not satisfied definiteness requirements. This presents a helpful opportunity to enhance notice regarding software patents, but the reach of the “algorithm” requirement is still uncertain. The rulings also point the way toward steps that would add clarity to functional claims that fall outside the means-plus-function format.

Recommendation

The Commission recommends that courts give weight to notice objectives as they further explicate the circumstances in which a patent’s specification sufficiently supports a means-plus-function claim. Those objectives require sufficiently detailed structure to inform the public of the means that fall within and outside of the claim’s scope. Similar concerns apply more broadly, and the Commission urges that courts extend their recent focus on indefiniteness to address functional claiming in general.

Improving the Ability to Understand Existing Claims: Enhancing the Value of the Specification for Claim Construction

Claim construction raises a set of issues with profound notice implications. Claims are interpreted “in light of the patent specification,” but this principle often leaves significant ambiguity regarding claim coverage. Hearing testimony focused on enhancing the value of the specification for claim construction through more stringent enforcement of Section 112, at least in the IT industry, and by defining claim terms.

Enforcement of 35 U.S.C. § 112, ¶ 1

Panelists stressed the importance of calibrating claim scope to the specification for predictable claim construction and effective public notice. As claims extend farther beyond the invention expressly described in the specification, their boundaries become more ambiguous. Patent law achieves that calibration through two requirements recited in 35 U.S.C. § 112, the written description requirement and the enablement requirement.⁹ There was considerable testimony, however, that the written description and enablement requirements have been much less stringently enforced in IT industries than elsewhere, leading to concerns over ambiguous scope. The hearings suggested several ways to address this issue.

Whether a specification sufficiently supports a patent’s claims under Section 112 is assessed through the eyes of the hypothetical “person having ordinary skill in the art,” or PHOSITA. What the PHOSITA is likely to understand or find demonstrated is a reasonable proxy for what third parties are likely to perceive. Some analysts have argued that, at least for Section 112 purposes, the level of skill attributable to the PHOSITA has been set too high in IT contexts and too low in biotech settings. Attributing too high a skill level to the IT PHOSITA could unduly reduce disclosure requirements for the specification, allow broad, ambiguous claims, and raise serious notice concerns.

To ensure adequate notice, the level of skill ascribed to the PHOSITA must reflect facts and avoid inappropriate rules of thumb.

Recommendation

The Commission urges courts to direct heightened attention and provide additional guidance regarding assessment of PHOSITA skill levels relative to the problems posed by the art. To serve notice goals, application of the PHOSITA standard should be fact-based, up-to-date, and appropriately tailored to the specific technology at hand.

A second problem derives from the requirement that the specification enable third parties to make or use the invention without “undue” experimentation. From the perspective of competitive impact, time-consuming experimentation is more likely to be undue in settings where product life-cycles are measured in months than where they are measured by decades.

However, the factors traditionally considered in evaluating “undue experimentation” omit this commercial perspective.

Recommendation

Determinations regarding whether a disclosure requires undue experimentation should give recognition to the competitive significance of the time required for experimentation;