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## CHAPTER ONE

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# Inventions Are Concepts

For most people, an invention is something tangible. One thinks of mechanical devices like the zipper or manufactured substances like tetracycline. Even a process invention like pasteurization evokes the physical reality of the milk being heated.

For patent lawyers, however, an invention is not something physical, but a concept. Indeed, in his 1933 book *Double Patenting*, patent law author Emerson Stringham goes so far as to state that an invention is an abstraction:

The difficulty which American courts . . . have had . . . goes back to the primitive thought that an “invention” upon which the patent gives protection is something tangible. The physical embodiment or disclosure, which, in itself is something tangible is confused with the definition or claim to the inventive novelty, and this definition or claim or monopoly, also sometimes called “invention” in one of that word’s meanings is not something tangible, but is an abstraction. *Definitions are always abstractions.* This primitive confusion of “invention” in the sense of physical embodiment with “invention” in the sense of definition of the patentable amount of novelty, survives to the present day, not only in the courts, but among some of the examiners in the Patent Office [*emphasis added*].<sup>1</sup>

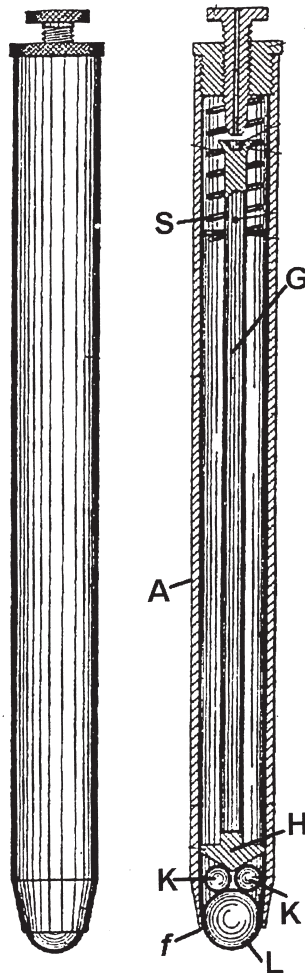
There is no possibility of clear thinking, says Stringham, until it is understood that an invention as protected by a patent is an abstraction.

Patent practitioners refer to that abstraction as the “inventive concept.”

The patent attorney’s primary mission is to discover the inventive concept underlying the inventor’s embodiment, and then to capture the inventive concept in the patent claims. To fail in that mission is to open the door for a competitor to take advantage of the inventor’s contribution to the art while avoiding liability under the patent.

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1. Emerson Stringham, *Double Patenting* (Washington, D.C.: Pacot Publications, 1933).



**FIGURE 1-1** John Loud's ballpoint pen.

This chapter uses John Loud's invention of the ballpoint pen, patented in 1888,<sup>2</sup> to illustrate the idea of inventive concept. Loud's embodiment is shown in Figure 1-1.<sup>3</sup> The ball *L* is held against the contracted mouth *f* of tube *A* by spring *S*, which pushes against rod *G*, bearing *H*, and anti-friction balls *K*. The spring yields when the ball is pressed against paper, thereby regulating the flow of ink onto the ball and from there onto the paper as the pen is moved.

Claim 1.1 defines Loud's pen:

2. U.S. Patent No. 392,046 (issued Oct. 30, 1888).

3. Loud's embodiment was not practical. A Hungarian journalist named Laszlo Biro is credited with having invented the modern ballpoint pen in 1938.

1.1 A pen comprising  
a tube having a contracted mouth and adapted to hold ink,  
a spheroidal marking point projecting from the mouth, and  
an ink flow regulator<sup>4</sup> that resiliently holds the marking point  
against the mouth.

This claim seems pared down to the absolute minimum. Desirably, the claim even reads on the pen empty of ink since the claim calls for a tube adapted to hold ink, but it does not recite the ink as an element of the claimed combination. As such, the claim reads on pens in their manufactured form and could be asserted against manufacturers who might have sold the pen without ink, like fountain pens of the day.

Yet claim 1.1 would be of little value if Loud's patent were still in force. Modern ballpoint pens do not have anything like Loud's "ink flow regulator that resiliently holds the marking point against the mouth." Instead, the ink is kept from leaking out by virtue of a tight fit between the ball and its socket and by using ink that has just the right level of viscosity.

Granted, it would have required a visionary of considerable insight to have anticipated the advent of the technology required to manufacture today's modern ballpoint pens. However, it does not require a visionary to recognize that advances do occur. Indeed, the patent attorney's task is to draft claims that preserve a patent's value *despite* such advances if improved devices embody the inventor's original work.

Loud's attorney, William Dowss, was in fact up to the task. Claim 1.1 and its "ink flow regulator" is not Dowss's claim, but was written for this example by the author. If the Loud patent were still in force, Dowss's claims would command a royalty for every ballpoint pen on the market because Dowss successfully isolated—in a 10-word claim—the concept that underlies every ballpoint pen:

1.2 A pen having a spheroidal marking-point, substantially as described.

That's it! A pen having a spheroidal marking-point. A pen cannot be a ballpoint pen without one. Another claim in the Loud patent is similarly terse.

1.3 A pen having a marking sphere capable of revolving in all directions, substantially as and for the purposes described.

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4. A means-plus-function version of this element might be "means for resiliently holding the marking point against the mouth." The means-plus-function construct is used only sparingly throughout the book, for reasons made apparent in Chapter Thirteen.

There are myriad different ballpoint pens on the market. Yet each implements the concept that Loud was the first to embody in a pen and that Dowss was skilled enough to claim. Loud's embodiment did not have a replaceable cartridge, a plastic barrel, or a retractable tip. The technology needed to create the tiny balls and tight-fitting sockets used in modern fine-line ballpoint pens probably did not exist in 1888. Today's metals, plastics, and ink compositions were not available. Nonetheless, every ballpoint pen produced since Loud's original embodies a concept that transcends these embodiment details—the concept of a pen “having a spheroidal marking-point.”

It is easy enough now to recognize the shortcomings of claim 1.1. But how would one know that it is not the broadest definition of the invention? It is the rare invention that can be claimed in as few words as claims 1.2 and 1.3, and therefore a claim even as short as claim 1.1 would seem to be quite broad. How did patent attorney Dowss have the insight to foresee in 1888 that future pens would not need claim 1.1's spring-loaded “ink flow regulator”?

Dowss may not have had that insight. But Dowss's claims clearly evince his understanding that implementational details—like an “ink flow regulator” or a tube with a contracted mouth—were irrelevant to the essence of Loud's invention.

How did Dowss come to that understanding? And how can the practicing patent attorney today know when the inventive concept has truly been found and properly claimed?

The answer to that question is an approach to invention analysis that lies at the heart of this book.

### **Begin from the Problem**

The path to the inventive concept begins with the problem that the inventor solved. The inventive concept is the inventor's solution to that problem, when broadly articulated at a conceptual level. Given any detail in the inventor's embodiment—a physical element, a method step, a particular functionality, or a specific relationship among these—one can ask whether that detail is essential to solving the problem at least to some extent. If not, that detail is not intrinsic to the inventive concept.

The problem Loud addressed was that existing (fountain and quill) pens could not write on rough surfaces, such as wood or leather. Central to his solution is the ball itself. Problem solved. Claim 1.1's “ink flow regulator” tells how such a pen could be constructed, not about how the problem of writing on rough surfaces can be solved. If the ink could somehow regulate itself, we would still have a pen of the type Loud envisioned. Never mind that Loud probably never considered whether

such an ink could exist. It is possible to formulate a statement of something new—a pen with a spheroidal marking-point—without having to describe how such a pen might be constructed.

Perhaps somewhat more subtle is the question of the contracted mouth of the pen barrel, which one might think is absolutely required. How else could the ball be held in place?

It doesn't matter.

Imagine a tiny genie whose job is to hold the ball in place. Loud's spheroidal marking-point pen would still be a novel writing implement, even with that genie hanging on for dear life as the pen wiggles across the paper. Distinguishing Loud's pen from those that came before does not require saying that the pen has a contracted mouth or an ink flow regulator. Advantageous or not, these are only implementational details not going to the essence of solving the problem of writing on rough surfaces.

Dreaming up what the book calls "far-fetched embodiments," like our genie, is a powerful invention analysis tool.<sup>5</sup>

It is sometimes thought there is no harm in including an implementational detail in an invention definition if the detail is absolutely needed to implement the invention. This is a dangerous view to take. We can never be certain that any particular detail always *will* be needed. Technology marches on. New ways of doing things are invented every day.

Moreover, whether something seems required to *implement* an inventive concept is irrelevant to the task of *claiming* it. No argument in this regard comes from the Patent Office of 1888. The Patent Office issued Loud's patent with claims 1.2 and 1.3 just as presented above. Indeed, upon eliminating the "substantially as described" construct not used in modern practice, and assuming that ballpoint pens had not yet been invented, those same claims would be patentable today.

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Inventive concepts underlie every kind of invention, not just mechanical devices like ballpoint pens. Appendix A presents a number of them, including such pioneering inventions as Birdseye's method for packaging frozen food, Camras's technique for magnetic recording, and L'Esperance's laser vision surgery.

It is no surprise that such breakthrough inventions can be articulated broadly and claimed tersely. But week in and week out the Patent and Trademark Office issues patents with similarly broad claims that are directed to more modest advances. Appendix A provides examples of these as well.

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5. See p. 39.

## CHAPTER REVIEW—Inventions Are Concepts

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### Confirm Your Understanding

1. Why is it important for a patent's claims to capture the invention's underlying concept?
2. What is the harm in including a claim limitation that any practical embodiment is going to have to have anyway?

### Questions for Further Thought

3. How is it possible to reconcile the idea of claiming the inventive concept with the principle that abstract ideas are not the proper subject of a patent claim? See, generally, *Diamond v. Diehr*, 450 U.S. 175, 209 USPQ 1 (1981); *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*, 149 F.3d 1368, 47 USPQ2d 1596 (Fed. Cir. 1998).
4. None of Loud's ballpoint pen claims (p. 6) encompass the felt-tip pen. Assuming that a claim could be drafted that would cover both ballpoint and felt-tip pens, while not reading on the prior art fountain pens and quills, do you think Loud should have been entitled to such a claim?
5. Do you agree with the author's contention that claims 1.2 and 1.3 would be patentable today, assuming no ballpoint pen prior art existed? Why or why not?
6. How would you respond if an examiner were to reject claims 1.2 and 1.3 based on
  - a. 35 U.S.C. 101 as not being directed to an inventive "manufacture" but only a concept?
  - b. 35 U.S.C. 112(b) as being "vague and indefinite"?

### Sharpen Your Skills

7. Identify the problem solved and inventive concept(s) underlying the inventions listed below, based on the prior art indicated.

Invention	Prior Art	Problem Solved	Inventive Concept
Ballpoint pen	Quills; fountain pens	Pen can't write on rough surfaces	Pen with a spheroidal marking-point
Bubble wrap	Shredded paper; packing peanuts	?	?
Pocket door	Hinged door	?	?
Computer spreadsheet	Pencil and paper; word processing	?	?