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The Myth of Well-Settled Rules in *Merrill v. Yeomans*

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THE MYTH OF WELL-SETTLED RULES IN *MERRILL V. YEOMANS*

John F. Duffy[†]

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INTRODUCTION

The Supreme Court’s decision in *Merrill v. Yeomans*¹ is widely and correctly viewed as a watershed case in which the Court first announced that the “distinct and formal claim” has “primary importance” in determining “precisely what it is that is patented.”² But the reasoning of the case relied on a pernicious myth that the patent system of the era contained such “well-settled rules” as to “leave no excuse for ambiguous language or vague descriptions” in textual descriptions of inventions.³ *Merrill*’s myth has had unfortunate consequences, with courts occasionally placing unrealistic demands upon inventors—and, really, inventors’ attorneys—to write claims with a degree of clarity that is often impossible given the technological and legal knowledge at the time of patenting.

Merrill was an early Supreme Court patent decision in which the outcome turned on a proper construction of the language in a patent claim, which was then a relatively new legal innovation for demarcating intellectual property rights that had been required by statute for less than a half century.⁴ The claim asserted by the patentee may have been

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1. 94 US. 568 (1877).

2. *Id.* at 570.

3. *Id.* at 573.

4. *Id.* at 569; *see also* Patent Act of 1836, ch. 357, § 15, 5 Stat. 117, 123 (1836).

inartfully drafted (though more on that later), and patentee argued that the Court should give the claim “a liberal construction” that might counterbalance the deficiencies in its drafting.⁵ The Court refused to do so, and as one reason, it expressly relied on the progress achieved in patent law in prior years.⁶

“The growth of the patent system in the last quarter of a century in this country has reached a stage in its progress where,” the Court believed, “[i]t is no longer a scarcely recognized principle, struggling for a foothold, but it is an organized system, with well-settled rules, supporting itself at once by its utility, and by the wealth which it creates and commands.”⁷ That “developed and improved condition of the patent law” left “no excuse for ambiguous language or vague descriptions” in patents.⁸ The Court believed that the “progress” in, and “improved condition of,” patent law and its “well-settled rules” justified, the limiting construction that it gave to the patentee’s claim.⁹

This essay reexamines the claim of “progress” and “well-settled rules” in patent law and advances three points. First, at a basic level, the *Merrill* Court was clearly correct that the law in general does exhibit progress, and in patent law, that progress has been particularly rapid in the last two centuries. Patent claims are but one example. Two hundred years ago, patent claims were optional curiosity—a recent innovation of patentees’ attorneys who were seeking to define their clients’ rights broadly, beyond the particulars of the inventive embodiments disclosed in the drawings and descriptions of the rest of the patent document. Today, claims are a requirement of patent documents worldwide, and they serve an important role in defining the scope of the intellectual property rights granted by a patent. The practice of claim writing is now sufficiently developed that identical or nearly identical claims help demarcate rights across multiple countries.¹⁰

Second, the *Merrill* Court was clearly wrong to the extent it was asserting that the patent system at that time had “well-settled rules” about the precise issue before the Court in the case. The Patent Office had literally no rules relevant to the claiming issue relevant in *Merrill*. The Patent Office’s “Rules and Regulations” of the era did not even bother to list “claims” as a distinct part of the patent application, even though the rules did contain distinct rules for the “Drawings,” the “Model,” and the “Specification” generally. Moreover, to the extent the

5. *Merrill*, 94 U.S. at 572–73.

6. *Id.* at 573.

7. *Id.*

8. *Id.*

9. *Id.* at 573–74.

10. *Compare* U.S. Patent No. 9,474,534 (issued Oct. 25, 2016), *with* Eur. Patent No. 2,964,200 (issued Apr. 19, 2017) (setting forth identically worded claims to the U.S. patent).

Patent Office's rules addressed the formatting of claims—which was the center of the controversy in *Merrill*—they did so only in a short appendix of exemplary claims, and the example most relevant to the issue in *Merrill* had the same structural issue that the Court faulted the patentee in *Merrill* for having. In sum, while correct in thinking that patent law was developing and progressing, the Court badly overestimated the degree of progress that the law had made by the time that the patent in *Merrill* had issued.

A third conclusion is that progress in the law of claiming has occurred only slowly and in a highly decentralized manner. Finding well-settled rules in the nineteenth-century law on patent claiming is difficult because almost every aspect of claiming, or at least every substantive aspect of claiming, was still in flux for decades after the Court's decision in *Merrill*. The development of patent claiming practice appears to have been driven in the first instance by practitioners themselves experimenting with different stylistic and substantive formats. The Patent Office may have had the power to enforce uniformity, but it rarely did. And, even where the Patent Office did guide the practice, that guidance was not immune from being later upset by judicial decisions (quite possibly including the *Merrill* decision). The multiplication of claims—a development frequently, and to some extent correctly, decried as undermining the certainty of property rights that claims were supposed to provide—is a predictable and rational response by attorneys to the uncertainty surrounding claiming practice that both preceded and followed *Merrill*.

I. *MERRILL V. YEOMANS* AND THE PROPER FORMAT FOR COMPOSITION OF MATTER CLAIMS.

The patent in *Merrill v. Yeomans* was issued on May 18, 1869.¹¹ The first sentence in the patent declares that the inventor Joshua Merrill has “invented a new and improved Manufacture of Deodorized Heavy Hydrocarbon-Oils, suitable for lubricating-oils, or for curriers' use.”¹² The key ambiguity in that portion of the sentence lies in the word “Manufacture,” which could mean either the product manufactured or the process for manufacturing. That ambiguity continues throughout the patent into the patent's first claim, which reads:

I claim—

[t]he above-described new *manufacture* of deodorized heavy hydrocarbon-oils, suitable for lubricating and other purposes, free

11. U.S. Patent No. 90,284 (issued May 18, 1869); *see also Merrill*, 94 U.S. at 568.

12. *Id.* at 1.

from the characteristic odors of hydrocarbon-oils, and having a slight smell like fatty oil, from heavy hydrocarbon-oils, by treating them substantially as hereinbefore described.¹³

In the litigation, which commenced on March 25, 1870 (less than a year after the patent was issued), the plaintiff asserted that “manufacture” referred to a product.¹⁴ The defendants claimed it was directed only to a process for making the deodorized oil and that they could not be held liable for infringement because they were not using that process.¹⁵

The Court began its analysis with the correct observation that “[t]he word ‘manufacture’ in this sentence is one which is used with equal propriety to express the process of making an article, or the article so made.”¹⁶ The Court also noted that, “if all which is described as new in these specifications is really so,” the inventor had made sufficient advances to have “a right to a patent for three inventions:—

1. For a modification or improvement in the distilling apparatus.
2. For a new process or mode of distilling heavy hydrocarbon oils, by which they are deprived of their offensive odors.
3. For the product of this new process of distillation; namely, the deodorized heavy hydrocarbon oils fitted for use in the arts.”¹⁷

The first of these three potential inventions (the improved distilling apparatus) was covered the patent’s second claim, but that claim was not asserted as being infringed. The difficulty in the case was whether the patent’s first claim to the “manufacture” covered the second or third of the Inventions listed by the Court—i.e., covered the *process* or the *product*.

To resolve the ambiguity, the Court relied mainly on three arguments, which will be covered here in descending order of persuasiveness. The Court’s first and best point concerned the language of the claim itself, which concludes with what appears to be a process step—“by treating [the hydrocarbon oils] substantially as hereinbefore

13. *Id.* at 2 (emphasis added). The *Merrill* Court’s quotation of the claim has some slight errors, but none that affects the Court’s analysis. *See* 94 U.S. at 570 (quoting the patent claim but adding the word “is” before “hereinbefore” and omitting two hyphens).

14. Transcript of Record at 1, *Merrill v. Yeomans*, 94 U.S. 568 (1877) (No. 209).

15. *Id.* at 3; *see also Merrill*, 94 U.S. at 568 (explaining that if the patent is for the process only, then the defendants will not be found to have infringed).

16. *Merrill*, 94 U.S. at 570–71.

17. *Id.* at 569.

described.”¹⁸ The Court thought that the inclusion of such a process step resolved the ambiguity so that “the most natural meaning” of the claim language was “I claim this new *mode of manufacturing hydrocarbon oils*, by treating them as hereinbefore described.”¹⁹ That is the Court’s best point, although the language could more naturally be read to mean that the patentee was trying to claim what modern patent practitioners call a “product-by-process” claim, which is a claim directed to a product but only if that product is made by a certain specified process.²⁰ The trial court in *Merrill* had adopted that interpretation,²¹ but because the oils sold by the defendants in the case “were produced by a process very different from that described [in the patent],”²² Merrill still lost his infringement case at trial. Thus, on appeal to the Supreme Court, Merrill’s counsel “disclaim[ed]” the trial court’s interpretation that the claim covered only a product produced by the process described in the patent.²³ That disclaimer forced the Court to choose between reading the claim as a pure product claim or a pure process claim, and given that choice, the Court was probably correct that the latter reading is supported the inclusion of the process step in the claim language.

The Court next advanced contextual arguments based on the language in the rest of the specification. One sentence in the specification declared that Merrill’s “invention will be used . . . to produce the deodorized heavy oils above described.”²⁴ In that sentence, the Court noted, “[i]t is very clear that what he here calls his invention is a thing which produces the deodorized oils, and not the oil itself.”²⁵ While that’s true, the Court itself recognized that Merrill had properly claimed his improved “distilling apparatus” as one of the two claimed inventions in the patent.²⁶ His reference to invention in the sentence quoted by the Court could have been properly referring to the claimed distilling apparatus and not his claimed new “manufacture.” In another

18. *Id.* at 571 (quoting U.S. Patent No. 90,284 (issued May 18, 1869)).

19. *Id.* (emphasis added).

20. *See Patent Claim*, BLACK’S LAW DICTIONARY (11th ed. 2019) (defining a product-by-process claim as “[a] patent claim defining a product through the process by which it is made”).

21. *Merrill v. Yeomans*, 17 F. Cas. 113, 115, 117 (C.C.D. Mass. 1874) (No. 9,472), *aff’d*, 94 U.S. 568 (1876).

22. *Merrill*, 94 U.S. at 571.

23. *Merrill*, 94 U.S. at 571.

24. *Merrill*, 94 U.S. at 572 (quoting U.S. Patent No. 90,284 (issued May 18, 1869)).

25. *Id.*

26. *Id.* at 570.

place in the specification, Merrill had used the word “manufacture” in a way that unambiguously referred to a process,²⁷ but a word having two meanings could properly be used within the same document to have one of its meanings in one sentence and the other meaning in a different sentence. In sum, the Court’s contextual arguments are suggestive but not dispositive.

Third and finally, the Court made a structural argument about the patent specification, which the Court describes as being “almost wholly directed to the apparatus, the mode of using it, and the peculiar process of distillation.”²⁸ “Why should this be so,” the Court asked rhetorically, “if the applicant for the patent was only looking to the products as his invention,—the deodorized heavy hydrocarbon oils?”²⁹ The Court concluded that “[i]f the oil alone was to be patented, by whatever process made, this elaborate description of one particular process was unnecessary.”³⁰ That’s very clearly the Court’s worst argument, for the Patent Act then (and still today) requires a complete disclosure of “the manner and process of making” an invention.³¹ Thus, even if Merrill intended to claim a product (the deodorized oils), he was still required by law to disclose the details of how to make the product.

The main point here is not to relitigate the proper interpretation of the word “manufacture” in the context of Merrill’s patent, nor to argue that the outcome in the case was wrong. Indeed, given the Merrill’s disclaimer of a product-by-process interpretation, the Court seems correct in rejecting a claim interpretation that would have given Merrill rights to all deodorized heavy oils however produced. The most important point for purposes of this article is that, despite the opinion’s reference to the “well-settled rules” of the patent system, the Court cited not one authority providing a settled rule favoring its interpretation over the alternatives. Indeed, the entire *Merrill* opinion

27. *Id.* at 572 (noting that, in the sentence beginning “[i]n carrying on my new manufacture of deodorizing heavy oils with this apparatus, I place the oil to be deodorized in the still ...,” the word “manufacture” must refer to the process).

28. *Id.*

29. *Id.*

30. *Id.*

31. Patent Act of 1836, § 6, 5 Stat. 117, 119 (requiring disclosure of “the manner and process of making” the invention in “full, clear, and exact terms”); 35 U.S.C. § 112(a) (2018) (requiring disclosure of “the manner and process of making” the invention in “full, clear, concise, and exact terms”). Note that, although *Merrill* was decided after the enactment of the 1870 Patent Act, the 1836 Patent Act would have still applied to the patent in the case, as it was issued prior to the enactment of the 1870 Act.

contains no citations to any authority *whatsoever*—no case cites, no treatises, no administrative rulings, no statutes, nothing.³²

That omission of authority was not an oversight on the Court's part. Attorneys of that era who sought guidance on how to write claims would find little authoritative help, and on the issue specifically relevant to the outcome in *Merrill*, the law would be filled with uncertainty for more than a century.

At the time *Merrill*'s patent issued, the Patent Office had given almost no guidance on claiming. The agency's then-existing pamphlet of rules, published on August 1, 1867, includes no separate section for rules governing claims or claim format.³³ By contrast, the rules pamphlet does include separate sections for "Drawings" and "Model[s]," each of which contains detailed rules such as a rule requiring drawings to be "fifteen inches from top to bottom, and ten inches across" and another rule requiring models to be "made of durable material, and not more than one foot in length or in height, unless a larger model is necessary to exhibit the invention."³⁴

The rules on claiming, to the extent that the pamphlet can be viewed as having any such rules, are contained entirely in the ten rules—barely two pages of text—governing the form and content of the specification. The first of those rules states merely that "[t]he applicant must set forth in his specification the precise invention for which he claims a patent."³⁵ The next rule governs "improvements" and warns that "the specification"—not the claims—"must distinguish between what is admitted to be old and what is described and claimed to be the improvement."³⁶ Two rules describe the agency's general policy against including separate inventions in the same application, with the agency warning that it could require the applicant to "divide" an application containing multiple inventions, but granting an exception permitting multiple inventions in one application where they "have a necessary and dependent connection with each other."³⁷ The fifth rule states

32. *See Merrill*, 94 U.S. at 568–74 (citing no authority of any kind). Two passages referring to (but not citing) the "act of Congress" and its requirement that a patent applicant include a "statement of his invention"—i.e., "a distinct and specific statement of what he claims to be new, and to be his invention"—are the closest the Court comes to citing any authority in its opinion. *Id.* at 569–70.

33. *See* U.S. PAT. OFF., RULES AND DIRECTIONS FOR PROCEEDINGS IN THE PATENT OFFICE (Aug. 1, 1867) [hereinafter 1867 PATENT RULES] (setting forth the complete set of rules governing the form and contents of a patent application).

34. *Id.* at 12 (rule 20) & at 13 (rule 23).

35. *Id.* at 10 (rule 10).

36. *Id.* (rule 11).

37. *Id.* (rules 12 & 13).

requirements for the application to be signed by the inventor or agent and for the specification to describe any drawings, and it concludes with two short examples of specifications, only one of which is complete.³⁸ The final five rules provide details about the signatures and oaths required for filing the application.³⁹

The two exemplary specifications set forth with the rule provide little information about claim drafting. The first example shows a short but complete specification for “a new and improved mode of preventing steam-boilers from bursting.”⁴⁰ Both that introductory sentence and the claim appear to be directed to a process, with the claim of the example reading:

What I claim as my invention, and desire to secure by letters patent, is the application to steam-boilers of a fusible alloy which will melt at a given temperature and allow the steam to escape, as herein described, using for that purpose the aforesaid metallic compound, or any other substantially the same, and which will produce the intended effect.⁴¹

Yet elsewhere in the exemplary specification, the disclosure reads as if the inventor views the invention as a machine—a “steam-boiler”—not a process for making steam-boilers safe. For example, the specification states that “[t]o enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation”⁴² and then the specification includes a narrative from the inventor explaining how “I construct my steam-boiler . . . ,”⁴³ which reads as if the invention being made is the boiler itself. In sum, the exemplary specification seems to vary in describing the invention as a process and as a machine.

The second example of a specification is incomplete. It instructs how to “commence” the specification covering a machine, but the example merely describes the claim for a machine by saying it “should express the nature and character of the invention, and identify the parts claimed separately or in combination.”⁴⁴ In addition, a single short sentence notes that, “[i]f the specification is for an improvement, the

38. *See id.* at 10–11 (rule 14).

39. *Id.* at 11–12 (rules 15–19).

40. *Id.* at 10.

41. *Id.* at 11.

42. *Id.* at 10.

43. *Id.*

44. *Id.* at 11.

original invention should be disclaimed, and the claim confined to the improvement.”⁴⁵

The agency generated a bit more guidance on claim writing in a new rule pamphlet published on August 1, 1869.⁴⁶ Though that pamphlet did not issue until three months after the patent at issue in *Merrill*, it is still relevant because, if the agency had given clear guidance about the rules for claiming compositions of matter, Merrill’s attorneys would still have had time prior to initiating litigation against Yeomans to seek a reissued patent clarifying the patent’s claims.

Merrill’s attorneys would not have thought to seek reissue, however, because the rules governing claiming were once again essentially nonexistent in the 1869 pamphlet.⁴⁷ The new rule book did contain an appendix setting forth three brief examples for specifications covering utility patents, including one directed to a “process” and another directed to a “composition of matter” (see Figure 1 for the complete example of the specification for a composition of matter).⁴⁸ If Merrill’s attorneys had looked at those examples, they would have been reasonably confident that they had succeeded in claiming a composition of matter, not a process.

45. *Id.*

46. U.S. PAT. OFF., RULES AND DIRECTIONS FOR PROCEEDINGS IN THE PATENT OFFICE (Aug. 1, 1869) [hereinafter 1869 PATENT RULES].

47. As before, no separate section provides rules on claims, even though separate sections provide rules governing the specification, the drawings and the model. *Id.* at 4–7 (rules 10–30). The rules governing specifications are nearly identical to those in the 1867 pamphlet, except the number of rules is decreased from ten to eight by combining some of rules governing oaths. *Compare id.* at 4–5, with 1867 PATENT RULES, *supra* note 33, at 10–12.

48. 1869 PATENT RULES, *supra* note 46, at 29–30. The other example for specifications covers a “machine.” *Id.* at 27.

17. FOR A COMPOSITION OF MATTER.

Specification.

Benjamin Browning, deceased, late of Charleston, in the district of Charleston, and State of South Carolina, during his lifetime invented a certain compound called "wool oil," to be used instead of lard, rape-seed, or other oils, in the manufacture of wool.

The nature of the invention of the said Browning consists in mixing olive, lard, or rape-seed oil with a solution of oil of soap dissolved in hot water.

To prepare the wool oil, take a quantity of oil soap of any kind, provided the quality be good, and dissolve the same in hot water, say about thirty pounds of oil soap to thirty gallons of water, or a sufficient quantity of soap to saturate the water. Then take equal parts, by measure, of olive, lard, rape-seed, or any other kind of oil which can be used on wool in the process of its manufacture, and mix it with the preparation aforesaid, to wit, the soap solution, which, after such mixture, is ready to be used on the wool with as beneficial an effect as if pure oil only had been used. This wool oil will not decompose by age, because the oil of soap neutralizes the stearine in the oil; hence there is nothing to decompose. And for the same reason spontaneous combustion cannot be produced.

Claim.

I claim as the invention of the said Benjamin Browning the manufacture or preparation of a compound, which is denominated wool oil, of the ingredients, in the proportions, and for the purposes set forth.

EBENEZER WHITNEY,
Administrator.

Witnesses: JOHN M. THOMPSON.
ARTHUR BARTON.

Figure 1: The Exemplary Patent Specification and Claim for a Composition of Matter Set Forth in the Patent Office's 1869 Rules Pamphlet

The exemplary claim for a process expressly uses the word "process" and immediately couples it (through the word "of") with a gerund ("applying") to signify a step in doing something. It reads:

Claim.

We claim as our invention the process of preparing the lime as set forth, and of applying it, when newly slacked and warm, to wheat, before passing the latter through a smut-mill, so as to cleanse the wheat from all impurities, substantially as described.⁴⁹

That claim looks nothing like Merrill's. By contrast, the model claim for a composition of matter looks very much like Merrill's claim, for it begins by describing the invention as a "manufacture" "of" a physical product. The claim reads:

49. *Id.* at 29.

Claim.

I claim as my invention the manufacture or preparation of a compound, which I denominate wool oil, of the ingredients, in the proportions, and for the purposes set forth.⁵⁰

Three additional features of this sample claim deserve special attention. First, the thing claimed is described as either the “manufacture” or the “preparation” of a compound. Both of those words in their noun forms can mean either the process of making or preparing a thing or the thing that is made or prepared. In both cases, the dominant usage of each word in the nineteenth century was to refer to the process, with the thing produced being a secondary meaning.⁵¹

Yet the dominant usage of the word “manufacture” in U.S. patent law was different, or at least that was the view of the then most prominent treatise on the subject. The 1867 edition of George Curtis's treatise on patent law noted that, while in English patent law the word “manufacture” had come to mean both the process of making articles and the articles so made, that meaning did not carry over to the U.S. patent law.⁵² Because the U.S. “made an enumeration of the different classes of subjects which in England are held to be patentable, it is to be presumed that this term [“manufacture”] was used to describe one of these classes only, namely, fabrics or substances made by the art or industry of man.”⁵³ Thus, in U.S. patent law, a “manufacture” was “presumed” to cover not processes (or, the contemporaneous word, “arts”), but instead the “substances” made by those arts.

Second, the final portion of the claim—“for the purposes set forth”—literally restricts the claim to covering the manufacture only

50. *Id.* at 30.

51. The best source for proving this point is the 1893 Funk & Wagnalls Dictionary. *See* 1 & 2 A STANDARD DICTIONARY OF THE ENGLISH LANGUAGE (Isaac K. Funk ed., 1893) [hereinafter STANDARD DICTIONARY]. That dictionary was published less than a quarter century after the 1869 rules, and importantly, its “sense order rule”—the rule by which it presented numbered definitions of a word—was not “historical order” but was instead that “the most common meaning has been given first.” 1 *id.* at xi. For manufacture in its use as a noun, the dictionary gives as its first definition, “The operation of making articles for use by working on or combining material; the production of goods, etc., by industrial processes or art” 2 *id.* at 1078. For “preparation,” the first entry is “[t]he act of preparing or fitting for some use or purpose” 2 *id.* at 1404. The highest ranked definition for the thing being produced is the fourth, which defines preparation as “[s]omething made or prepared, especially a compound, concoction, or composition.” *Id.*

52. *See* George Ticknor Curtis, A Treatise on the Law of Patents §§ 25–27, at 19–21 (1867).

53. *Id.* § 27, at 20.

when it is used for specific purposes. Even if “manufacture” is interpreted to be a composition of matter, modern patent law would view a claim to a composition for certain purposes or uses as covering a process, as § 100(b) of the Patent Act expressly defines a claim directed to a particular “use of a . . . composition of matter” as being a process claim.⁵⁴

Third, the grammar of the claim could easily be seen as pointing toward the claim covering a process, not a composition. The claim does not say it is directed to “the manufacture or preparation, which is denominated wool oil”—a format in which “manufacture or preparation” would unambiguously be the product, the wool oil. It instead claims “the manufacture or preparation of a compound, which is denominated wood oil, . . .” The wool oil is the “compound” or composition of matter, and the claim is directed to the “manufacture or preparation” of that compound. Reading the claim as a process seems even more appropriate given the most common definition of preparation, which is “[t]he act of preparing or fitting for some use or purpose.”⁵⁵ Interpreting “preparation” as an act of preparing explains why “for the purposes set forth” appears later in the claim. This problem with the exemplary claim seems to have been eventually detected by the Patent Office, for in its 1871 rules pamphlet, it eliminated the “manufacture or preparation” language and directed the claim to cover simply “a compound.”⁵⁶ But that change happened after two years of publishing versions of the pamphlet with the model claim for a composition of matter being directed to “the manufacture or preparation of a compound.”⁵⁷ And of course, the change in guidance happened more than a year after Merrill had initiated the infringement litigation against Yeomans.

In sum, the Patent Office’s contemporaneous guidance for inventors and attorneys seeking to claim a composition of matter reads at least as much like a process claim as the claim in *Merrill*. Yet the Patent Office’s publication of such a claim as a model for composition of matter claims would not have alerted reasonable attorneys of the era that

54. 35 U.S.C. § 100(b) (2018) (defining “process” to “include[] a new use of a known process, machine, manufacture, composition of matter, or material”).

55. STANDARD DICTIONARY, *supra* note 51, at 1404 (emphasis added).

56. U.S. PAT. OFF., RULES AND DIRECTIONS FOR PROCEEDINGS IN THE PATENT OFFICE, at 39 (Aug. 1, 1871). The new version of the example reads: “I claim, as the invention of the said [hypothetical inventor], a compound composed of any of the oils ordinarily used on wool in its manufacture, and a solution of oil soap, substantially in the proportions and for the purposes set forth.” *Id.*

57. In addition to the 1869 Rules, the agency’s 1870 rules pamphlet included the same language. *See* U.S. PAT. OFF., RULES AND DIRECTIONS FOR PROCEEDINGS IN THE PATENT OFFICE, at 35 (July 15, 1870).

inclusion of some process language would undermine any attempt to claim a composition of matter as a new manufacture. With hindsight, the claim's flaws might be obvious, but hindsight can be deceptive in making the hidden seem clear.

If the Patent Office's hypothetical claim for a composition of matter contains flaws, the source material for that claim is even worse. The Patent Office's hypothetical specification and claim was modeled on an actual 1855 patent which, like the exemplary specification set forth in the 1869 Office rules, begins with an unequivocal assertion that the inventor believes himself to have invented a new thing, not a process (see Figure 2 for the complete specification of the actual 1855 patent).⁵⁸

UNITED STATES PATENT OFFICE.

E. FREEMAN PRENTISS, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN LUBRICATING COMPOUNDS.

Specification forming part of Letters Patent No. **12,964**, dated May 29, 1855.

To all whom it may concern:

Be it known that I, E. FREEMAN PRENTISS, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and improved compound oil, called "Wool-Oil," to be used in the manufacture of wool in the place of olive, lard, rape-seed, or other oils, which are more expensive than my compound wool-oil; and I do hereby declare that the following is a full and exact description of the ingredients and mode of manufacturing the said wool-oil.

The nature of my invention consists in the preparation and manufacture of an oil which answers the same purpose and is much cheaper than the various kinds of oils which are used in the manufacture of woolen goods of all descriptions in carding and weaving.

To prepare the wool-oil I take a quantity of oil-soap, indifferent as to lime provided the quality be good, and dissolve the same in hot water—say about thirty pounds of oil-soap to thirty gallons of water, or a sufficient quantity of hot water to entirely dissolve the oil-soap, as the water will only dissolve a certain quantity of the oil-soap. I then take an equal quan-

tity—gallon for gallon—of olive, lard, rape-seed, or any other kind of oil which can be used on wool in the process of its manufacture, and mix with it the preparation aforesaid—to wit, the soap solution—which, after such mixture, is ready to be used on the wool with an equally beneficial effect as if pure oil only had been used. The said wool-oil will not decompose by age. Neither can spontaneous combustion be produced from its use on wool. It will not decompose, because the oil of soap neutralizes the stearine matter in the oil. Hence there is nothing to decompose, and spontaneous combustion cannot be produced for the same reason.

What I claim as my invention, and desire to secure by Letters Patent, is—

The manufacture or preparation of a compound which I denominate "wool-oil," of the ingredients in the manner and for the purpose set forth.

E. FREEMAN PRENTISS.

Witnesses:

SAMUEL GRANT, Jr.,
C. PEMBERTON.

Figure 2: The 1855 Patent on "Wool-Oil" Selected by the Patent Office as the Basis for the Model Specification and Claim Set Forth in the Agency's 1869 Rule Pamphlet

58. Compare U.S. Patent No. 12,964, at 1 (filed May 29, 1855), with 1869 PATENT RULES, *supra* note 46, at 30.

The inventor asserts that he “ha[s] invented a new and improved compound oil, called ‘Wool-Oil,’ to be used in the manufacture of wool in the place of olive, lard, rape-seed, or other oils.”⁵⁹ Yet that claim even more clearly seems to read like a process:

What I claim as my invention, and desire to secure by Letters Patent, is—

The manufacture or preparation of a compound which I denominate “wool-oil,” of the ingredients in the manner and for the purpose set forth.⁶⁰

That claim seems to incorporate process conditions governing both the making and the using of the compound, for the claim it covers the manufacture of a compound “in the manner” and “for the purpose” set forth in the patent. To the extent that the *Merrill* Court was asserting that patent law had “settled rules” not being followed by Merrill and his attorneys, the very patent claim selected by the Patent Office as an example—both in its original form and as modified by the agency in its rule pamphlet—shows the absence of certainty about claiming practices.

In addition to the problems in its claim language, the Patent Office’s exemplary specification has the same inconsistencies identified by the Supreme Court in Merrill’s specification. The exemplary specification uses the word “manufacture” twice in sentences where the word could refer only to a process, not to a product.⁶¹ And just as in Merrill’s specification, the exemplary specification describes the relevant “invention” in process terms, stating that “[t]he nature of [the] invention . . . consists in *mixing* [various ingredients] with a solution of oil soap dissolved in hot water.”⁶² That sentence sounds like a recipe, and recipes are fundamentally processes—a series of steps toward making a product. Yet the Patent Office’s example demonstrates that inventors in 1869 could reasonably have claimed their inventions as a

59. U.S. Patent No. 12,964, at 1 (filed May 29, 1855). The hypothetical specification in the 1869 rule begins with the highly similar assertion that the inventor (the agency used a pseudonym) “invented a certain compound called ‘wool oil,’ to be used instead of lard, rape-seed, or other oils, in the manufacture of wool.” 1869 PATENT RULES, *supra* note 46, at 30.

60. *Id.*

61. *See* 1869 PATENT RULES, *supra* note 46, at 30 (referring in separate sentences to oil “used . . . in the manufacture of wool” and oil “used on wool in the process of its manufacture”). In both sentences, “manufacture” must bear its meaning as a process, even though “manufacture” in the claim is supposed to refer to a composition of matter.

62. *Id.*

recipe for making a new product and still believed that they were obtaining patent rights covering the new product itself.

Examining the Patent Office's contemporary guidance on claiming—to the extent that the Patent Office had given any guidance—shows that the *Merrill* Court was being unrealistic in demanding that inventors exercise “accuracy, precision, and care in the preparation of all the papers on which the patent is founded.”⁶³ In making that demand, the Court emphasized the importance of both the public's interest in “being clearly told what it is that limits [the public's] rights” and later inventors' interests in being free to make new improvements without being “restrained by vague and indefinite descriptions of claims in existing patents.”⁶⁴ Yet those interests cannot be well served if, as seems nearly certain, the patent claim held out by the Patent Office as a model for protecting a composition of matter would not have been held to cover a composition of matter under the Court's analysis. Moreover, interests in providing public notice of patent rights must be balanced against the interests of inventors in being able to protect their inventions even though they have access to lawyers possessing only ordinary skill in the art of patent law. Those lawyers should not be expected to do a job better than even the Patent Office of the time could do.

The briefing in *Merrill* provides a final and ultimate indication of how little certainty there was in claiming practices at the time of *Merrill*. In over 300 pages of combined briefing to the Supreme Court, neither party to the litigation even bothers citing to the Court the Patent Office's guidance on claiming.⁶⁵ This surprising fact is true even though “wool oil”—the subject matter of the hypothetical composition of matter claim in the Patent Office's 1869 rule pamphlet—happens to be a related technology to Merrill's deodorized oil, so wool oil itself *is mentioned more than 20 times* in the depositions and briefs that form the record of the case at the Supreme Court.⁶⁶ Furthermore, what are today basic concepts of patent law are shown to be uncertain at the time. Thus, for example, the defendants in the case argued it “questionable as a matter of law, whether there can be a patent for *a new article however made*.”⁶⁷ If there were “settled rules” of patent law that would allow the public to perceive “clearly” the limits of patent

63. *Merrill v. Yeomans*, 94 U.S. 568, 573 (1876).

64. *Id.*

65. See Brief for Appellees, *Merrill v. Yeomans*, 94 U.S. 573 (1877) (No. 209); Appellant's Brief, *Merrill v. Yeomans*, 94 U.S. 573 (No. 209); Supplementary Brief for Appellants, *Merrill v. Yeomans*, 94 U.S. 573 (1877) (No. 209).

66. See Transcript of Record, *Merrill v. Yeomans*, 94 U.S. 573 (1877) (No. 209) (searching “wool oil,” yields 28 instances of the phrase).

67. Brief for Appellees at 8, *Merrill v. Yeomans*, 94 U.S. 568 (1876) (No. 209) (emphasis in original).

rights, the parties to the *Merrill* litigation, and the Patent Office itself, were not capable of finding or articulating them.

The *Merrill* Court's reference to the “settled rules” of patent law is, however, subject to one interpretation that makes sense of the entire opinion in the proper historical context. In the whole of its opinion, the Court refers to only one principle or doctrine of patent law that the Court itself describes as a “rule.” That rule, which the Court recognizes as supported court precedents cited by the parties (but uncited in the Court's opinion), is that, “where it appears that a valuable invention has really been made, this court, giving full effect to all that is found in the application on which the Patent Office acted, will uphold that which was really invented, and which comes within any fair interpretation of the patentee's assertion of claim.”⁶⁸ The Court expressly states that “this rule”—that claims should be interpreted, if fairly possible, to cover what is “really invented”—is being followed in the case. That passage in the Court's opinion provides the best key to understanding what core rule of patent law was relevant to the case and was really settled at the time of *Merrill*. It was not a rule about the style or format of writing claims; it was a rule about how courts should approach construing claims in light of the actual technological contributions disclosed by the inventor.

Merrill's contribution in the field was in developing a process to deodorize heavy oils and in using that process to produce a product. But as the Court noted early in its opinion, Merrill was able to describe the article produced—to the extent he could describe it *not* in terms of the process by which it is made—only “in short terms” with the “main feature” of the article described as being “its freedom from the offensive odor which, before his invention, seemed to be an inseparable quality of those oils.”⁶⁹ If omniscient attorneys had tried to write a pure product claim—i.e., not a product-by-process claim—to cover such a product, could they have done so based on Merrill's then-existing knowledge of the product? The answer is almost certainly “no.”

Merrill's knowledge of the product, as disclosed in the patent specification, encompassed two facts. First, the product was produced by his process. Second, the product had a functionally desirable feature—it did not smell bad. The first fact would support a product-by-process claim, but as the trial court's decision proved, such a claim would not help Merrill win his case (and hence his attorneys disclaimed that interpretation of the actual claim in the Supreme Court). If the product is not defined by the process that made it, it could be defined only by the functional feature—the lack of an offensive odor. Yet

68. *Merrill*, 94 U.S. at 573.

69. *Id.* at 569.

compositions of matter, just like other inventions, cannot be defined in purely functional terms.

That last point is clear today, and backed up by multiple Supreme Court decisions condemning purely functional claiming both generally and in composition of matter claims.⁷⁰ Indeed, the section of the modern Patent Act governing claim format (§ 112) permits attorneys to define a claim element in terms of its ability to perform a function *only if* that element is *not* the only element in the claim, and then still the functional claim language is limited by the means or steps for performing the function that are disclosed in the patent's specification.⁷¹

Yet even in the second half of the nineteenth century, the ability of an inventor to claim a composition of matter solely in terms of its function was doubtful at best. For example, Robinson's 1890 patent law treatise states that a composition of matter claim had to disclose the elements of the composition *and* "the mode of their union."⁷² To back up that point, Robinson relied on the 1868 *Goodyear v. Berry* case for the proposition that "a Claim for a chemical composition covers only the *same use* of the same or equivalent ingredients."⁷³ The *Goodyear v. Berry* court was even more clear on the point, stating that, for patented chemical compositions, "the exclusive right to the invention imports nothing but protection against the use of the same, or substantially the same elements *compounded and treated on principles substantially the same as those of the patented article*."⁷⁴ The court summed up the point by stating that "a patent right does not cover every possible mode of accomplishing the result proposed by an inventor."⁷⁵

70. *Halliburton Oil Well Cementing Co. v. Walker*, 329 U.S. 1, 12 (1946) (invalidating a "functional claim" due to its "broadness, ambiguity, and overhanging threat"); *General Elec. Co. v. Wabash Appliance Corp.*, 304 U.S. 364, 371 (1938) (invalidating a claim for using "conveniently functional language at the exact point of novelty"); *Holland Furniture Co. v. Perkins Glue Co.*, 277 U.S. 245, 257 (1928) (rejecting the idea that a composition of matter claim can be defined "by describing the product exclusively in terms of its use or function").

71. See 35 U.S.C. § 112(f). See also Robert P. Merges & John F. Duffy, *Patent Law and Policy* 39–40 (8th ed. 2021) (discussing the limitations of § 112(f) including the prohibition on "single means" claims—claims with only one element defined in functional terms).

72. 2 William C. Robinson, *The Law of Patents* § 532, at 148 (1890).

73. *Id.* § 532 n.3, at 148 (emphasis added) (citing *Goodyear v. Berry*, 10 F. Cas. 631 (C.C.D. S. Ohio 1868) (No. 5,556)).

74. *Goodyear*, 10 F. Cas. at 635 (emphasis added).

75. *Id.*

Thus, the best view of the Court's decision in *Merrill* is that the Court followed its settled rule of matching patent rights to what the inventor "really invented." For Merrill's invention, that rule meant rights to a process or to a product-by-process, neither of which would win Merrill his infringement case against Yeomans. If Merrill wanted more—if he wanted to push the envelope of what he could possibly claim given his technological contribution—the Court suggested that he should "surrender" his current patent and seek a "reissue."⁷⁶ That administrative procedure would have allowed the Patent Office to pass on whether Merrill could define his product—his deodorized heavy oils—in some acceptable way that did not rely on the process for making it and that did not describe the product in purely functional terms.

II. DEVELOPMENTS AFTER *MERRILL*: CONTINUED UNCERTAINTY IN CLAIMING

Merrill raised the prominence of claims, but it would be a major mistake to believe that the rising importance of claims produced more certainty in claiming practices. For decades after *Merrill* declared claims as "of primary importance" in defining patent rights, the Patent Office continued to include essentially no meaningful rules about claiming even while it continued to have, for example, multiple rules covering the formatting of drawings.

The agency's rule pamphlets continued to provide examples, but just as the 1869 example for claiming a composition of matter probably was not reliable, other exemplary claims contained some nasty surprises for attorneys who followed them. For example, from 1869 onward, the agency's exemplary claims for machines had always included reference letters relating the elements of the claims to the drawings. For example, one machine claim in the agency's 1888 rule pamphlet reads: "The combination, in a meat-chopping machine, of the reciprocating rod H, carrying the knives *d d*, the cross-head C, . . ."⁷⁷ While that convention was not required by rule—the rules said only that the "description" in the specification had to include references to the drawings "by letters or numerals"⁷⁸—the vast majority of applicants

76. *Merrill*, 94 U.S. at 573.

77. U.S. PAT. OFF., RULES OF PRACTICE IN THE UNITED STATES PATENT OFFICE 70 (Apr. 18, 1888).

78. *Id.* at 12. The 1869 rules had also not required claims to have reference letters but had instead said merely that the "specification should describe the drawings, . . . and refer by letters and figures to the different parts." 1869 PATENT RULES, *supra* note 46, at 5.

followed the agency's exemplary machine claim and included letters to connect the claim elements to the drawings.⁷⁹

That practice, though encouraged by the Patent Office's claim examples, declined swiftly following the Supreme Court's 1888 decision in *Weir v. Morden*, which used the presence of such reference characters to narrow a claim based on the particular configuration of the elements shown in the drawings.⁸⁰ The inventor in that case otherwise had a pretty good argument for a broader construction of the claim based on the claim's text and the principle of "claim differentiation."⁸¹ The drawing references, however, led to a narrow interpretation and a complete loss in the infringement litigation for the inventor.⁸² A dozen years after *Weir*, only 22% of claims included such references to the drawings; two decades later, the practice was nonexistent.⁸³

While providing little or no guidance in the form of rules, the Patent Office was continuing after 1869 to provide a stream of published decisions by the Commissioner (then the agency's head) concerning issues of patent law, including the proper form and scope of patent claims.⁸⁴ To be sure, most Commissioner decisions did not concern patent claims. Issues addressed included points on novelty, interferences, patent term extensions, joint inventorship, the format for oaths and internal office procedure.⁸⁵ Still, over the course of decades, administrative decisions became an important source of precedents concerning the style and substance of claims.

Commissioner decisions were, however, much like judicial decisions in the sense that they were always counterpunches. Patent attorneys were the first movers. They had to decide on format, scope, and number of claims. They were the ones innovating, not the agency and not the courts.

Moreover, the agency was a middle-tier player. Unlike the courts, the agency could not definitively rule on the propriety of a format or,

79. See RIDSDALE ELLIS, PATENT CLAIMS § 6, at 7 (1949) (setting forth data showing 83% of claims in 1880 included reference characters connecting claim elements to the drawings).

80. 125 U.S. 98, 107 (1888).

81. See Merges & Duffy, *supra* note 71, at 660–64 (discussing the use of, and limitation on, the canon of "claim differentiation," which creates a general presumption that different claims should be interpreted to have different scopes).

82. *Id.* at 107–08.

83. See ELLIS, *supra* note 79, § 6, at 7 (setting forth data showing 22% of claims in 1900, and 0% in 1920, included drawing reference characters in the claims).

84. *See id.*

85. *See id.*

as in the case of including drawing references in claims, on the consequences of that format.⁸⁶ That position meant that the agency was generally willing to give attorneys substantial latitude in choosing not only the number of claims (as discussed below in Part III), but also the format. For example, an early Commissioner decision made clear that the use of drawing references in claims was optional only—an option that many patentees would (wisely) decline after the Supreme Court’s decision in *Weir*.⁸⁷

Precisely because the agency did not, and perhaps could not, create and maintain settled rules about patent claiming, certainty on any particular point was elusive. Once again, the patent in *Merrill* provides a good example of that continuing uncertainty.

Though the Supreme Court held the claim at issue in *Merrill* to be a product claim, that interpretation was not obviously correct. The trial court in *Merrill* interpreted the claim to be directed to a product, but only to the product as produced by a particular process. The trial judge reasoned that it was permissible for a patentee “to claim broadly the new product, however made, or to claim the new product when made by a described process.”⁸⁸ That latter interpretation, the judge opined, “is the only one which appears to us to be admissible, and the only one consistent with the language used by the patentee, and one which most effectually, probably, secures to him the product of his invention.”⁸⁹ Under that interpretation, Merrill claimed “a heavy hydrocarbon oil having the characteristics described in the patent, and produced by treating the oils in the manner described in the patent.”⁹⁰ Because the defendant in the case had not used oils that had been produced in the manner disclosed by Merrill, the infringement case failed.⁹¹

At the Supreme Court, Merrill’s attorneys chose to “disclaim” that claim interpretation.⁹² Both Merrill’s attorneys and the Court focused

86. *See id.*

87. *Ex parte* Parker, 1871 Dec. Comm’r Pat. 293, 294 (holding that a patent examiner was wrong to require the claims to include letters of reference to the drawings because it was a “fallacy” to believe that “by the use of these letters the scope of the claim can be more accurately defined than by the use of proper descriptive words”). The Commissioner also opined that the letters of reference were “for convenience merely, and in themselves have no significance.” *Id.* The Supreme Court’s subsequent decision in *Weir* would prove the Commission wrong on that final point. *See Weir v. Morden*, 125 U.S. 98, 108 (1888).

88. *Merrill v. Yeomans*, 17 F. Cas. 113, 116 (C.C.D. Mass. 1874) (No. 9,472).

89. *Id.*

90. *Id.*

91. *Id.* at 117.

92. *See Merrill v. Yeomans*, 94 U.S. 568, 571 (1876).

attention on the meaning of “manufacture,” but that framing of the case obscured a point of uncertainty that would persist for more than a century.⁹³

What modern attorneys would call a product-by-process claim would eventually be expressly blessed as “proper” by the Commissioner of Patents in the 1891 decision *Ex parte Painter*.⁹⁴ That decision concerned a patent claim in which “each clause claims an article qualified by the process of making it,” and the Commissioner considered the patent examiner’s objection to the claim as resting on the view that “a claim may never define an article of manufacture by any reference to the manner of making it.”⁹⁵ In rejecting the examiner’s position, the Commissioner reasoned that, although “*as a rule* a claim for an article of manufacture should not be defined by the process of producing that article,” there was an “exception to the rule” where an “article cannot be properly defined and discriminated from the prior art otherwise than by reference to the process of producing it.”⁹⁶

The Commissioner’s decision in *Painter* would eventually become a standard citation in court opinions and treatises for the propriety of product-by-process claims,⁹⁷ but four points highlight the degree to which the Commissioner of Patents was not leading the development of settled rules about claiming.

First, the *Painter* decision was actually overruling an earlier Commissioner decision that was not even 15 years old. The 1877 *Ex parte Cobb* decision had recognized the supposedly “invariable requirement of the Commissioner that from a claim for a new ‘article of manufacture’ there shall be eliminated all reference to the process” employed in making the article.⁹⁸ The 1891 *Painter* decision acknowledged this prior agency precedent (while avoiding actually citing the earlier decision) but disparaged the precedent on the ground that the judicial decisions cited by *Cobb* did not support any rule against defining a product by the process of making it.⁹⁹ *Cobb* and *Painter* together demonstrate the *unsettled* state of rules governing claiming.

Second, though left entirely unmentioned in the agency’s *Painter* decision, the Supreme Court’s 1877 decision in *Smith v. Goodyear*

93. *Id.* at 570–72.

94. 1891 Dec. Comm’r Pat. 200, 200.

95. *Id.*

96. *Id.* at 200–01.

97. See ELLIS, *supra* note 79, § 449 at 565 (citing *Painter* as the “earliest case” holding that a “product may be defined by its process of manufacture when there is no other satisfactory method of defining it”).

98. 1874 Dec. Comm’n Pat. 60, 60.

99. *Painter*, 1891 Dec. Comm’n Pat. at 200 (citing the two judicial precedents also cited in *Cobb*).

Dental Vulcanite Co. had squarely held that an invention could be defined as “a product or manufacture made in a defined manner.”¹⁰⁰ The claim at issue in *Smith* did not expressly include process terms. Rather, it was merely in the format of a specific product “substantially as described.”¹⁰¹ The *Smith* Court interpreted that “substantially as described” clause as implicitly limiting the claimed product to only a product produced using the process set for the patent specification. Yet if the Supreme Court could hold that the product claim without any express process limitations may be *implicitly* limited to a product produced by a specific process, there would seem to be no good reason why patent attorneys could not draft claims *expressly* claiming products produced by a process.

Third, the *Painter* decision began its analysis by relying on a *judicial* decision, although oddly enough that judicial decision was not the Supreme Court's earlier decision in *Smith v. Goodyear Dental Vulcanite*. Instead, *Painter* relied on the 1884 circuit court decision in *Globe Nail Co. v. U.S. Horse Nail Co.*, which had involved a claim to a nail that was defined by a series of process steps (e.g., “made by punching or cutting from hot-rolled ribbed bars of metal”) capable of “produc[ing] the peculiar qualities specified.”¹⁰² The Commissioner was not, however, relying on any holding of the court because, as the Commissioner's decision expressly notes, “no question was made but that it was a proper claim.”¹⁰³ In other words, the judges did not consider the propriety of the claim format because the attorneys for the defendant did not challenge it (quite possibly because they were aware of *Smith v. Goodyear Dental Vulcanite*). Thus, in relying on the form of the claim in *Globe Nail*, the Commissioner was relying not on the 1884 judicial decision in the case (because the judges were never presented arguments about the claim's format), but on (1) an 1869 decision of a private attorney to draft the claim in that format,¹⁰⁴ (2) the contemporaneous decision of an examiner to allow the claim in that

100. *Smith v. Goodyear Dental Vulcanite Co.*, 93 U.S. 486, 493 (1877).

101. *Id.* (quoting U.S. Pat. Re. 1,904 (1865)).

102. 19 F. 819, 820 (C.C.D. Mass. 1884). The complete claim, which was also set forth in the *Painter* decision, is:

A nail made by punching or cutting from hot-rolled ribbed bars of metal a headed blank, substantially as described, and by elongating, hardening, and compressing the shanks of such blanks by cold-rolling from the head to the point, thereby giving to all parts of the nail so produced the peculiar qualities specified.

Id.; see also *Ex parte Painter*, 1891 Dec. Comm'r Pat. at 200 (quoting the claim).

103. *Ex parte Painter*, 1891 Dec. Comm'r Pat. at 200.

104. See U.S. Patent No. 92,355 (filed July 6, 1869).

format, and (3) the litigation decision of the defendants in *Globe Nail* to forego challenging the format of the patent claim. In sum, patent lawyers were using the product-by-process claim format long before the Commissioner's 1891 decision to accept the format.

Fourth, the Commissioner's *Painter* decision did not, and could not, control how such a product-by-process claim would be interpreted in infringement litigation. For more than a century, two views percolated through the courts and commentators. The first and dominant view was that such a claim was infringed only if the accused product was proven as having been produced by the process mentioned in the claim.¹⁰⁵ An alternative view was that a product-by-process claim was every bit as broad as any other product claim and would be infringed by any product without regard to how it was produced.¹⁰⁶ Under that latter theory, the process elements in the product-by-process claim were merely intended to define the product in cases where the structural features of the product could not be determined given the limitations in the existing technology.

The historical conflict between those two views was finally resolved (or at least *apparently* so, assuming that the Supreme Court does not take up the issue) by an en banc decision of the Federal Circuit only in 2009¹⁰⁷—more than 130 years after the *Merrill* decision and more than a century after the Commissioner's decision formally ratifying product-by-process claims! The en banc decision embraced the view described above as the first and dominant view, but in doing so, it had to expressly overrule a 1991 panel decision applying the alternative view.¹⁰⁸ The en banc court was also not unanimous, with three of the longest-tenured judges on the court dissenting.¹⁰⁹

In sum, the deep uncertainty surrounding the very claim format used in *Merrill*—and the survival of that uncertainty for more than a

105. *See, e.g.*, *Smith v. Goodyear Dental Vulcanite Co.*, 93 U.S. 486, 493 (1877); *Atlantic Thermoplastics Co., Inc. v. Faytex Corp.*, 970 F.2d 834, 842 (Fed. Cir. 1992) (describing a line of cases holding that product-by-process claims inquiries focus “on whether the accused product was made by the claimed process”).

106. *See, e.g.*, *Scripps Clinic & Rsch. Found. v. Genentech, Inc.*, 927 F.2d 1565, 1583 (Fed. Cir. 1991) (“[T]he correct reading of product-by-process claims is that they are not limited to product prepared by the process set forth in the claims.”).

107. *Abbott Laboratories v. Sandoz, Inc.*, 566 F.3d 1282 (Fed. Cir. 2009) (en banc).

108. *Id.* at 1293 (embracing the rule “that the process terms limit product-by-process claims” in infringement analyses and “expressly overrul[ing]” *Scripps Clinic & Rsch. Found. v. Genentech, Inc.*, 927 F.2d 1565 (Fed. Cir. 1991)).

109. *See id.* at 1299 (Newman, J., joined by Mayer & Lourie, JJ., dissenting). At the time, Judges Newman and Mayer were the longest tenured judges on the court, and Judge Lourie was the fifth most senior judge.

century after the case—gives lie to Supreme Court’s assertion that patent law in 1877 had developed sufficiently “well-settled” rules that the patentee’s alternative interpretation of the patent claim could be as easily discounted as the Court had done.¹¹⁰ This point is easy for modern commentators to overlook. For example, the claim in *Merrill* is used as an example in an article by Professors Chiang and Solum, who assert that “[o]nce read in context, it becomes quite clear that the word ‘manufacture’ in the claim refers to a process and not a product.”¹¹¹ In addition to context, they rely on the application of “some ordinary rules of grammar” to argue:

A sentence that read, “I claim the above described new manufacture of the deodorized heavy hydrocarbon oils . . . *from* [untreated] hydrocarbon oils, *by treating* them substantially as is hereinbefore described,” would make no grammatical sense if “manufacture” was being used to denote a product. By considering the surrounding context and applying some ordinary rules of grammar, we can arrive at the correct linguistic meaning.¹¹²

Is this really so? Do the rules of grammar quite clearly dictate such a meaning? There are three reasons to doubt that assertion.

First, the trial judge in the case wrote a considered opinion in which he came to the opposite conclusion—that the claim covered a product not just a process—and he thought that conclusion was “the only one which appears to us to be admissible.”¹¹³ It is true that the trial judge believed that the claim covered only the product when produced by a particular process, so that the end result was the same (the infringement case failed). Yet still his “only . . . admissible” was quite different from the the “quite clear” linguistic meaning posited by Chiang and Solum.

Second, Chiang and Solum do not cite any source for the “ordinary rules of grammar” supporting their interpretation, and it’s unlikely that any standard or widely used books of grammar available to sophisticated lawyers and judges contain grammatical rules detailed enough to resolve the issue whether “manufacture,” in its meaning as a product, can properly be modified by the clauses “from hydrocarbon oils” and “by treating them” Indeed, it seems doubtful that such any such rule of grammar exists. The word “manufacture” is similar to a number of similar words such as building, creation, fabrication, preparation,

110. See *Merrill v. Yeomans*, 94 US. 568, 573 (1877).

111. Tun-Jen Chiang & Lawrence B. Solum, *The Interpretation-Construction Distinction in Patent Law*, 123 YALE L.J. 530, 550 (2013).

112. *Id.* (alteration in original) (quoting *Merrill v. Yeomans*, 94 U.S. 568, 570 (1876)).

113. *Merrill v. Yeomans*, 17 F. Cas. 113, 116 (C.C.D. Mass. 1874) (No. 9,472).

assembly, etc., each of which can mean the process of making a thing or the thing produced. Now consider this sentence:

I claim the assembly of a beautiful puzzle, suitable for framing,
from one hundred parts, by piecing them together.

The object of that sentence could mean the process of assembly, but it can also refer to the finished product without violating any rules of grammar. To see this, add the adjective “completed” to the sentence so that it reads:

I claim the completed assembly of a beautiful puzzle, suitable for
framing, from one hundred parts, by piecing them together.

The adjective “completed” resolves of the ambiguity so that the object is now clearly the product, but the sentence is still grammatically correct.

Third, even where a particular claim has linguistic certainty, that certainty is not legally dispositive. The text of the relevant statute defines infringement as the unauthorized making, using, offering for sale, etc., of the “patented invention.”¹¹⁴ Nothing in that statute, or in the other general statutes governing the cause of action for infringement,¹¹⁵ state that “the patented invention” is defined exclusively by the claims. The case law confirms the contrary is true: defendants may infringe the patented invention even though they avoid the literal meaning of the claims¹¹⁶ and, conversely, may not infringe even though they act within the literal meaning of the claims.¹¹⁷ Thus, complete certainty in claiming—which was present neither in the time of *Merrill* nor in the present time—would not bring certainty in defining patent property rights.

114. 35 U.S.C. § 271(a) (2018). Chiang & Solum describe the schism between judges who pursue “the linguistic meaning of claim text” and those who seek “the true invention” as part of the “age-old conflict between textualism and anti-textualism.” Chiang & Solum, *supra* note 111, at 573. Yet in the context of an infringement case, judges who seek to find the “patented invention,” rather than the linguistic meaning of claim text, may be the real textualists because they are following the commands of § 271.

115. 35 U.S.C. §§ 281–82 (2018).

116. *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 17–18 (1997) (holding a patent may be infringed under the doctrine of equivalents even when defendant’s activities avoid the literal language of the claims).

117. *Westinghouse v. Boyden Power Brake Co.*, 170 U.S. 537, 568 (1898) (holding that the patentee cannot hold the defendant liable for infringement even where the defendant has acted “within the letter” of the patent claims, if the defendant “has so far changed the principle of the device that the claims of the patent, literally construed, have ceased to represent [the patentee’s] actual invention”).

III. A CONTEMPORANEOUS SOLUTION TO UNCERTAINTY: THE MULTIPLICITY OF CLAIMS.

Given the lack of settled rules for claiming, one of the most important decisions of the Patent Office was to allow a multiplicity of claims so that inventors' attorneys could experiment with different claiming formats. That decision came in *Ex parte Perry & Lay*,¹¹⁸ which was rendered the same year, 1869, that Merrill received his patent. It was one of the earliest recorded decisions of the Commissioner of Patents (it was the second decision reported in the first volume of the series "Decisions of the Commissioner of Patents," which would eventually span one century of volumes). The Commissioner there considered whether the seventh claim in an application for a reissued patent was properly "disallowed on the ground that it was substantially embraced in the first claim."¹¹⁹ The Commissioner ruled that the ground "does not appear to me to be a valid objection" because "[i]t is admissible, upon proper restrictions, for parties to put their claims in different forms to prevent misconstructions of them by the public or by the courts."¹²⁰

The reissue patent for Perry and Lay, which covered an improved marine reciprocating steam engine, issued on March 30, 1869, less than three months after the Commissioner's decision.¹²¹ It contained seven claims, each set forth in a quite different format. Three of the seven claims seem equivalent to what a modern patent lawyer would call "dependent claims." Each of those three begins with the word "Also," and each provides additional details, elements and limitations relevant to a preceding claim.¹²² The four "independent" claims (claims 1, 2, 4 & 7) claim the invention in varying formats. Claim 1 is set forth in a strikingly modern format, with a preamble naming the invention ("A vertical compound-engine") followed by a transition word ("having") and then followed by various elements (cylinders, a continuous piston-rod, etc.) and the interrelations of those elements.¹²³ Claims 2 and 4 are set forth in two variants of the now antiquated "combination" format,

118. *Ex parte Perry & Lay*, 1869 Dec. Comm'r Pat. 3.

119. *Id.* at 3.

120. *Id.*

121. See U.S. Patent No. 65,003, at 1 (issued Mar. 30, 1869) (entitling the patent "Improvement in Reciprocating Steam-Engines" and specifying in the patent's first sentence that the invention involves "Marine Steam-Engines").

122. See *id.* at 2 (claims 3, 5 & 6). Claim 3 seems to qualify claim 2 by adding two new elements—a "sleeve" and a "packing-box"—and specifying the relation of those new elements to the engine cylinders introduced in claim 2. *Id.* Claims 5 and 6 similarly qualify the independent claim 4. *Id.*

123. *Id.*

with claim 2 structured as “[t]he combination and arrangement of [one element] with [other elements],” and claim 4 structured as “[i]n combination with [several elements], the [additional element].”¹²⁴ Claim 7 specifies only the “sustaining part,” which appears to be the chief innovation in the patent, and then details that single part’s relationship with the other parts (e.g., the “the two cylinders” and the “piston-rod”) of a “marine engine.”¹²⁵

By modern standards, the reissue patent to Perry and Lay had a very modest number of claims, but in 1869, the inclusion of seven claims was on the high side for number of claims in a patent. Many patents still concluded with only a single claim.¹²⁶ The Patent Office’s then-existing rule pamphlet provided exemplary applications for only two inventions, each of which had only one claim.¹²⁷ Indeed, in describing its example for a patent on a machine, the Patent Office pamphlet stated that the specification should conclude with “the claim,” in the singular.¹²⁸ One rule only suggested that multiple claims were permissible. That rule generally provided that “[t]wo or more distinct and separate inventions may not be claimed in one application,” but it provided an exception that “where several inventions have a necessary and dependent connection with each other, so that all co-operate in attaining the end which is sought, they may be so claimed.”¹²⁹ That rule did not, however, authorize either expressly or by implication that applicants could write redundant claims in differing formats.

Of course, sophisticated practitioners would have been aware that the Supreme Court in *O’Reilly v. Morse* had sustained seven of Morse’s eight claims, so there was obviously no per se bar to multiple claims.¹³⁰ Similarly, the 1837 statute justifying the *O’Reilly* Court’s decision to refuse to award Morse costs at least arguably contemplated multiple claims, although the statute was not worded as its modern descendant is. The modern version of the statute denying costs for infringement

124. *Id.* at 2.

125. *Id.*

126. For examples of single-claim patents issued on the very same day as the Perry & Lay reissued patent, see, for example, U.S. Patent No. 88,431, at 2 (filed Mar. 30, 1869); U.S. Patent No. 88,494, at 1 (filed Mar. 30, 1869); U.S. Patent No. 88,369, at 1 (filed Mar. 30, 1869); U.S. Patent No. 88,370, at 1 (filed Mar. 30, 1869).

127. 1867 PATENT RULES, *supra* note 33, at 10–11. The rules provided one complete example of an application covering a process, which ended with one claim. The other example, which was directed to a machine invention, merely described in words how the application should be written.

128. *Id.* at 11.

129. *Id.* at 10.

130. 56 U.S. (15 How.) 62, 121–22 (1853).

plaintiffs, 35 U.S.C. § 288, is entitled “Action for infringement of a patent containing an invalid claim,” and its text plainly contemplates patents having multiple claims.¹³¹ The equivalent 1837 statute denied victorious plaintiffs costs if they failed to file “a disclaimer of all *that part of the thing patented* which was so claimed without right.”¹³² The phrasing of that statute could have been interpreted as permitting the disclaimer of a “part” rather than of a distinct claim among a multiplicity of claims. It was not until the Patent Act of 1870 that statutory law expressly contemplated multiple claims in a single patent.¹³³

The lawyers for Perry and Lay were obviously very good at their craft, for not only were they creative enough to write repetitive claims in different formats (and appeal a rejection when lower level officials tried to stop them from doing so), they also claimed the invention in quite different formats—one format that continues to thrive today (claim 1), another format that was used for decades before falling out of favor in the twentieth century (the combination format of claims 2 and 4), and one format that was used in the mid-nineteenth century but seems to have lost popularity rather quickly (claim 7, which focused specifically on the innovative piece of the whole engine).

The Commissioner’s decision in *Perry & Lay*—albeit very short—also points out the most important reason for permitting redundant claims: the different formats provides insurance against “misconstructions of them . . . by the courts.”¹³⁴ The decision, however, did not give attorneys carte blanche to multiply claims, as it allowed redundant claims only with “proper restrictions.”¹³⁵ In the decades following that decision, the Patent Office, the courts, and the practicing bar would struggle to find the correct balance between providing freedom for attorneys to write claims in creative ways and imposing “proper restrictions” on excessively numerous claims.

131. 35 U.S.C. § 288 (2018) (forbidding the awarding of costs to a plaintiff that prevails on an action for “infringement of a claim of the patent . . . unless a disclaimer of the invalid claim has been entered at the Patent and Trademark Office before the commencement of the suit”). Many other provisions of the modern Patent Act expressly contemplate multiple claims. 35 U.S.C. § 112(b) (2018) (providing that the specification “shall conclude with one or more claims”); 35 U.S.C. § 282(a) (2018) (providing that “[e]ach claim of a patent . . . shall be presumed valid independently of the validity of other claims”).

132. Act of March 3, 1837, ch. 45, § 9, 5 Stat. 191, 194 (emphasis added).

133. See Act of July 8, 1870, ch. 230, § 46, 16 Stat. 198, 204–05 (permitting appeals for any of the “claims” twice rejected during examination).

134. *Ex parte Perry & Lay*, 1869 Dec. Comm’r Pat. 3.

135. *Id.*

Later in the same year as the *Perry & Lay* decision, the Commissioner rendered a decision placing one limit on including multiple claims in a single patent, but it was a very modest limit. In *Ex parte Yale*, the Commissioner ruled that the applicant could not place three claims into the same patent application where two were directed to a new mailbox and the third was directed to the lock on the box.¹³⁶ As the Commissioner expressly stated, however, the rule was not designed to limit the number of potential claims but merely to prevent applicants from including “many inventions in one patent [so as to] deprive the Government of its proper fees.”¹³⁷ The result was merely to require a division of the application, and the payment of an additional filing fee (\$15 at the time).¹³⁸

Four years after the Commissioner’s decision in *Perry & Lay*, the Supreme Court in *Carlton v. Bokee* considered a reissued patent in which “[t]he single claim of the original patent is expanded into seven distinct claims.”¹³⁹ The *Carlton* Court seemed to condemn the “needless multiplication” of claims in its statement that, “where a specification by ambiguity and a *needless multiplication* of nebulous claims is calculated to deceive and mislead the public, the patent is void.”¹⁴⁰ But the statement was not a strong prohibition on patents having numerous claims. The Court’s wrath extended only to “needless” multiplication of “nebulous” claims that were “calculated to deceive and mislead,” and in that case, the Court found that the patentee had used the reissue process by “intersperse[ing]” within the patent’s original specification material that was “evidently borrowed from subsequent experience and events.”¹⁴¹ Indeed, the Court expressly stated that it was *not* deciding whether “a repetition of substantially the same claim in different words will vitiate a patent.”¹⁴²

Courts and commentators continued to condemn the presence of seemingly excessive claims in patents, but the practice grew. In a 1916 opinion, the Second Circuit adopted as its own an opinion by then-District Judge Learned Hand, who condemned a patent containing 48 claims as “violat[ing] the very purpose of any claims at all, which is to

136. *Ex parte* Linus Yale, Jr., 1869 Dec. Comm’r Pat. 110.

137. *Id.* at 111.

138. *Id.* The Commissioner reminded readers that this fee was “a very reasonable charge” and that generally the U.S. fees for all services of the Patent Office “are less than are charged in any other country, while the service performed for the applicant by the office is much greater.” *Id.*

139. 84 U.S. 463, 471 (1873).

140. *Id.* at 472 (emphasis added).

141. *Id.* at 471.

142. *Id.* at 472.

define the forbidden field.”¹⁴³ That statement was, however, dicta, as the court found the two claims asserted from the patent to be not infringed by the defendant’s product.¹⁴⁴ Similarly, a 1922 treatise described a patent containing 277 claims as “a very close approach to the ridiculous” and opined that some reform was needed for “this gross abuse of practise to be consigned to oblivion.”¹⁴⁵ Yet even that treatise writer recognized from his own practice experience the need for “claims of many kinds to protect adequately inventions” involving “modern complicated machinery.”¹⁴⁶ Dissenting in a 1942 decision, Justice Black, joined by Justices Douglas and Murphy, thought the Court’s statements in *Carlton* justified voiding a patent containing 137 claims with more words devoted to the claims (14,000) than to the whole rest of the patent (11,000).¹⁴⁷ Nevertheless, the result in the case was that the Court majority held valid and infringed all five claims (out of the 137) that had been asserted by the patentee.¹⁴⁸

By 1949, the mid-twentieth century’s leading treatise writer on patent claiming—Ridsdale Ellis—would note that, despite occasional judicial condemnations of patents with a large number of claims, “there are numerous cases of patents containing substantially duplicate claims being upheld without criticism or injuriously restricted interpre-

143. *Victor Talking Mach. v. Thomas A. Edison, Inc.*, 229 F. 999, 1001 (2d Cir. 1916) (setting forth the district court opinion as the basis for affirmance).

144. *Id.*

145. JOHN F. ROBB, PATENT ESSENTIALS FOR THE EXECUTIVE, ENGINEER, LAWYER AND INVENTOR 201–02 (1922). The patent singled out in the treatise was U.S. Patent No. 1,043,882 (issued Nov. 12, 1912), which has less than seven pages of specification prior to the thirty-nine pages devoted to the 277 claims. Almost all of the claims are written in the “combination” format, with the first words in the claim being either “In a machine of the character described, the combination with . . .” or “the combination of . . .,” but a few claims are drafted in slightly different formats. *Id.* at 201; see U.S. Patent No. 1,043,882 (issued Nov. 12, 1912).

146. ROBB, *supra* note 145, at 207. The Robb treatise also believed that attorneys were multiplying claims excessively because they were “too fearful of failing to cover the invention properly” and were not “giv[ing] due weight to the fact that the courts exist to give effect to the protection of the patent for all real invention present.” *Id.* at 201–202. Yet, as *Merrill* and many other cases show, the courts do not always protect “all real invention present”—nor should they. If claims have some role—any role—in defining property rights, then courts must be willing at some point to restrict the scope of patent rights based on the claims even if real invention is described elsewhere in the patent.

147. *Williams Co. v. United Shoe Mach. Corp.*, 316 U.S. 364, 371–82 (1942) (Black, J., joined by Douglas & Murphy, JJ., dissenting).

148. *Id.* at 371.

tations.”¹⁴⁹ Subsequent history suggests an even more permissive attitude to patents with numerous claims.

The current acceptance of large numbers of claims seems puzzling at first. Learned Hand is right (as he usually is) that numerosity in claiming undermines the function of claims, which are supposed to define the boundaries of intellectual property rights. Property deeds do not contain dozens or hundreds of metes and bounds, each set of which may or may not provide the correct demarcation of the property rights. Why does our legal system tolerate such complexity and imprecision in patent law? The answer here turns on the inherent difficulty in developing the law defining patent right boundaries. As the practice of defining boundaries has developed in a decentralized fashion, it necessarily develops incrementally, and in fits and starts. There are wrong turns, abandoned experiments, and general uncertainty about the permissible style and substance of proper patent boundaries. In such an environment—one inherently lacking the “settled rules” that the *Merrill* Court mistakenly perceived 140 years ago—tolerating numerous claims has value in permitting continued experimentation, and continued progress, in the law of claiming.

CONCLUSION: MATCHING PATENT RIGHTS TO WHAT WAS “REALLY INVENTED”

I conclude with a confession. This essay started out with a tentative title something like “The Patent Office’s Leadership in Developing the Claiming of Patent Rights.” The essay was going to trace the development of modern claiming practices through the guiding administrative decisions of the Patent Office, but that essay could not be written because the tentative thesis turned out to be not true. The development of modern claiming practices is a much more complicated story in which practicing lawyers first and foremost developed claiming styles, and the agency and courts slowly reacted to those styles. Now-standard practices grew slowly and fitfully, and significant areas of uncertainty persisted through many decades. Indeed, many uncertainties survive to this day.

The leaderless development of claiming practices may help to explain why lawyers sought greater numbers of claims. Several different formats for claiming the same type of invention continued to exist in parallel for decades, and attorneys could not be certain how those claims would be viewed by courts in the future. Multiplying claims was a pragmatic solution to the uncertainty, and despite some prominent complaints about excessive numbers of claims, the agency and the courts largely let patent attorneys have their fill of claims.

This history also raises the larger point that courts should avoid overestimating the degree to which patent law has sufficiently well-

149. ELLIS, *supra* note 79, § 158, at 191.

settled rules of claiming so that claims can achieve precision in defining property rights. Two subsidiary points follow, both of which are evident in *Merrill*.

First, courts should avoid using hindsight in construing patent claims. The problem of hindsight in patent law is frequently raised as a warning to courts against overestimating what would have been “obvious” to a person of skill in the relevant technological art in an earlier time period.¹⁵⁰ Yet the problem can equally arise in adjudicating the scope and meaning of patent claims, with hindsight overestimations of what would have been clear in the legal art of writing claims at the time the claims were written.

The history of the underlying patent in *Merrill* provides an excellent example. Despite the Supreme Court’s positing of “well-settled rules” in the patent system of 1877, the rules concerning claiming a composition of matter were so unsettled when the patent was granted in 1869 that even the Patent Office’s own model specification and claim for a composition of matter contained flaws highly similar to the ones identified by the Court in *Merrill* as foreclosing any reading of the claim to cover a product rather than a process. Identifying the meaning of a patent claim once it has been issued is an inherently backward-looking exercise because the claim is written at an earlier time in light of the then-existing legal conventions and technological knowledge. Courts interpreting patent claims and deciding the extent of patent rights have to be wary of hindsight bias every bit as much as they do in deciding patent validity issues such as obviousness.

Second, and perhaps most importantly, courts construing the extent of patent rights should always be attentive to—in the *Merrill* Court’s words—“that which was really invented.”¹⁵¹ *Merrill* is rightly famous for elevating the importance of claims in defining patent rights, but the case should be equally famous for continuing the tradition of construing claims in light of the technological contribution of the inventor. Linguistics alone will not do; nor will the often unsettled and fluid rules of patent claiming. The one truly settled rule—the only rule identified as a “rule” by *Merrill*—is that courts should try, if fairly possible, to match the scope of patent rights to what was “really invented.”

150. See, e.g., *KSR v. Teleflex*, 550 U.S. 398, 421 (2007) (instructing that courts must be aware of the “distortion caused by hindsight bias” and “be cautious of arguments reliant on *ex post* reasoning”). See also *Zoltec Corp. v. United States*, 815 F.3d 1302, 1313 (Fed. Cir. 2016) (collecting precedents on the unreliability of “[h]indsight reconstruction for litigation ends”).

151. *Merrill*, 94 U.S. at 573.