



Intellectual Property for Managers and Investors

Steven J. Frank

**A Guide to Evaluating,
Protecting, and Exploiting IP**

CAMBRIDGE

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Preface

It wasn't so long ago that intellectual property (IP) didn't much matter to company managers and investors. Copyright was for writers and artists, trade secrets were difficult to protect, and, as for patents, they seemed at best a necessary expense for large technology companies. Not that IP was exactly ignored; epic patent battles followed the introduction of photography, the telegraph, and television, to name just a few disruptive technologies, while the music and broadcast industries struggled over copyright royalties for most of the twentieth century. But few companies viewed IP as a strategic asset. Particularly in the United States, courts historically detected the foul odor of monopoly when asked to enforce IP rights, and the universe of protectible subject matter was limited – software, for example, lay firmly outside the patent system, while the prospects for biotechnology remained uncertain. Lawsuits involving patents were (and still are) enormously expensive, yet few companies licensed their IP routinely and voluntarily. These circumstances left IP uncertain in scope, difficult to enforce, and unlikely to yield an economic return, absent exhausting and potentially ruinous litigation.

As a result, managers spent little time fretting over IP. Often disinclined to dive too deeply into the details of their companies' technology in any case, many simply delegated, trusting that responsibility would reach the sober hands of engineers, scientists, and lawyers padding about their offices in mismatched socks. And why not? Business success seemed to depend no more on IP than the locks on the doors. What more could be done than defining a reasonably secure perimeter around the company's innovation, keeping competitors a step behind if not at bay?

By the 1980s, forces that would dramatically change this static picture began to converge. Commercial software was starting to infiltrate the mass market. Unlike most goods, software is licensed rather than sold so that the originator can retain the underlying IP rights (in particular copyright, which had recently been extended to cover software). Suddenly licensing became a familiar mechanism for disseminating technology, and the notion of sharing innovation with

total strangers didn't seem so fraught. Certainly it seemed like a good idea to universities, which, thanks to the Bayh-Dole Act of 1980, found themselves able to keep the rights to inventions made with government funding. In order to bring these inventions into the marketplace – an explicit goal of Bayh-Dole – universities began accumulating patents and licensing them to industry.

It also seemed like a good idea to IBM. For decades one of the world's leading patent recipients, IBM began to license its IP to all comers as a way of generating revenue. To those inured to the notion of patents as a defensive wall – even in the computer industry, these were the days of proprietary architectures – IBM's decision to install a tollbooth seemed heretical. By welcoming smaller, nimbler competitors, wouldn't IBM ensure its own eventual irrelevancy?

Years passed and IBM prospered, its licensing revenues growing impressively. Keen observers warmed to the notion of IP as a monetizable commodity. All that remained was for licensing practices to become institutionalized. Here the telecommunications industry led the way. Think of the telephone network: its value to any particular user derives from the number of other people who also use it. Expansion of a network benefits both consumers and the industry players that create its infrastructure, providing a strong motivation toward standardization – the more the network is based on common designs and technical specifications, the more easily new products can be brought into the network. In response to the rapid growth of telecommunications and the increasing need for compatibility across continents (not to mention the imperative of containing the system's increasing complexity), standards-setting organizations began to proliferate. Soon the benefits of standardization became evident to non-network markets such as the computer industry, the semiconductor industry, and even the highly segmented software industry, as familiarity with common features lured customers and encouraged the development of complementary products. (The auto industry, of course, had learned this lesson generations earlier.)

Technical specifications don't grow on trees, however. While some technology developers may be willing to donate their efforts to a standard in order to fuel marketplace acceptance of their products, others seek to profit directly from their labors. Standards-setting organizations, always seeking the very best technologies, have largely accommodated them. Today most such organizations permit for-profit licensing by their contributors.

At the same time IP licensing was proliferating, its value and scope were increasing. In 1980 the US Supreme Court issued its landmark *Chakrabarty* ruling, which announced a policy of interpreting the patent laws broadly. Sanctioning patent coverage for engineered micro-organisms, the court held

that patents could cover “anything under the sun that is made by man.” The introduction two years later of a specialized appeals court for patent cases in the United States further signaled a historic reversal of judicial sentiment against patents, and brought much-needed nationwide uniformity to legal standards. The United States accorded copyright protection to software in 1978, Japan did so in 1985, and a European initiative was approved in 1991 (although some member states had already enacted the necessary legislation). With the emergence of clear protection for biotechnology and software, IP law was keeping pace with the fastest-growing areas of industrial innovation, which, in turn, grew ever more dependent on – and creative with – the vehicles IP law provided. Today few businesses (and, as a consequence, few merger partners, acquirers, and equity investors) can afford to ignore them.

Still, IP often strikes fear into the hearts of those it touches due to its sometimes arcane laws and the technical nature of its subject matter. Rather than fear, they should thrill at the sheer range of options and potential strategies now available. IP can be valued, exploited, and traded – even securitized – outside the context of litigation. No longer is there much question about what can be protected. Consider the number of patents issued annually in the United States, which increased from 66,000 in 1981 to 166,000 in 2001. Such growth reflects not only the surging importance of IP, but also the ever-broadening range of enterprises that rely on it.

The aim of this book is to acquaint managers with basic IP concepts, current strategies for its acquisition and exploitation, and how IP strength can be evaluated meaningfully. The term “managers” is intended in the broadest possible sense – research-group leaders, company founders, investors in technology enterprises, corporate sachems and industry mandarins, all-knowing visionaries of every stripe . . . anyone with decision-making responsibility at the interface where business and innovation meet. Corporate and university research managers need cost-effective programs for developing IP that adhere to a sensible budget, while cultivating enthusiasm and cooperation on the part of innovators. A prospective CEO must be able to distinguish a disastrous IP picture from a promising one, and, if he or she decides to join the organization, to define and pursue a realistic strategy. Before investing in a new portfolio company, a venture investor needs an understanding of management’s approach to IP and how their efforts have, or will, support business objectives.

IP, in short, forms the bones of this book, but its flesh is all business. In a well-run company, as, it is hoped, in this introduction to the subject, the two are inseparable.

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1

Sketching the IP landscape

IP? What's IP?

What's in your head is intellect – the mind, emotions, imagination and creativity, problem-solving ability. “Intellectual property” (IP) establishes rights in intellect made real – writing, art, music, invention. IP rights are bastions of ownership created by law and granted automatically or by government agency or decree. Though intangible, IP is no less real than a bank account or citizenship. But IP rights are creatures of the laws that underpin them. Only those expressions of intellect falling within a favored category receive protection, allowing the owner to prevent unauthorized use. Everything else is unprotectible; it belongs to the public.

Most creative efforts will be eligible for protection within some IP regime. The traditional categories, and the ones with which we will be most concerned, are:

- patents: protect most technologies – useful articles and machines, processes, and compositions of matter, as well as ornamental designs and plants;
- trademarks: protect words, names, symbols, sounds, or colors that distinguish goods and services;
- copyrights: protect works of authorship, such as writings, music, and artworks that have been tangibly expressed, as well as computer software;
- trade secrets: information, such as formulas and manufacturing techniques, that companies keep secret to give them an advantage over their competitors.

It is important to distinguish IP from obligations created by contract, custom, or other law; for example, anything an employee creates in the course of his work may belong to his employer. Some of what he creates may take the form of IP or may be protectible by IP, but the obligation itself stems from the employment relationship and stands outside IP law. It is also important to distinguish the IP right from the fruits of its exploitation. Suppose a battery manufacturer obtains a patent on a long-life battery. A customer buys one.

Do the manufacturer's IP rights end with the sale? Or can it charge the customer additional fees depending on how she uses the battery? The answer, in general, is that IP rights end – are “exhausted” – after the first sale. They do not remain attached to an item, through its life and travels, like an ankle-biting terrier to a pantleg.

Let us consider patents, copyright, and trade secrets in greater detail. These are the IP systems of most immediate interest to technology companies. Because the laws in industrialized countries tend toward similarity more than difference, this book will attempt to avoid excessive focus on the laws of any one place, and instead stick to general principles. Where distinctions matter or if specifics are called for, we will consider the laws of the United States, Europe, and Japan.

Patents

A patent is a government-granted right to stop others from doing certain things specified in the patent document. As such, it is not a monopoly, because it confers no right to actually do anything – just to stop others. Suppose, for example, that you live in an earlier day and your father is the first to invent the automobile. He patents, among other things, the transmission. Grateful for the new mode of transportation, but growing weary of operating the clutch and stickshift as you cruise the boulevards for admiring glances, you invent and patent the *automatic* transmission. Yes, you can stop the old man from making automatic transmissions, you disloyal rascal. But your patent does not give *you* the right to make them, either: if your father's basic transmission patent is broad enough to cover automatic transmissions – that's right, a patent can cover later-developed technology unknown at the time it's filed – his patent “dominates” yours. Neither of you can make automatic transmissions without the other's permission.

Note that the activity, rather than the patents, is the problem here. Patents do not infringe other patents. If no one manufactures automatic transmissions, the patents happily coexist. Only some sort of activity, that is, making, using, or selling something, constitutes infringement.¹ Nor does

¹ Of course, it is possible for the patent office to make a mistake and issue two patents that overlap. In that case coexistence is impossible and the matter must be straightened out. In most countries it is easy – the first to have filed wins as to all subject matter within the scope of his or her patent. In the United States, however, where priority goes to the first to invent rather than the first to file, proceedings in court or before the patent office must be instituted to investigate who invented what first and assign ownership accordingly.

it matter whether that activity was undertaken in ignorance of someone else's patent rights. Independent development is no defense to patent infringement. This is an important distinction between patents and other forms of IP.

Enforceable rights do not arise until the patent "issues" as a formal document. That typically occurs one and a half to three years after the application is filed, depending on the country and the area of technology. In the interim, competitors may freely use the technology, since no IP rights exist yet; the best the applicant can do is declare "patent pending" in the hope of intimidating potential copyists into stealing from someone else. Meanwhile, the patent office examines the application and corresponds with the applicant. Despite this unavoidable period of delay, which can vary widely, the term of a patent is measured from the date the application is first filed. The usual term is 20 years from this date so that, on average, patents offer 16 to 18 years of exclusivity.

Eligibility

A patent applicant must satisfy certain eligibility criteria before his application will even be considered:

- the invention must fall within a statutory category of eligible subject matter;
- pre-filing activity must not have created a legal barrier to patenting.

Although patent laws tend to enumerate specific categories of protectible subject matter, they embrace virtually all technologies.² Sometimes, however, specific islands within this sea of coverage remain off-limits. Europe, for example, tends to take a more limited view than the United States when it comes to patenting computer programs (although the law there continues to develop), animal and plant life forms and their methods of production, and methods of treatment of humans or animals for surgery, therapy, or diagnosis. Medical subject matter can be patented in the United States, but patents cannot be enforced against "medical practitioners" performing "medical activities." In other words, while pharmaceutical products and medical devices are fair game, their use cannot be restricted.

In addition, the sea of patentable subject matter is not without shorelines. In most countries, inventions must have a technical character in order to qualify for patent coverage. That is less true in the United States, however,

² In the United States, "anything under the sun that is made by man" can be patented. Article 2(1) of the Japanese law defines patentable subject matter as "the highly advanced creation of technical ideas utilizing natural laws."

which has recently become far more permissive toward so-called “business methods.” Beginning in 1998, US courts opened the door to patenting of business methods without really defining what they are. The key court decision³ involved a data-processing system for managing financial services, but, because judges set no limits, recent practice has extended patentability well beyond computer-implemented inventions and even beyond any reasonable notion of “business.” Some well-publicized embarrassments – including an unfortunate patent issued for “a method of swinging on a swing”⁴ – have prompted greater discretion on the part of the US Patent and Trademark Office (PTO), but the fact remains that, in the United States, little other than laws of nature and perpetual-motion machines falls outside the reach of the patent system.

Patent laws also limit eligibility to subject matter that is genuinely “new.” While that may seem painfully obvious, the law considers newness from the viewpoint of the public rather than the inventor. Consequently, an inventor’s own activities in selling or calling attention to an invention can preclude her ability to obtain patent protection. The patent system, in other words, is designed as much to safeguard the public as to protect innovation. If the public knows about your invention and you have not sought patent protection, people are entitled to assume you *are not going to seek protection*. Different countries tolerate different amounts of delay. Most, in fact, tolerate essentially none whatsoever. Outside the United States, any sale or public use or disclosure prior to filing a patent application is typically fatal – if you did not file your application before you first sold or publicly divulged your invention, it is already too late. Your application will be denied, or the resulting patent can be overturned if challenged. This rigid rule, obviously, represents a dangerous trap for the unwary.

The United States is more forgiving, allowing applicants a full year to file a patent application following the first public disclosure or *offer to sell* an invention. But note that key difference: the one-year clock starts ticking the moment an invention is held out for sale, so long as it is “ready for patenting” at the time. That does not include licensing, however. An inventor may offer to license an invention without loss of patent rights; but, if the inventor (or his licensee) publicly discloses or commercially exploits the invention itself, he must file within one year.

³ *The State Street Bank and Trust Company v. Signature Financial Group, Inc.*, 149 F.3d 1368, 47 USPQ 2d 1596 (Fed. Cir. 1998).

⁴ Think I’m kidding? See US Patent No. 6,368,227, available at www.uspto.gov. You might also have a look at US Patent No. 5,443,036, which covers a “method of exercising a cat” by wiggling the beam of a laser pointer along the floor so kitty gives chase.

This basic tripwire – one year in the United States, no time at all in “strict novelty” countries – is very easily snagged. “Public” disclosures, for example, need not involve the public at all. A nonconfidential discussion with even a single individual, who both understands the technology and is in a position to disseminate the knowledge, can qualify as a public disclosure or use. The trap can be dodged by avoiding pre-filing sales activities and/or entering into suitable confidentiality agreements. Let us consider some typical circumstances that may give rise to a patent-defeating disclosure or sale:

- *Beta agreements.* Companies generally assume that allowing trial (“beta”) use of their technology prior to commercial sales falls outside the patent laws. In fact, beta arrangements may well catch the disclosure/sale tripwire if: (i) the originator receives compensation, (ii) the beta arrangement too easily leads to a subsequent sale, and/or (iii) it fails to require confidentiality. In the United States, a limited “experimental use” exception can override the presumption of public use even in the absence of explicit confidentiality requirements; experimentation may be inferred if, for example, the beta site furnishes test results to the originator and returns all materials following the evaluation period. But, while experimental use can trump public use, it *will not* avoid the bar stemming from untimely sales.
- *“Black-box” uses.* What if a company exhibits its next-generation product, still under development, at a trade show? Have patent rights been compromised even if nothing was offered for sale? Perhaps not, depending on what was shown. If there has been no “divulcation” of the invention’s operation – for example, viewers merely observe the product’s capabilities rather than how it achieves them – then the way the invention works may still be protectible. The damage to future patent rights is limited to what is actually displayed. But, if the mechanism of operation can be inferred from the results, even a “black-box” demonstration can destroy patent rights. Moreover, sometimes recognition of a problem can itself constitute a patentable invention. At the very least, an inventor who publicly demonstrates a solution will be barred from patenting the *concept* of solving the problem, although she may be able to patent the details of her solution.
- *Presentations to prospective investors.* Few professional investors will enter into a confidentiality agreement (at least prior to offering a term sheet). Is a “pitch” meeting with venture capitalists a public disclosure? Maybe or maybe not, depending on the circumstances, but the risk is very much with the pitcher. *Get on file first!*

In addition to qualifying as patentable subject matter and as new in the disclosure/sale sense, an invention must, of course, be new in the technical

sense. But it must also be *inventive* to merit a patent. When judged against prior efforts, an invention has to be different in a way that makes a difference – reflecting more than, say, a pedestrian design choice (a rivet rather than a screw) or a trifling variation (a pH of 7.1 instead of 7.2). A patentable innovation, in other words, is a meaningful one. Not necessarily profound – just more than a routine variation or alternative.

Rights protected

A patent owner possesses the right to prevent others from making, using, selling, offering for sale, and importing subject matter that infringes the patent. This raises three questions:

(i) *What's infringement?* The terms of a patent are highly specific so that the public can know exactly what does, and does not, come within its ambit. Anything that does, infringes. Anything that does not . . . well, it probably does not infringe, but might do. In many countries, including the United States, Japan, and in Europe, the “doctrine of equivalents” extends patents beyond their literal terms to cover subject matter they do not expressly mention. The doctrine is applied sparingly, lest patent claims lose all meaning; courts tend to resort to it when someone clearly obtains the benefits of an invention by departing only slightly from the terms of the patent. Often a whiff of unfair play (for example, contrived readings of ambiguous patent language or a deviation that seems almost cynical in its triviality) is necessary to stir the doctrine into action.

Infringement can be direct – doing what the patent claim says – or indirect. An indirect infringer either “induces” someone else to infringe (for example, by providing how-to instructions and encouraging the infringing activity) or, as a “contributory” infringer, facilitates the violation by providing some enabling component. But that component – a machine that carries out a patented process, for example, or a critical element of a patented device – somehow must be specialized to what is patented and not a “staple” commodity having non-infringing uses. Indirect infringers face the same legal sanction as direct infringers, but only if there is, in fact, a direct infringer out there – if, in other words, the inducement or contributory efforts succeed. The attempt itself is not enough to trigger liability.

(ii) *What's the remedy?* In general, a patent owner can obtain money damages for past infringement and an injunction – a court order to stop – to prevent

future infringement. Money damages may be based on the patent owner's lost profits or a court's estimation of a reasonable royalty.⁵

Although a patent owner will often consent to continued infringement for the right price, it need not do so. Daft as the decision may be from an economic standpoint, the patent owner usually has the prerogative to preclude anyone or everyone from making his invention. Only in certain cases will he be required to tolerate unwanted use of his IP rights, and even then only for reasonable compensation. In the United States, government funding of the invention's development or an abstract notion of the "public interest" may result in compulsory licensing. Some countries, such as Japan and China, impose a "working" requirement, meaning that, if the patent owner has not commercially exploited the invention within a certain period (typically three years) after grant, others may apply to the government for a license to do so.

(iii) *Where is the patent effective?* Only within the borders of the country that issued the patent. Suppose you have a United States patent covering a revolutionary toilet valve. That means you can stop any infringing activity having a direct nexus to the United States. US manufacture is covered, even if the valves are intended to be sold abroad. Likewise, importation of foreign-made valves as well as their use in the United States are covered. (Remember, though, that even though unauthorized importation and use are separate offenses, the "first sale" doctrine prevents a patent owner from extracting a royalty from the valve's importer and then from the user.)

United States law takes matters a step further when it comes to foreign activity. Suppose someone ships the toilet valve's individual *components* to Canada and has them assembled there for sale. Since the finished valve is never made or sold in the United States, US patent law would seem to have been outwitted. But no. The law expressly covers such efforts at circumvention, deeming them an infringement as if the assembly had occurred in the United States. Similarly, consider a US patent on a process for making cheese. If someone makes the cheese in Canada but sells it in the United States, that is also an infringement, even though the patent only covers the production process and not the cheese itself; once again, the law applies as if the process

⁵ A reasonable royalty is the minimum. Patent owners usually seek lost profits, which can exceed reasonable royalties by a considerable margin. But lost profits are only awarded for profits actually lost, not profits the patentee might have hoped for. To obtain lost profits, the patent owner must prove that there was a demand for the patented product during the period of infringing sales, that there were no acceptable non-infringing substitutes on the market, and that the patent owner had the ability to meet the demand for the products covered by the patent. The patent owner must also provide a detailed computation of the amount of profits it would have obtained had it made the infringer's sales.

had been carried out in the US. More on these exceptions later. For now, think of patents basically as creatures of their home countries. As a result . . .

International rights

. . . applicants seeking protection abroad must apply for patents on a country-by-country basis. The Paris Convention helps make this bearable. A multi-lateral treaty that has been adopted by virtually all industrialized nations, the Convention assists international applicants by obligating every member country to respect for one year the filing date of a patent application in another member country. Let us say you file a patent application in the United States on January 2, 2006. So long as you file counterpart applications in other countries within one year, they will be treated as if filed on January 2, 2006. This means that disclosures or sales following the United States priority filing are fine; they will not undermine non-US rights so long as foreign applications (or a PCT application⁶) are ultimately filed within a year of the priority date (see figure 1.1).

Do not confuse this one-year priority-hold period with the one-year disclosure/sale grace period accorded in the United States. Most every country will respect a priority date for one year; only the United States allows you to *delay* securing a priority date for up to one year after a disclosure or offer for sale. So, if you only care about rights in the United States, go ahead and disclose or sell your invention to your heart's content; just file within a year of when you start. If you want to preserve rights elsewhere, you must file *some-where* before any public disclosures or sales; then you get a year to file foreign counterparts.

Since 1995, United States patent applicants have had another option. A “provisional” patent application is a foot in the door. It need not contain claims or have any particular organization or content. Within a year of the provisional filing date, however, a more complete, garden-variety “non-provisional” patent application must be filed. The one-year priority-hold period for foreign applications also begins at the filing date of the *provisional* application. Accordingly, in addition to filing the US non-provisional, the applicant must also file any non-US counterpart applications by the first anniversary of the provisional filing. Other countries, such as the United Kingdom, also permit filing

⁶ More on Patent Cooperation Treaty (PCT) applications below. For now, think of them as placeholders that allow you to defer filing of foreign counterparts – which can be expensive – for up to an additional 18 or 19 months while preserving the original priority date.

of provisional applications (although they may be called something different), with identical timing requirements for domestic and foreign follow-up.

For priority purposes, a provisional application is no different from a non-provisional. If filed within a year of a public disclosure or offer for sale, the provisional application theoretically preserves United States (but not foreign!) patent rights, according the applicant an additional year before the final US application must be filed. The provisional also triggers the one-year Paris Convention priority hold for foreign applications, so filing before sales or disclosures theoretically preserves non-US rights as well. But the qualifier in both cases is “theoretically.” The reason is that the provisional is only as good as what it describes. Make a later patent claim that is not supported by adequate teaching in the provisional, and you can forget about the provisional’s priority date – both in the United States and abroad.

This is why patent lawyers hate provisionals. Clients often assume they can make do with an inexpensive, stripped-down provisional, and lawyers who advise the fully loaded non-provisional model are just playing salesmen. But, too often provisionals offer a false sense of security. To develop confidence in the sufficiency of any patent application, a patent attorney must learn about the invention, consider possible workarounds, and satisfy herself that the application teaches how to make and use everything the inventor wants to cover. Anything less and the application fails. So, while the patent laws allow you to slap a cover sheet on a Ph.D. thesis or on the PowerPoint presentation you prepared for venture capitalists and call the result a provisional application, it is impossible to know, until the real work of a patent application is done, whether it will stand up.

Still awake? Then prepare yourself for the final international complication: foreign-filing licenses. Some countries, including the United States, China, the Russian Federation, and various European states,⁷ require applicants to obtain a license from the patent office before applying for a patent in any foreign country; this gives the government the chance to consider the national-security implications of the application and, if necessary, issue a secrecy order that may suppress the application indefinitely.⁸ Other countries, including Japan, Canada, and various (different) European states, have no such restrictions. In the United States the requirement depends on the place where invention

⁷ France, Italy, Poland, and the United Kingdom impose restrictions to varying degrees.

⁸ Few patents are the subject of secrecy orders, but the standards by which the occasional order is issued and its longevity can vary widely. A 1958 patent application filed by three US Army chemists for a method of synthesizing the deadly nerve agent VX was understandably suppressed by the US PTO, but less understandably declassified in 1975. It is now publicly available.