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Practical Guidelines for Assessing Patent Quality

SankerIP

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According to a UnitedLex survey, "67% of in-house IP professionals surveyed say grant success rate is a top way to measure the performance of outside counsel". *See* 2024 IP Impact Study: Trends in Benchmarking Value, available at https://unitedlex.com. What could go wrong with that? Having an issued patent is better than not having a patent, right? It really depends. An article published in *Forbes* cites the quote that: "It's a well-known fact that a vast majority of patents are worthless." *See* "In Today's Market, Do Patents Even Matter?" by Stephen Key, published by *Forbes* on November 13, 2017 (and updated December 10, 2021).

A patent conveys property rights, and people like to compare patent rights to real estate rights. A deed specifies the precise "metes and bounds" of real estate and the claims in an issued patent define the "metes and bounds" of the patent rights. But there is at least one substantial difference. For real property, it is generally easy to see the property, and to identify the scope of what is included in the property. On the other hand, patent claims are typically written in a dialect of legalese and technical lingo. Trying to assess patent claims is daunting. This chapter provides some ways to address that daunting task without becoming a patent attorney.

Two Distinct Ways to Measure Patent Quality

Although this chapter focuses on technical analysis to measure patent quality, it is useful to review an alternative quality measure based on evaluating each patent as a business asset. Regardless of technical quality, a business may measure the quality of a patent based on the return on investment (ROI), like other tangible assets. When measuring quality based on ROI, the quote above from the *Forbes* article is likely to be correct – most patents do not generate a meaningful return for the patentee. On the other hand, even a badly drafted patent may generate a good return (e.g., if the patentee is able to negotiate good licensing deals). That is, ROI does not necessarily correlate to technical quality.

Under an ROI analysis for quality, it can also be rational to limit the expense of drafting an application, and even accepting narrow claims to avoid protracted costs for patent prosecution. For companies with a large patent portfolio, the marginal ROI for each additional patent is typically small, so holding down the cost for securing new patents may be the primary focus.

Although ROI and technical quality are not always correlated, there are some important instances where they are correlated. When a patent is involved in litigation, the ROI will depend heavily on technical quality. A large sum of money may be at stake, and lawyers on both sides subject the patent to a high level of scrutiny. Similarly, ROI correlates with technical quality during licensing negotiation when working with an opposing party that is technically sophisticated. And ROI typically correlates with technical quality during investment rounds because many investors are technically savvy. In addition, the technical sophistication of investors and business partners is likely to be increasing as parties utilise AI tools to evaluate patent assets.

The remainder of this chapter identifies practical ways to identify the technical quality of a patent or patent application using simple objective criteria. These criteria can be particularly helpful when working with outside counsel. The criteria are not listed in any particular order, so the order presented does not imply ranking or importance.

Avoid Divided Infringement

"Divided infringement" occurs when patent claims are written in a way that requires two or more independent actors (e.g., two distinct entities to perform all of the steps of a method or two distinct entities to supply all of the elements of a claimed system). If the two or more actors are really independent, it can be difficult or impossible to identify one of them as an "infringer". Rather than address the complications of divided infringement during potential litigation, it is better to draft patent claims that avoid the issue entirely.

Consider the following scenario in the context of AI. In most cases, an AI system is trained using a set of training data, and the trained model is then deployed. End customers use a product or user interface to access the trained model and perform some valuable function. A first approach to patent claims would be to write a single claim that includes both training the AI model and utilising the AI model. But this approach creates divided infringement: the company trains the AI model and the end customers utilise the trained model. The patent claim here would be difficult to enforce because neither a competitor nor a customer of a competitor is a literal infringer. In this scenario, it is better to draft one set of patent claims focused on the AI training, and a separate set of claims focused on the AI utilisation, thereby avoiding divided infringement.

In general, each patent claim can be subdivided into separate claim elements (usually separated by semicolons). Having identified these steps/elements, ask whether a single party will perform all of them.

Measure the Length of Independent Patent Claims

There are two competing goals here. Good claims are long enough to recite the essential inventive elements, without reciting unnecessary elements. If a claim is too long, it will be difficult to prove infringement, but if a claim is too short, it is likely that it can be invalidated in litigation (easier to find prior art that teaches the claimed invention).

A first approach to estimating reasonable claim length is a heuristic based on average claim length for the particular subject matter. For many technology fields like software and AI, a typical length is between ⅓ of a page and ⅔ of a page. There is no perfect number for size, but this heuristic can be a helpful guideline, especially when a claim is very long or very short.

A second approach to estimating appropriate claim length is to subdivide a claim into its steps/elements, and then ask which of those elements are essential to the invention. If the claim includes inessential elements, it will be too easy for an "infringer" to avoid infringement by building a product or process that omits one or more of the inessential elements specified in the claim. Conversely, if there are any essential elements missing from an independent patent claim, it may be easier to invalidate the claim during litigation or in *Inter Partes* Review (IPR).

When are the Words "Each" and "Every" Okay to Use in Claims?

Many patent practitioners impose a complete ban on the words "each" and "every" in patent claims, as well as many other terms that characterise an element as absolute. In general, this is a good rule, because certain terms may create easy workarounds for someone who wants to copy an invention without infringing the claim. For example, if a claim recites performing a specific action "for each element" of a set X, it is possible to avoid infringement by building an alternative method or product where the specific action does not occur for at least one element of the set X.

But this rule itself is not absolute. Consider the example above for performing a certain action for each element of a set X. In many cases, there is some criterion for which elements to perform the action. Therefore, one solution is to identify a subset, and perform the action for each element in the subset. For example:

1. A method of …
   …
   identify a subset *X′* of the set *X*;
   for each element x in *X′*, do …
   …

Alternatively, consider:

1. A method of …
   …
   for each of a plurality of elements in *X*, do …
   …

In this scenario, it can be helpful to specify in dependent claims what the subset can be or how the subset is identified (e.g., "*X*' is a proper subset of *X*", "*X*' consists of a single element", "*X*'= *X*" or "identifying the subset *X*' comprises …").

Therefore, when evaluating the quality of patent claims, look for the terms "each" and "every". Then determine whether the term applies to everything or just some subset.

Can the Inventors Understand the Claims?

Patents are supposed to be written for people to understand, but reality is often far from the readability goal. Regardless of the cause, claims that are unclear will be more difficult to enforce in court and more difficult to negotiate in a deal when working with a technically savvy opposing party.

Because patent claims cover a wide range of technical fields, readability focuses on a hypothetical "Person Having Ordinary Skill In The Art" (PHOSITA). In particular, an inventor for a patent is almost always considered a PHOSITA.

Therefore, when there is access to an inventor or other PHOSITA, it is useful to ask that person what the claims mean. If a PHOSITA cannot understand the claims, it would be unreasonable to expect competitors or a court to have greater clarity. When asking the question, some people will be reluctant to admit that they do not understand the claims, so openness can be critical. It is better to avoid a "the emperor has no clothes" scenario.

How Many Typographical Errors are in the Claims, the Specification and the Figures?

There are at least two reasons to review patents for typographical errors, particularly in the claims. A first reason is that even a small error can have substantial and/or expensive consequences. *See*, e.g., *Novo Indus., L.P. v. Micro Molds Corp.*, 350 F.3d 1348 (Fed. Cir. 2003). In this case, the phrase "a rotatable with" was clearly an error, but it was not clear how to fix it. The small error during prosecution had expensive consequences in litigation.

A second reason to look for typographical errors is that it serves as a proxy for the overall work of the patent attorney. Whereas typographical errors are relatively easy to detect, finding and measuring substantive errors is much more difficult. A business process that leads to a higher number of typographical errors in patent documents (especially in claims) is more likely to involve less attention to substantive detail as well.

What is the Continuation Strategy?

While a patent application is pending, it is possible to file a continuation application with new claims, and the continuation application has the same priority date as the original application. Many countries other than the United States provide for "divisional" applications, which are similar to U.S. continuation applications. Because the claims in a pending application are not fixed, they can be adapted as needed based on changing markets, changing technology and/or a changing set of competitors. That is, a pending application (whether original or a continuation) has additional value due solely to the fact that it is not yet fixed.

In addition to the flexibility of having a pending application, continuation applications form families of patents with several other advantages. First, continuations frequently lead to allowed claims that are broader than the original claims because there is greater knowledge of the relevant prior art. In addition, having a family of patents generally provides broader overall coverage, with claims directed to different aspects of the inventive concepts.

How are the Claim Features Interrelated?

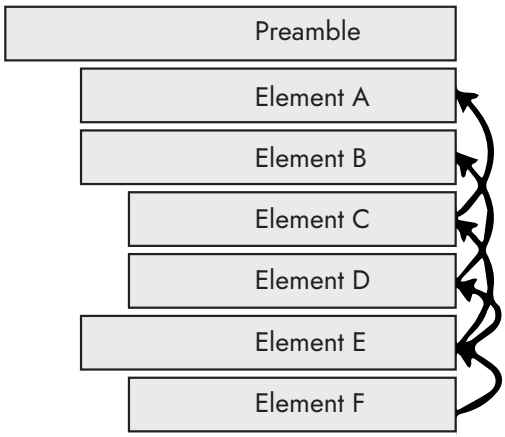
Simply "concatenating" unrelated features is rarely inventive. To illustrate, suppose an "inventor" places five unrelated items on his desktop, and nobody has previously grouped these five

things together (e.g., an orchid, a CD having Beethoven's ninth symphony, a Geiger counter, a tuna-fish sandwich and a 35-pound kettlebell). Regardless of whether this combination has previously existed, it is not inventive because there is no synergy or interaction between the elements.

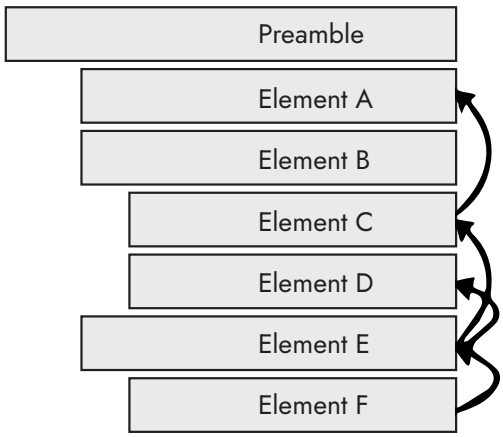
Although a patent application with claims reciting a set of unrelated elements is not inventive, sometimes such patent applications are allowed. Because of the unrelated claim elements, the claims would be more likely to be invalidated in a court or IPR proceeding.

Instead of a set of unrelated claim elements, each claim element should relate to at least one other claim element in a meaningful way. One way to determine interrelatedness is to subdivide a claim into the distinct claim elements, and then draw lines between the elements that are explicitly related according to the claim language. In this context, "related" means more than "is adjacent to". For example, "related" could be "calculated based on" or "performed in response to". In the two illustrations below, a claim has a preamble and six claim elements labelled A–F.

Fully Connected



Not Fully Connected



The arcs on the right indicate the relationships between elements and each arrow points from a claim element to an earlier claim element that it relates to. The graphic that appears first is fully connected because each claim element is related to at least one other claim element. But the second graphic is not fully connected because claim element B is an island. For the second graphic, there are two potential issues: either (i) element B is supposed to be related to one or more other elements, but the appropriate relationship was not captured in the claims; or else (ii) element B really is not related to the other elements. If element B is not related to the other elements, it will be easier to invalidate the claim because a rejection under Section 103 could cite one or more references that teach elements A and C–F, and a separate reference that teaches element B.

When analysing claims for interrelatedness, the relationships should be explicit in the claims. Without explicit relationships, claim interpretation is subject to too much subjective reasoning (e.g., by a court).

Note: The interrelatedness of claim elements depends on the claimed subject matter. For example, when claiming a pharmaceutical compound, "concatenating" different functional organic groups or amino acids can have significant synergistic effects. Minute changes to the placement of portions of a compound can make the difference between a highly effective drug and a compound that has no known use.

How Much Support is in the Specification and Figures?

Patent claims are construed in light of the disclosure, so it is useful to look at the specification and figures. Without proper support, claims are likely to be found invalid under Section 112 (lack of enablement or lack of written description) and/or invalid under Sections 101, 102 or 103.

Support (or the lack thereof) can appear in many forms, so the listing below is inherently incomplete. Some issues to look for are:

a) The number of pages in the specification and figures

Although size does not guarantee adequate support, it is a useful first step. Also, appropriate size varies depending on the subject matter of an invention, so the best comparison is to other patents in the same field. Within software, hardware and AI technology, it would be unusual to have fewer than 15 pages for the specification or fewer than five pages of drawings.

b) The general content of the figures

A good set of figures usually includes a variety of different types. A figure that consists solely of boxes with words and lines between the boxes often does not convey an idea better than just including the words as prose in the specification. Software functionality usually includes branching and looping, so these concepts should be illustrated. Also, beware of figures that have no reference characters; the reference characters should be there to identify relevant functional elements in most cases. In addition, a good patent application typically includes at least one main figure that conceptually illustrates the method or apparatus. Such a figure can be very valuable when working with an examiner or a court to describe an invention at a high level. Creating such a figure also forces a patent attorney to understand the invention better.

c) Look out for filler and/or boilerplate language in the specification

Filler consists of words that take up space without providing any substantive details of the invention. For example, a

software-based invention may include a page listing every possible type or brand of CPU or GPU that may be used, every type or brand of memory that may be used, every operating system that may be used, every network protocol that may be used, and so on. Less filler is better.

"Boilerplate" language commonly evolves over time when a company files a sequence of related patent applications. The boilerplate language can provide useful background information, which saves time and expense. As the boilerplate language evolves, it can also improve accuracy, because it is not being written from scratch each time.

Although boilerplate language can use useful, it sometimes masks the fact that an application has limited substantive detail about the intended invention. When evaluating the quality of a patent or patent application, it is better to focus on the actual invention, ignoring any boilerplate language.

d) Look out for automated translations

Compared to many other countries, the cost of patent prosecution in the United States is high. To reduce costs, some foreign filers draft and file a patent application initially in another country in a language other than English. The application is then translated into English, commonly using an automated translation tool. In many cases, it is easy to recognise such applications because of bizarre or unintelligible language, especially for technical lingo unique to a specific field.

Although automated translation may save some money initially, it can lead to a variety of issues, including lack of enablement or lack of written description. In addition, poor choice of wording can lead to incorrect patent scope or undesirable claim constructions by a court. Furthermore, a perfectly good description in one language may have no simple literal translation into English. If translation is required, paying a professional technical translator will generally lead to better quality.

Is That "Wherein" Really Necessary?

First, kudos to Bryan Garner, who is considered by many to be the top legal writer in the United States. His books include *Legal Writing in Plain English*, which points out many ways to improve legal writing by replacing legalese with simple and plain English words. (And apologies to Mr. Garner for any portions of this chapter that fail his guidelines.) With that in mind, omitting legalese (including "wherein") from a specification typically creates a more readable patent document.

Patent claims are a legal construct where a limited amount of legalese is required, including the word "wherein". However, minimising the use of "wherein" typically leads to better claims. Patent practitioners may have noticed that the word "wherein" invites an examiner (or a court) to split a claim element into pieces, with a first piece before "wherein" and a second piece after "wherein". By splitting a single claim element into multiple pieces, it is easier for an examiner or a court to combine multiple prior art references to allegedly teach the claim element.

For example, consider the claim element "an elongated element, wherein the elongated element is connected to a hinge joint". In this instance, removing the "wherein" creates the simpler claim element "an elongated element connected to a hinge joint".

In general, review a claim for all instances of "wherein" and ask whether each "wherein" is necessary.

Like other measures of quality, use of the word "wherein" also serves as a proxy for attention to detail when drafting patent claims. That is, claims that limit the use of "wherein" are likely to have higher quality in other ways as well.

Are the Claims Ready for Litigation?

Because few patents end up in litigation, it is common to consider the "end game" of patent prosecution to be getting an issued patent. But companies that have been involved in patent litigation recognise that getting an issued patent is just the beginning. The harder part is enforcing patent rights in court. Therefore, good claim drafting entails writing claims with litigation in mind. A litigation mindset includes at least three issues:

(i) it needs to be easy to identify infringers and prove infringement;
(ii) the claim language needs to be clear enough so that a court construes the claim terms appropriately; and
(iii) the claims need to be robust enough to withstand invalidity challenges under Sections 101, 102, 103 and 112.

The quality metrics above address these issues, either directly or indirectly.

For item (i), an important question is whether there is sufficient publicly available information about competitors to establish each of the claim elements. If a competitor's functionality is hidden on a server, litigation could require expensive discovery.

For items (ii) and (iii), use the quality metrics above. When in doubt, consult a patent attorney, preferably one with experience in both patent prosecution and patent litigation.

David V. Sanker's path to becoming a patent attorney was atypical, but each step enabled the next one. He earned his Ph.D. in Mathematics from UC Berkeley in 1989 and then spent three years as an associate professor of mathematics and 12 years in production software development before law school. His experience as a software engineer was also unusual, as he took on several roles in addition to writing the actual programs: creating detailed technical requirements; quality testing the software; providing technical support to users; and designing and implementing an SQL database schema with nearly 500 highly interrelated tables.

David's career as a patent attorney began after he returned to Berkeley for a degree in law, graduating in 2007. An associate and partner at Morgan Lewis for almost 20 years, David began in patent litigation, representing clients at the US Trade Commission, the US Federal Court and in federal district courts. He moved on to patent prosecution in a wide variety of technology areas, including software, AI, cybersecurity, semiconductor devices, database architecture, data visualisation, medical devices, artificial reality, virtual reality and identify verification. Being a patent litigator for five years turned out to be useful: when you see firsthand how patent claims are torn apart in litigation, you learn how to draft better patent claims.

In February 2024, David founded SankerIP, specialising in intellectual property and AI, and backed by an experienced team. David works with client companies, inventors, the US Patent Office and associates throughout the world to build strong IP portfolios, informed by his years of real experience as a software developer, database architect and mathematician. David is also a thought leader in AI. In the past six years, he has frequently written and spoken publicly on the use of AI and how AI influences IP protection. In May 2023 and July 2024, he was asked to speak before the US Patent Office on the topic of AI.

An odd fun fact about David is that he was a world record holder when he was 14 years old. He memorised π to 10,000 digits, doubling the world record from a year earlier.

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