
INTRODUCTION

Almost every patent matter—whether involving procuring a patent, licensing the patent, or enforcing it in court—brings up the same fundamental question:

What Is the Invention?

The question is simple, but deceptively so, because the answer is sometimes maddeningly elusive. Yet the skill with which the answer is pursued is crucial to maximizing a patent’s economic value. A skillfully discerned answer to *What Is the Invention?* results in patent claims that secure protection far beyond the inventor’s specific prototype, or “embodiment,” to ideally encompass all alternative designs that incorporate the essence of what was invented. By the same token, an incomplete or wrong answer may create loopholes in the patent that allow competitors to incorporate the essence of the inventor’s teachings in their own products without infringing the patent.

The difficulty in answering *What Is the Invention?* arises in part because from the patent perspective an invention is not a physical thing but a concept. Even the inventor may not appreciate what that concept is. Scientists and engineers are typically focused on getting some product designed and built, or a material formulated and tested, and getting the thing to market. Abstract notions like “inventive concept” are largely irrelevant to someone charged with working out the bugs, finishing the project on time, and meeting a budget. The task of identifying the inventive concept—answering *What Is the Invention?*—falls mostly to the patent attorney.

This book shows how to capture the inventive concept in the form of a problem-solution statement. This is a sentence of the form:

The problem(s) of _____ is(are) solved by _____.

Here, for example, is a problem-solution statement defining the seminal invention patented by rocket pioneer Robert Goddard.¹ The inventive

1. United States Patent No. 1,103,503 (issued Jul. 14, 1914).

concept is Goddard's recognition that a rocket could be made to travel further for a given amount of fuel by storing the fuel in a casing separate from the combustion chamber and feeding the fuel into the combustion chamber as needed.

The *problem of* enabling a rocket to carry a large amount of combustible material while keeping the weight of the rocket as low as possible is solved by successively feeding portions of the material to the rocket's combustion chamber from a separate casing containing the supply of combustible material.

The book then shows how the problem-solution statement can be used as the basis for drafting the patent application's broadest claims. Indeed, an overarching theme of the book is the critical importance of first analyzing an invention from the problem-solution perspective and only then drafting the patent application's claims based on the results of the analysis. For example, the above problem-solution statement for Goddard's invention is readily transformed into the following claim:

A rocket apparatus having, in combination, a combustion chamber, a casing containing a supply of combustible material, and means for successively feeding portions of said material to said combustion chamber.

Indeed, virtually every topic in this book—from identifying the invention and its fallback features; to drafting claims of varying scope that define the invention and its features; to preparing the specification; to amending the claims during prosecution—is directly or indirectly informed by the problem-solution paradigm.

Summary of the Book

This book is presented in four parts.

Part I—Identifying the Invention

We see in Part I how to identify the inventive concept and how to develop a problem-solution statement as broad as the prior art will allow. Also presented is the use of the problem-solution paradigm to identify the invention's fallback features—features of the inventor's embodiment(s) that can serve as the basis for patentability if prior art that comes to light after the patent application is filed reveals that the invention is narrower

than originally thought. The fallback features inform the patent application's intermediate- and narrow-scope claims developed pursuant to what the book calls the Planned Retreat.

Part II—Drafting Individual Claims

Having identified the invention and its fallback features, we are ready to draft claims that define them. Part II presents two basic techniques for drafting claims to the broad invention, both based on the problem-solution statement. The first of these is problem-solution-based claiming. Here a claim is derived directly from the problem-solution statement, with very little being added or taken away. The second technique is inventive-departure-based claiming. This approach also relies heavily on the problem-solution thought process, but is more open-ended. The claim drafter is set free to bring creativity to bear, allowing a wide range of claim structures and ways of expressing the broad invention. Part II also presents various types of intermediate- and narrow-scope claims, including claims in dependent and independent form. These include claims directed to the fallback features, claim differentiation claims, independent embodiment claims, and maximized royalty base claims. Such claims implement the Planned Retreat, and they serve other functions as well. Definition claims, which function to define terminology used in their parent claims, are also presented. We then look at how best to arrange dependent claims within a given claim family. Finally, we present a law-focused discussion of functional language in claims, generally, and means-plus-function claiming in particular.

Part III—The Claim Suite and the Anticipated Enforcement Scenario

It is not enough to be able to draft claims in isolation. The patent application's overall claim suite needs to be assembled with the anticipated enforcement scenario in mind. Even in the hands of a skilled attorney, the patenting process is fraught with uncertainties. Prior art that lies undiscovered until after the patent issues may render some or all of the patent's claims invalid. Changes in the direction of technology may render some or all of the claims irrelevant to the marketplace.

Part III shows how to assemble an overall claim suite in a way that anticipates and addresses those uncertainties. We see, for example, that the claim suite should include claims defining the invention in all of its commercially significant settings. A video encoding invention, for instance, should be claimed in both the encoder setting and the decoder setting. Most, if not all, of the claims should capture the activities of

individual (as opposed to co-acting) direct infringers. The invention should be claimed in all the appropriate statutory classes, which often means both as a method and as an apparatus. The claim suite should also have as much diversity as possible. This means that the invention is defined using, for example, different claim formats and varying terminology or with the claim elements presented in a different order. Diversity in the claim suite addresses the possibility that any one claim may contain an unappreciated infringement loophole, or may be declared invalid based on prior art or indefiniteness, while another claim may not.

Part IV—Preparing and Prosecuting the Patent Application

The problem-solution paradigm informs not only the preparation of claims but the drafting of the specification and prosecuting of the application in the Patent and Trademark Office. We see in Part IV how the problem-solution statement can serve as the backbone of an effective, story-telling patent specification. It describes how the problem-solution paradigm can be used to amend claims in the most effective way. Part IV also discusses how practitioners can make best use of their most important information resource—the inventor.

Invention Examples

Patent attorneys like to make up technology to illustrate patent law principles. The author recalls, for example, Professor Irving Kayton using the “discovery” that ketchup applied to a bald head can promote hair growth to illustrate the point that one can patent a new use for an old substance.

In that spirit, the author has taken the liberty of making up a few things here and there. The inventions are real—among them the chair, paper clip, microwave oven turntable, traffic signal, and backspace key. Some of the examples, however, make possibly incorrect assumptions about what the prior art was when those inventions were made. That lack of historical accuracy is hopefully compensated for by the pedagogical value of the examples.

Terminology Conventions

The book uses the following terminological and typographic conventions:

Attorney	The word “attorney” is used herein to refer to both patent attorneys and patent agents.
Competitors	Others who may practice an invention are referred to as the patent owner’s “competitors” even though

	the patent owner may not have any intention or ability to practice the invention himself and, if so, does not have competitors.
Inventor	An invention is often made by two or more “joint” inventors. For simplicity, this book always uses the singular form.
Embodiment	Although the inventor often devises multiple embodiments, the book often uses the singular form.
His/Her	Feminine pronouns are used when referring to the inventor and masculine pronouns for patent attorneys and other <i>dramatis personae</i> .
Specification	For readability, initial capital letters are used when Sections referring to the main sections of the patent specification, e.g., Background, Summary of the Invention (“Summary”), and Detailed Description.
Claim numbers	Claim numbers in patents are sequential integers, but for ease of reference, claims are denoted 1.1, 1.2, . . . in Chapter One, 2.1, 2.2, . . . in Chapter Two and so forth.

Reading and Using This Book

This book can be read and used as a reference work. The various sections are fairly self-contained, and liberal cross-referencing enables the reader interested in a particular topic to come on board with any terminology or concepts that might have been introduced earlier.

The book was also designed with another use in mind. Much effort was invested in producing a work that both the new and experienced practitioner could—and would want to—pick up and read from start to finish. The topics build on one another in a logical sequence and with as much of a narrative arc as was possible to provide in a book of this type. The book endeavors not to be simply a compilation of information, but to mentor the reader in an overall approach to analyzing inventions, to discovering the inventive concept and its features, and to then define them in a comprehensive and sophisticated set of claims.

Beyond the claims, the principles presented in this book enable the patent practitioner to prepare a pedagogically satisfying patent specification. Armed with a fully thought-out answer to the question *What Is the Invention?*, the practitioner finds that the narrative flow takes on a certain single-mindedness as the writing proceeds and a convincing invention story emerges. It is easier to get everything down in the right sequence

and at the right level of detail. It becomes clear what is to be put in and what is to be left out. Less editing and rearranging will be required. The claims will almost write themselves. The overall task becomes pleasurable and satisfying, giving the attorney impetus to work in a concentrated, productive fashion.

Most importantly, the principles presented in this book enable the practitioner to produce a superior product.

For the inventor, that superior product is a patent specification that tells a convincing invention story and effectively showcases the inventor's contribution to the art. For the patent owner, it is a claim suite that broadly and precisely answers the question *What Is the Invention?* and thereby maximizes the economic value of the issued patent.

And for the patent attorney, it is a legal task whose completion produces those feelings of well-being and satisfaction that come from a job well done.

Introduction to the Second Edition

The patent law has evolved significantly since the first edition of this book appeared in 2007. Congress passed the America Invents Act in 2011; the U.S. Supreme Court rendered its opinions in *Mayo v. Prometheus* in 2012² and *Bilski v. Kappos*³ in 2010 (clarifying the boundaries of statutory subject matter) and *KSR v. Teleflex*⁴ in 2007 (interpreting 35 U.S.C. 103); and the Federal Circuit issued a significant number of decisions on a wide range of topics.

However, the principles of invention analysis that inform the major portions of the book are timeless and thus little affected by changes in the patent law. *What Is the Invention?* is, first and foremost, a *technological* question. Even those court rulings that affected claiming practices⁵ were of relatively minor consequence in the overall context of the book.

Why then a second edition?

Functional Language in Claims—Means-Plus-Function and Otherwise

Sometime after the first edition went to press, the author realized that an important topic had not been covered—functional language in claims.

2. *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 565 U.S. ____ (2012).

3. *Bilski v. Kappos*, 130 S. Ct. 3218, 561 U.S. ____ (2010).

4. *KSR v. Teleflex*, 550 U.S. 398 (2007).

5. *In re Nuijten*, 500 F.3d 1346, 84 USPQ2d 1495 (Fed. Cir. 2007) (propagated signal claims are nonstatutory); *Abbott Labs. v. Sandoz Inc.*, 566 F.3d 1282, 90 USPQ2d 1769 (Fed. Cir. 2009) (en banc in part) (product-by-process claims only infringed if the alleged infringing product was made by the recited process).

This oversight has now been corrected by way of a new chapter—Chapter Twelve—directed to this topic.

It was also only after the first edition was published that the author was finally disabused of his wishful notion that, “any day now,” the Supreme Court or the U.S. Congress would straighten out the means-plus-function mess that has beset our jurisprudence. The liberal use of means-plus-function examples in the first edition erroneously implied that all was hunky-dory in that corner of our practice. The author’s belated attention to this topic can only be chalked up to a complacency born of some 35-plus years of uneventful means-plus-function claiming and a *Who-Moved-My-Cheese?*⁶ mentality. In any event, the book’s means-plus-function claims have now been re-cast and/or supplemented by non-means-plus-function versions. And a new chapter directed to means-plus-function claiming has been added. That chapter—Chapter Thirteen—addresses the history and current status of means-plus-function claiming and offers some practical guidance for defining claim elements functionally while avoiding what the Federal Circuit refers to as “means-plus-function treatment.”

Chapter Review Questions and Exercises

In preparing the first edition, the author envisioned the book’s principal audience as practitioners already admitted to USPTO practice.

There were two surprises on this front.

Given the book’s hands-on nature, the author had not expected that that book would find much, if any, use in law schools. It turns out, however, that about a dozen law schools offering claim drafting courses or advanced patent seminars have incorporated the book into their curricula. This second edition has thus been supplemented at the end of each chapter with a Chapter Review section that those teaching from this book—as well as those studying on their own—may find helpful. The chapter review items include: questions readily answered based on material in the chapter (Confirm Your Understanding); questions that call for analysis, synthesis or that solicit reader opinion (Questions for Further Thought); and hands-on invention analysis and claim drafting exercises (Sharpen Your Skills). An answer guide is available to law professors at no charge. Contact the author at 212.246.4546 or rdslusky@gmail.com.

The other surprise on the readership front was the extent to which the book was sought out by inventors planning to use the book in the course of preparing and filing their own patent applications. This

6. Spencer Johnson’s book *Who Moved My Cheese?* (Putnam, 2002) is a parable about attitudes toward change.

book can certainly help inventors become better-educated consumers of patent attorney/agent services. However, doing it yourself is a big mistake. Not even a whole shelf-full of books can substitute for the mentoring and experience required to learn how to prepare an adequate specification, properly analyze the invention, and draft appropriate claims. (The author is reminded of the supposedly humorous book cover from his junior-high-school days: *Brain Surgery Self-Taught* by Lance Boyle, M.D.). Write a patent application and its claims yourself, if you are so inclined, but then take it to a patent professional.

Revisions to the Text

One of the book's prescriptions is *Consult with Colleagues*.⁷ This is a complex practice and it is easy to miss something or go off in a bad direction. As a colleague of the author once observed, "If this was easy everybody would be doing it." Indeed, the author had the privilege of consulting with many colleagues since the book's introduction, particularly while presenting the book's material in public and in-house seminars. In addition to questioning the author's over-fondness for means-plus-function claiming, some of the more experienced seminar participants offered insights that resulted in changes throughout the book. Among those were a re-vamping of the claims for the microwave oven turntable example that appears in several places and the Planned Retreat for the invention of the chair appearing in Chapter Six.

Other revisions reflect changes in the law relating to propagated signals and product-by-process claims.⁸ Case law citations have been updated to reference the most recent cases on point, and Appendix D has been revised in light of statutory changes embodied in the America Invents Act of 2011.

This edition also features an expanded the index.

Statutory References—America Invents Act

The America Invents Act (AIA), enacted in 2011, amended a number of sections of Title 35 including §§ 102, 103, and 112 cited throughout this book. Those amendments will become effective up to a year after this second edition has issued. However, the AIA's new sub-sectioning scheme has been incorporated into the text in order to make the book as useful as possible for the long term. Thus, for example, the various provisions of § 112 currently denoted by paragraph number are referenced herein by their AIA designations—§ 112(a)–(f).

7. p. 45.

8. See note 5.