

**“INVENTORLESS” INVENTIONS? THE CONSTITUTIONAL
CONUNDRUM OF AI-PRODUCED INVENTIONS**

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ABSTRACT

The U.S. Patent and Trademark Office recently held that inventions created by artificial intelligence (AI) are not patentable in the name of the AI system. This decision has weighty implications and reveals major underlying problems with the patent laws.

This Article’s primary contribution is to address whether, under the Intellectual Property Clause of the Constitution, Congress has the authority to issue patents on AI-produced inventions. In answering this question, this Article analyzes the Intellectual Property Clause in light of the multiple modalities of constitutional argument. Textual analysis suggests that the original constitutional meaning of “Inventors” supports a broad conception of “Inventors” that is compatible with patenting AI-produced inventions. The history is consistent with this understanding, based in part on the English practice of granting “patents of importation.” Ultimately, the Article concludes that, although an AI cannot be an inventor for constitutional purposes, the constitutional scope of inventorship is not limited solely to the literal creator of a claimed invention. Rather, Congress possesses broad authority under the Intellectual Property Clause to define “Inventors” for purposes of patent law. Consequently, Congress can authorize the issuance of patents on AI-produced inventions to various natural persons bearing some relationship to the AI system, even when those individuals have little to no role in the AI’s inventive process.

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I. INTRODUCTION

In July 2019, computer scientist Stephen Thaler sought two patents from the United States Patent and Trademark Office (“USPTO”).¹ The first was for an adjustable, interlocking “fractal” food container designed to be easy for an automated system to carry and transport.² The second was for the “neural flame,” an impossible-to-ignore flashing emergency beacon. In responding to Thaler’s neural flame application, the USPTO gave no hint that the invention failed to satisfy the standard

1. Todd Feathers, *This Guy Is Suing the Patent Office for Deciding an AI Can’t Invent Things*, VICE: MOTHERBOARD (Aug. 24, 2020, 9:00 AM), <https://www.vice.com/en/article/5dz44b/this-guy-is-suing-the-patent-office-for-deciding-ai-cant-invent-things> [https://perma.cc/3386-B5U2].

2. Mark White, *AI Should Be Recognised as “Inventor” of New Container Product, Say Academics*, TOP BUS. TECH (Aug. 19, 2019), <https://tbtech.co/ai-recognised-inventor-new-container-product-academics/> [https://perma.cc/XG4S-DP94].

patentability criteria, such as utility, novelty, and nonobviousness.³ Nor was there any doubt that the invention fell comfortably within the bounds of ordinarily patentable subject matter.⁴ Nonetheless, the USPTO denied Thaler’s application. How did that happen? The problem was in the paperwork.

Under USPTO procedures, each patent application must include an application data sheet that lists the inventor or coinventors of the claimed invention⁵ as well as an oath or declaration certifying that the applicant or applicants were the first to invent the claimed invention.⁶ Straightforward enough. But Thaler’s struggle was that he did not list his name on either the data sheet or the oath — nor did he intend to do so.⁷ Instead Thaler listed DABUS — an artificial intelligence (“AI”) system of his own creation — as the inventor.⁸

Artificial intelligence⁹ has become nearly ubiquitous in modern society. Today, AI systems power self-driving cars and assist with diagnosing medical conditions.¹⁰ In the marketplace, retailers and streaming services use AI to create tailored recommendations for customers, and — to the irritation of many — to engage in targeted advertising.¹¹ More seriously, AI systems have been used during the COVID-19 crisis “in drug development, analysing and learning from large data sets to identify . . . new treatments.”¹² AI usage has even found its way into the legal profession. For instance, “legal research services such as CARA, Clerk, EVA, and vLex” can now analyze legal

3. See 35 U.S.C. §§ 101 (requiring utility), 102 (requiring novelty), 103 (requiring nonobviousness).

4. Both inventions could be characterized as machines or manufactures. See *id.* § 101 (providing that “[w]hoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement therefor, may obtain a patent therefor, subject to the conditions and requirements of this title”).

5. See 37 C.F.R. § 1.76(a), (b)(1) (providing that patent applications must include a data sheet listing bibliographic information, including the “legal name, residence, and mailing address” of the inventor or each joint inventor).

6. 35 U.S.C. § 115(a).

7. *In re* Application of Application No.: 16/524,350, 2020 Dec. Comm’r Pat. 2–3 (Apr. 22, 2020) [hereinafter USPTO, *Thaler Decision*].

8. *Id.* at 2.

9. Although there are many ways to define artificial intelligence, for purposes of this Article, this simple definition suffices: “AI . . . refers to computers learning how to complete tasks traditionally done by humans.” Julie Sobowale, *How Artificial Intelligence is Transforming the Legal Profession*, ABA J. (Apr. 1, 2016, 12:10 AM), https://www.abajournal.com/magazine/article/how_artificial_intelligence_is_transforming_the_legal_profession [<https://perma.cc/Y843-GL5E>].

10. Richard Summerfield, *AI and Productivity*, FINANCIER WORLDWIDE MAG. (May 2021), <https://www.financierworldwide.com/ai-and-productivity#.YHtNt-831b9> [<https://perma.cc/33Z5-3R6B>].

11. David E. Chamberlain & Timothy B. Poteet, *Artificial Intelligence and the Practice of Law or Can a Computer Think Like a Lawyer?*, 25 STATE BAR TEX. 8TH ANN. BUS. DISPS. 1, 3 (2016).

12. Summerfield, *supra* note 10.

briefs, considering “factors such as the procedural posture of the case, the pattern of citations, and even which citations may be missing” in order to evaluate the “strengths or weaknesses of a brief or pleading.”¹³ Some of these uses are admittedly modest, but the AI industry will only continue to expand: Corporate spending on AI systems is predicted to “grow from \$37.5 billion in 2019 to nearly \$98 billion in 2023.”¹⁴ Consequently, AI is poised to become “profoundly disruptive” across a wide range of industries.¹⁵ And this capacity for disruption recently crash-landed in the realm of patent law.

DABUS (“Device for the autonomous bootstrapping of unified sentence”),¹⁶ which Thaler designed, is a “creativity engine” allegedly capable of advanced problem-solving and invention without the need for specialized training or human input.¹⁷ Using its system of neural networks,¹⁸ DABUS purportedly produced both the inventions Thaler filed for without Thaler’s assistance.¹⁹ Indeed, Thaler indicated in the neural flame patent application that “it was the machine, not a person, which recognized the novelty and salience of the . . . invention.”²⁰

13. Bob Lambrechts, *May It Please the Algorithm*, 89 J. KAN. BAR ASS’N 36, 40 (Jan. 2020).

14. *Id.* at 38.

15. Summerfield, *supra* note 10.

16. Yogini Bhavsar-Jog, *Artificial Intelligence as an Inventor on Patents – The Global Divide and the Path Forward*, JD SUPRA (Dec. 22, 2021), <https://www.jdsupra.com/legalnews/artificial-intelligence-as-an-inventor-7892764/#> [<https://perma.cc/A2BJ-32LK>].

17. Bhavsar-Jog, *supra* note 16; Feathers, *supra* note 1.

18. For a thorough explanation of what neural networks are and how they work, see generally Larry Hardesty, *Explained: Neural Networks*, MIT NEWS (April 14, 2017), <https://news.mit.edu/2017/explained-neural-networks-deep-learning-0414> [<https://perma.cc/WN8R-X3KB>]. In short, neural networks allow computers to “learn[] to perform some task by analyzing training samples” which are manually labeled by those training the AI system. *Id.* The computer tries to tag the training samples with the correct label and automatically adjusts its programming in response to feedback to obtain better levels of accuracy on subsequent attempts. *Id.* Essentially, neural networks “guess” at the correct label and then, having received feedback on the accuracy of the guess, reprogram themselves to make more accurate assessments in the future.

19. *See* Bhavsar-Jog, *supra* note 16; Feathers, *supra* note 1.

20. USPTO, *Thaler Decision*, *supra* note 7, at 4. We should note from the outset, however, that regardless of what Thaler might contend to the contrary, this Article assumes that AI systems are not intelligent in any meaningful sense. Instead, we see AI systems as advanced computational tools that raise important questions regarding the quantity and quality of human involvement in the inventive process necessary to obtain a claim to inventorship. *See* Dan L. Burk, *AI Patents and the Self-Assembling Machine*, 105 MINN. L. REV. HEADNOTES 301, 303 (2021) (“[A]rtificial intelligence’ is something of a misnomer. What is now being touted as ‘AI’ is almost entirely, and perhaps altogether entirely, systems implementing machine learning routines. Such systems are not intelligent in any robust sense of the word . . .”). In other words, we assume that Thaler did nothing more extensive in producing these inventions than hitting “start” on DABUS and then identifying the useful items among the system’s outputs after the fact.

Thaler’s assertions were not enough, however, for the USPTO. As the USPTO saw it,²¹ United States patent law requires that an inventor be a natural person. It pointed first to the text of the Patent Act, which defines an inventor as “the individual or, if a joint invention, the individuals collectively who invented or discovered the subject matter of the invention.”²² The USPTO reasoned that the use of “individual” and other human pronouns throughout the Patent Act precluded giving the term “inventor” the broad scope necessary to encompass the concept of machine-as-inventor.²³

The USPTO also looked beyond the plain text of the Patent Act to consider various persuasive authorities. For instance, it referenced decisions from the federal courts in analogous contexts, such as a United States Court of Appeals for the Federal Circuit decision concluding that a state could not be an inventor because it lacked the capacity for “conception,”²⁴ and a second decision concluding that a corporation, while capable of owning an invention, could not itself be an inventor.²⁵ In the same vein, the USPTO pointed to numerous provisions in the Code of Federal Regulations that refer to inventors as “person[s]” and to its own Manual of Patent Examining Procedures, which identifies as a threshold requirement for inventorship the same mental act of “conception” identified in the earlier Federal Circuit decisions.²⁶

Having reviewed these sources of authority, the USPTO concluded that Thaler’s application did not satisfy the formal requirement that the inventor make an oath or declaration that he or she is the true inventor,

21. To challenge the patent examiner’s determination that DABUS could not be listed as the inventor, Thaler filed a petition under 37 C.F.R. § 1.181, which allows certain administrative decisions to be appealed to the Director of the Patent Office. See USPTO, *Thaler Decision*, *supra* note 7, at 1. For a detailed explanation of the procedures for such a petition, see generally Victor Cardona & James Villaneuva, *Going Over a PTO Examiner’s Head: What Happens if You Don’t Like a Decision by a Patent Office Examiner?*, HRFM TODAY (June 6, 2014, 12:11 PM), <https://www.hrfmtoday.com/2014/06/going-over-a-pto-examiners-head-what-happens-if-you-dont-like-a-decision-by-a-patent-office-examiner.html> [https://perma.cc/3UH7-GEQT].

22. USPTO, *Thaler Decision*, *supra* note 7, at 4 (quoting 35 U.S.C. § 100(f)).

23. For instance, “[w]hoever” in 35 U.S.C. § 101 and “himself” and “herself” in 35 U.S.C. § 115(b)(2). *Id.*

24. *Id.* at 4–5 (citing *Univ. of Utah v. Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V.*, 734 F.3d 1315, 1323 (Fed. Cir. 2013)). Courts treat conception as an essential requirement for patentability. This “touchstone of inventorship” entails “formation in the mind of the inventor, of a definite and permanent idea of the complete and operative invention, as it is hereafter to be applied in practice.” *Burroughs Wellcome Co. v. Barr Lab’ys, Inc.*, 40 F.3d 1223, 1227–28 (Fed. Cir. 1994). Thus, “[c]onception is complete only when the idea is so clearly defined in the inventor’s mind that only ordinary skill would be necessary to reduce the invention to practice, without extensive research or experimentation.” *Id.* at 1228.

25. USPTO, *Thaler Decision*, *supra* note 7, at 5 (citing *Beech Aircraft Corp. v. EDO Corp.*, 990 F.2d 1237, 1248 (Fed. Cir. 1993)).

26. *Id.* at 5–6.

thus precluding the issuance of a patent on either invention.²⁷ This outcome left Thaler in an awkward position: He believed that under the Patent Act, he could not rightfully claim to be the inventor of either invention, presumably because he had not satisfied the conception requirement.²⁸ Worse still, because “naming an incorrect inventor is grounds for rejecti[ng]” a patent application,²⁹ the USPTO’s decision effectively rendered DABUS’s inventions unpatentable; as a statutory matter, DABUS could not be the inventor, yet no natural person could rightfully claim to be the inventor either.

This decision has weighty implications and reveals major underlying problems with the patent laws. As things stand, AI-produced inventions appear to be, as a matter of law, unpatentable.³⁰ Given the influence that AI has come to have in wide-ranging industries, the USPTO’s conclusion, if left untouched, might soon leave large swaths of inventive activity in the United States outside the grasp of patent law and the traditional economic arrangements that patents encourage. An important question, then, is whether this state of affairs is inevitable.

This Article is the first to fully consider whether, from a constitutional perspective, Congress can authorize a result that the USPTO, when facing DABUS, felt it could not permit as a statutory matter. Contrary to conventional wisdom, we conclude that, although the Constitution does not permit an AI system to be deemed an inventor, it does allow Congress to bestow the mantle of inventorship of AI-produced inventions onto various natural persons. We reach this conclusion by applying the classic modalities of constitutional argument to interpret the scope of the Intellectual Property Clause. The Article proceeds in six Parts.

Part II briefly assesses whether, as the USPTO concluded, the current Patent Act precludes issuing a patent in the name of the AI system (as opposed to a human in some way involved with the inventive

27. *Id.* at 6.

28. As the USPTO acknowledged in its decision on Thaler’s petition, “[i]dentifying a natural person, who did not invent or discover the subject matter of the invention, as the inventor in a patent application would be in conflict with the patent statutes.” *Id.* at 6. Conception, “the threshold question for inventorship,” is defined as “the complete performance of the mental part of the inventive act,” which is “the formation in the mind of the inventor of a definite and permanent idea of the complete and operative invention.” *Id.* at 5–6 (citing MPEP § 2138.04 (8th ed. Rev. 7, Sept. 2008)).

29. *Id.* at 7.

30. Note, however, that patent scholar Dan Burk holds a contrary view, reasoning that inventions resulting from the workings of an AI system are no less patentable than those resulting from biotechnological processes such as those used to produce monoclonal antibodies. Burk, *supra* note 20, at 304. Such technologies yield inventive outputs (such as novel antibodies) that are unpredictable *ex ante*, meaning that the person deemed the inventor is often the individual who recognizes the value of the output after the fact, despite having had no idea in advance what the precise result of the process might be. *Id.* at 305 (“[T]hose of skill in the art were able to identify [inventions] with the proper characteristics once they were produced, and their emergentivity was never considered an impediment to patenting.”).

process). That assessment is important because Thaler has appealed the USPTO’s determination in federal court.³¹ This Part concludes that the Patent Act as written prohibits issuing a patent in the name of an AI system. And, as later Parts show, this is a limitation not only imposed by the Patent Act, but by the Constitution as well.

Parts III through VI, constituting this Article’s most significant contribution, assess the constitutionality of issuing patents on AI-produced inventions. Part III overviews the six modalities of constitutional interpretation. Subsequent Parts then apply several of those modalities to aid in determining the constitutional scope of inventorship.

Part IV applies the historical modality, diving into the history of the Intellectual Property Clause and the English patent practices that influenced it. Although other commentators have sometimes discussed the historical meaning of “Inventors” in the Intellectual Property Clause, none has engaged in extended analysis to determine whether that language is compatible with patenting an AI-produced invention. Thus, this Part proceeds by analyzing the original constitutional meaning of “Inventors.” It concludes that the English practice of granting “patents of importation” supports a broad conception of “Inventors” that is compatible with patenting AI-produced inventions.

Part V considers the prudential modality. It assesses whether issuing patents on AI-produced inventions would comport with either the utilitarian considerations usually embraced by patent law jurisprudence or with the natural rights conception of patent law espoused by a minority of scholars. It concludes that regardless of whether one endorses utilitarian or natural rights theories to justify patent protections, strong arguments favor Congress’s authority to issue patents on AI-produced inventions.

Part VI approaches this issue through the doctrinal modality. It argues that, historical considerations aside, granting patents on AI-produced inventions would be doctrinally compatible with the utilitarian and natural rights theories traditionally used to justify patent protections. It further argues that, given the wide latitude that federal court decisions have accorded Congress in crafting intellectual property

31. In the time between drafting and publication of this Article, Thaler’s petition for review of the USPTO’s determination has been decided against him in the Eastern District of Virginia. *See* Thaler v. Hirshfeld, No. 20-CV-00903, 2021 WL 3934803, at *1 (E.D. Va. Sept. 2, 2021). As was the case in the USPTO, the Eastern District of Virginia concluded that the plain text of the Patent Act — particularly when considered with reference to the Dictionary Act, which is applicable to all federal statutes and denotes the “‘individual’ as ‘distinct from the list of artificial entities that precedes it’” — limits “inventor” solely to natural persons. *See id.* at *6. But this decision is hardly a definitive interpretation of the Patent Act, both because it is a district court determination carrying no precedential value and because it was decided under a standard deferential to the USPTO’s interpretation, rather than *de novo*. *See id.* at *4 (“[T]he USPTO’s interpretation that an ‘inventor’ must be a natural person is entitled to deference.”).

legislation, Congress likely possesses broad authority to define the scope of inventorship, including in the case of AI-produced inventions.

Part VII considers whether any limitations inherent in the textual structure of the Intellectual Property Clause would preclude issuing patents on AI-produced inventions and concludes that they would not.

A brief Conclusion follows.

II. DOES THE PATENT ACT PERMIT AI INVENTORSHIP?

Thaler contended before the USPTO³² and then argued in a lawsuit before the Eastern District of Virginia³³ that DABUS, as the sole inventor of the two claimed inventions, was properly listed on the patent applications' accompanying data sheets.³⁴ The USPTO rejected this position in its own proceedings³⁵ and prevailed a second time in resisting Thaler's district court lawsuit.³⁶ But Thaler's claim has not yet reached a final resolution (he seeks an appeal in the Federal Circuit),³⁷ and so it remains necessary to assess whether the USPTO got it right: Is DABUS, an AI, really precluded from being listed as the inventor on Thaler's application? Under the current Patent Act, yes.

As the USPTO noted when adjudicating Thaler's petition — and as the district court later affirmed — the Patent Act consistently refers to inventors with terminology most suited to describe natural persons.³⁸ An “inventor” is defined under the Act as “the *individual* or, if a joint invention, the *individuals* collectively who invented or discovered the subject matter of the invention.”³⁹ Likewise, the Act provides that “[w]hoever invents or discovers any new and useful process, machine, manufacture, or composition of matter . . . may obtain a patent therefor”⁴⁰ And § 115 of the Act goes even further in using the terms “*himself*” and “*herself*” when requiring that an “individual” who “believes himself or herself to be the original inventor or an original joint inventor of a claimed invention” provide an oath or declaration to that

32. See generally USPTO, *Thaler Decision*, *supra* note 7.

33. See generally Complaint for Declaratory and Injunctive Relief, *Thaler v. Iancu*, No. 20-CV-00903-LMB-TCBVAED (E.D. Va. Aug. 6, 2020).

34. Plaintiff's Memorandum of Law in Support of Motion for Summary Judgment at 10, *Thaler v. Iancu*, No. 20-CV-00903-LMB-TCBVAED (E.D. Va. Jan. 18, 2021) [hereinafter *Thaler, Motion for Summary Judgment*] (“It is . . . undisputed that DABUS generated the otherwise patentable inventions at issue and that DABUS identified the novelty and salience of these inventions before they were seen by a natural person.”).

35. See USPTO, *Thaler Decision*, *supra* note 7, at 8.

36. See *Thaler*, 2021 WL 3934803, at *1 (granting summary judgment to the USPTO).

37. See Docketing Statement, *Thaler v. Hirshfeld*, No. 2021-2347 (Fed. Cir. Sept. 30, 2021).

38. USPTO, *Thaler Decision*, *supra* note 7, at 4–5; *Thaler*, 2021 WL 3934803, at *4–6.

39. 35 U.S.C. § 100(f) (emphasis added).

40. 35 U.S.C. § 101 (emphasis added).

effect.⁴¹ No matter where one turns, the Patent Act is rife with terms suited primarily for natural persons. To be sure, at least one commentator argues for a broad interpretation of the Patent Act to accommodate AI inventorship,⁴² but the policy arguments favoring such an interpretation cannot “overcome the plain language of the patent laws as passed by the Congress and as interpreted by the courts.”⁴³

Plain text needn’t suffice, however. Existing case law also limits inventorship solely to natural persons, at least under the Patent Act as currently constructed. In *University of Utah v. Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V.*,⁴⁴ the Federal Circuit held that states could not be inventors, as “[i]t is axiomatic that inventors are the *individuals* that conceive of the invention.”⁴⁵ The Federal Circuit acknowledged that “[c]onception is the touchstone of inventorship”⁴⁶ and concluded that “[t]o perform this mental act, inventors must be natural persons,” thus precluding inventorship by a state.⁴⁷ In the same vein, the Federal Circuit had earlier held in *Beech Aircraft Corp. v. EDO Corp.* that corporations can never be inventors for much the same reason.⁴⁸

Consequently, under the existing Patent Act and in light of the interpretation it has been given by the USPTO and Federal Circuit, DABUS cannot be considered an inventor for purposes of Thaler’s application, notwithstanding that DABUS might well be the creator, in the colloquial sense, of both devices. So where does that leave us? Are all AI-produced inventions inherently unpatentable because they lack inventors? Not necessarily. The question of whether an AI can be called an inventor is not the same as the question of whether there is *someone* who can truthfully claim to be the inventor of, and receive rights to, an AI-produced invention that meets all of the standard patentability criteria.

41. 35 U.S.C. § 115(b)(2) (emphasis added).

42. See Ryan Abbott, *I Think, Therefore I Invent: Creative Computers and the Future of Patent Law*, 57 B.C. L. REV. 1079, 1112–13 (2016) (“If creative computers should be inventors, as this Article has argued, then a dynamic interpretation of the law should allow computer inventorship.”).

43. USPTO, *Thaler Decision*, *supra* note 7, at 7 (citing *Glaxo Operations U.K. Ltd. v. Quigg*, 894 F.2d 392, 399–400 (Fed. Cir. 1990)); see *Glaxo*, 894 F.2d at 399–400 (requiring that courts and the USPTO adhere to the plain meaning of language in the Patent Act because striking policy balances in legislative language is Congress’s prerogative).

44. 734 F.3d 1315 (Fed. Cir. 2013).

45. *Id.* at 1323 (emphasis added).

46. *Id.* (quoting *Burroughs Wellcome Co. v. Barr Lab’ys, Inc.*, 40 F.3d 1223, 1227–28 (Fed. Cir. 1994)).

47. *Id.*

48. 990 F.2d 1237, 1248 (Fed. Cir. 1993) (“[The appellee] could never have been declared an ‘inventor,’ as [it] was merely a corporate assignee and only natural persons can be ‘inventors.’” (citing 35 U.S.C. §§ 115–118)).

III. THE MODALITIES OF CONSTITUTIONAL ARGUMENT

Although an AI cannot be an “Inventor” under the current Patent Act, the Constitution’s Intellectual Property Clause might permit a broader conception of “Inventor” than the Patent Act permits as a statutory matter. Unfortunately, like many constitutional provisions, the Intellectual Property Clause is not exactly a model of clarity. It merely provides that Congress shall have the power “[t]o Promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.”⁴⁹

This single sentence leaves countless open questions. What constitutes a discovery? What makes a person — or non-person⁵⁰ — an inventor? And, just as important, which branch of the federal government gets to decide? Can Congress determine for itself whether a particular entity is an inventor, constitutionally speaking, or is this issue of constitutional interpretation best left to the courts?

This Part takes the first step toward resolving those questions. As a launching point for the analysis that follows, this Part first overviews Professor Philip Bobbitt’s modalities of constitutional argument, which provide useful analytical frameworks for interpreting the Intellectual Property Clause. It then identifies a subset of these modalities that are most relevant in interpreting the Intellectual Property Clause. In our view, the relevant modalities are historical, prudential, doctrinal, and textual. The subsequent Parts then apply each of these modalities in turn.

A. The Modalities of Constitutional Interpretation

In two books — *Constitutional Fate* and *Constitutional Interpretation* — Professor Philip Bobbitt articulated six “modalities” that he believed were, as a matter of convention, the basis for all constitutional argument and interpretation in the United States.⁵¹ These six modalities

49. U.S. CONST. art. I, § 8, cl. 8.

50. Let us acknowledge here that our use of “non-human,” “non-person,” and similar terms in this article is to be understood in a broad sense, encompassing any possible inventor (such as a corporation, animal, or AI system) other than a natural person or natural persons.

51. See generally PHILIP BOBBITT, CONSTITUTIONAL FATE: THEORY OF THE CONSTITUTION (1982) [hereinafter CONSTITUTIONAL FATE]; PHILIP BOBBITT, CONSTITUTIONAL INTERPRETATION (1991) [hereinafter CONSTITUTIONAL INTERPRETATION]. Note, however, that Bobbitt only implicitly discussed his sixth modality — ethical argumentation — in *Constitutional Fate* before formally declaring it as one of the six modalities in *Constitutional Interpretation*. See CONSTITUTIONAL FATE, *supra*, at 20–21 (describing ethical argument as a natural result of the “fundamental constitutional arrangement by which rights, in the American system, can be defined as those choices beyond the power of government to compel”); CONSTITUTIONAL INTERPRETATION, *supra*, at 12–13 (referring to the “ethical” modality as one of six).

include historical, textual, structural, prudential, doctrinal, and ethical methods of argument.⁵²

The historical modality — overlapping largely with originalist methods of interpretation — encompasses arguments about what the Framers intended a particular constitutional provision to mean.⁵³ This modality encompasses historical arguments regarding the subjective intent of the Framers in ratifying a particular constitutional provision, as well as arguments regarding the original, objective meaning of particular constitutional terms.⁵⁴

On its face, the textual modality seems to blur with the historical modality, in that both rely on a close reading of the constitutional text.⁵⁵ However, they differ in that the textual modality rejects all historical evidence regarding the meaning of particular text.⁵⁶ Instead, Professor Bobbitt describes this modality as “rest[ing] on a sort of ongoing social contract, in which the terms are given contemporary meanings.”⁵⁷

The structural modality, by contrast, involves principles that are not explicit in the constitutional text.⁵⁸ Instead, they arise by logical implication from the structural allocation of power between the federal government and states, and between the branches of the federal government.⁵⁹ By way of illustration, Professor Bobbitt points to the Supreme Court’s decision in *McCulloch v. Maryland*, which held that a state cannot destroy, or even meaningfully burden, an instrument of the national government.⁶⁰ Because this holding was not mandated by specific constitutional text, Professor Bobbitt sees it as instead arising from structural considerations regarding the relative authority of the state and national governments.⁶¹

The prudential modality requires a fact-intensive evaluation of the costs and benefits of potential holdings, as well as of the legal rules that might be developed and applied in reaching that holding.⁶² This modality emphasizes the competing interests invariably at stake in a particular

52. See CONSTITUTIONAL INTERPRETATION, *supra* note 51, at 12–13 (articulating the six modalities of constitutional argument).

53. See CONSTITUTIONAL FATE, *supra* note 51, at 9 (“Historical arguments depend on a determination of the original understanding of the constitutional provision to be construed.”).

54. See Philip Bobbitt, *Constitutional Fate*, 58 TEX. L. REV. 695, 700–02 (1980) [hereinafter *Bobbitt Lecture Transcript*] (describing the various forms of historical argument, including those rooted in original public meaning).

55. See *id.* at 707 (“In contrast to, but often confused with, historical arguments, are textual arguments.”).

56. See *id.* (“To the textualist, the eighteenth century dictionary is as illegitimate as the twentieth century Brookings pamphlet.”).

57. *Id.*

58. See CONSTITUTIONAL FATE, *supra* note 51, at 79.

59. See *id.*

60. See *id.* at 78–79; *McCulloch v. Maryland*, 17 U.S. 316, 436 (1819).

61. CONSTITUTIONAL FATE, *supra* note 51, at 79 (explaining the structural justifications for the *McCulloch* decision).

62. *Id.* at 59–61.

case, including “competing constitutional interests or competing pieces of constitutional text.”⁶³ Thus, decisions become “a matter of prudence, a calculation of the necessity of the [allegedly unconstitutional] act against its costs.”⁶⁴

The doctrinal modality eschews the fact-bound weighing of costs and benefits characteristic of the prudential modality. Instead, it emphasizes the rule of law and the necessity of “deriving the appropriate rules and following them . . . without regard to any fact not relevant to the rules, such as the status or ultimate purposes of the parties.”⁶⁵ In other words, the doctrinal modality seeks out rules of general applicability, derived from prior case law and other sources of precedent, which are then neutrally applied to resolve materially similar cases, regardless of the practical consequences of the decision.⁶⁶

Professor Bobbitt’s final modality, what he calls “ethical” argument, “appeal[s] to those elements of the American cultural ethos that are reflected in the Constitution.”⁶⁷ In Professor Bobbitt’s eyes, the most “fundamental American Constitutional ethos is the idea of limited government,” which underlies a “constitutional arrangement by which rights are defined as those choices beyond the power of government to compel.”⁶⁸

Importantly, these modalities are not fixed within any relative hierarchy. Instead, they represent “different ways in which propositions of constitutional law could be [proven] true”⁶⁹ For this reason, Professor Bobbitt describes the modalities as incommensurable.⁷⁰ Some modalities are more useful for certain interpretative tasks,⁷¹ but none is inherently superior to the others.

B. The Relevant Modalities

In our view, four of Professor Bobbitt’s modalities are most helpful in interpreting the Intellectual Property Clause. The first, of course, is the historical modality. The Intellectual Property Clause, one of the original provisions of the Constitution, provides an explicit grant of

63. Robert M. Black, *Comparative Law in the Modalities of Constitutional Argument*, 38 N.C. CENT. L. REV. 1, 5 (2015).

64. CONSTITUTIONAL FATE, *supra* note 51, at 61.

65. *Id.* at 41.

66. *See* CONSTITUTIONAL INTERPRETATION, *supra* note 51, at 17–20 (describing the doctrinal modality).

67. *Id.* at 20.

68. Phillip C. Bobbitt, *Is Law Politics*, 41 STAN. L. REV. 1233, 1284 (1989).

69. Jack M. Balkin, *Arguing About the Constitution: The Topics in Constitutional Interpretation*, 33 CONST. COMMENT. 145, 179 (2018).

70. CONSTITUTIONAL INTERPRETATION, *supra* note 51, at 164 (commenting on the “incommensurate nature of the various modalities of argument”).

71. *See* Black, *supra* note 63, at 6–7 (“Each modality also comes with certain inherent weaknesses or limitations.”).

congressional authority amenable to a historical textual analysis.⁷² Moreover, the Intellectual Property Clause was enacted against the backdrop of existing English, colonial, and State patent practices,⁷³ which serve as sources of historical information that can help delineate the full scope of the Clause.

Of all Congress’s enumerated powers, the Intellectual Property Clause alone contains a statement of purpose: “[t]o promote the Progress of Science and useful Arts.”⁷⁴ For this reason, the federal courts have often invoked policy concerns in interpreting the Intellectual Property Clause.⁷⁵ Consequently, Professor Bobbitt’s prudential modality provides a useful means of assessing the policy considerations which might factor into interpreting the scope of the Intellectual Property Clause with respect to AI technology.

The doctrinal modality also provides rich opportunities for interpreting Congress’s patent authority. Because the Clause dates back to the ratification of the Constitution, a substantial body of case law has developed interpreting its meaning. Furthermore, as other scholars have noted,⁷⁶ patent law has previously shown resilience when faced with new technologies, such as biotechnologies which produce valuable — but, as with AI systems, unpredictable — outputs such as monoclonal antibodies.⁷⁷ To the extent that earlier decisions regarding these technologies addressed doctrinal questions not unlike those posed by AI systems, such decisions provide a doctrinal foundation for interpreting the Intellectual Property Clause as applied to AI systems.

Finally, other scholars have argued that the textual structure of the Intellectual Property Clause limits Congress’s patent authority. In particular, some contend that the Clause precludes Congress from enacting patent-like, monopolistic protections under the auspices of other enumerated powers.⁷⁸ These arguments — that the Clause limits other

72. U.S. CONST. art. I, § 8, cl. 8; *see also* Dotan Oliar, *The (Constitutional) Convention on IP: A New Reading*, 57 UCLA L. REV. 421 (2009) (undertaking a historical inquiry to assess the modern scope of the Intellectual Property Clause).

73. *See infra* Part IV (describing historical evidence regarding the Intellectual Property Clause).

74. *See* U.S. CONST. art. I, § 8, cl. 8.

75. *See, e.g.*, *Graham v. John Deere Co.*, 383 U.S. 1, 5–6 (1966) (citing utilitarian concerns regarding societal benefit in support of a more restrictive interpretation of the Patent Act’s nonobviousness requirement).

76. *See* Burk, *supra* note 20, at 312; *see also* Christopher M. Holman, *Developments in Synthetic Biology Are Altering the IP Imperatives of Biotechnology*, 17 VAND. J. ENTER. & TECH. L. 385, 410 (“Although recent judicial decisions appear to have somewhat limited the availability of effective patent protection for biotechnology inventions . . . the consensus among biotechnology patent attorneys . . . appears to be that adequate patent protection remains available . . .”).

77. *See* Burk, *supra* note 20, at 304–05 (describing how patent doctrine has accommodated previous “emergent” technologies, which, like an AI, produce “unpredictable outputs that [are] unforeseen and unforeseeable to their human developers”).

78. *See infra* notes 255–68 and accompanying text.

enumerated powers — are ripe for analysis through Professor Bobbitt’s textual modality.

IV. HISTORICAL

The thorniest puzzle posed by the Intellectual Property Clause — at least with respect to AI-produced inventions — is the meaning of “Inventors.” By its terms, the Intellectual Property Clause limits Congress to granting patents only to “Inventors,”⁷⁹ thereby setting an outer limit on Congress’s authority under the Clause.⁸⁰ With respect to AI-produced inventions, this limit becomes especially important because — as the DABUS decision underscores — an otherwise patent-worthy invention would be unpatentable if it lacked, constitutionally speaking, an inventor.⁸¹

This Part, in an application of the historical modality, considers how the historical context against which the Intellectual Property Clause was ratified can aid in determining the meaning of “Inventors.” It looks first to the ordinary meaning of “Inventors” at the time the Intellectual Property Clause was ratified. It does so both with reference to dictionaries from that time and in light of how the term was historically used in the English patent system. Next, it overviews the colonial and State patent practices that preceded (and served as precursors to) the Clause. Finally, this Part concludes by considering whether any historical evidence suggests that the Framers intended for “Inventors” to have a different meaning in the Intellectual Property Clause than it had traditionally possessed.

79. U.S. CONST. art. I, § 8, cl. 8. See also Edward C. Walterscheid, “*Within the Limits of the Constitutional Grant*”: *Constitutional Limitations on the Patent Power*, 9 J. INTELL. PROP. L. 291, 301 (2002) [hereinafter Walterscheid, *Within the Limits of the Constitutional Grant*] (“This language clearly limits congressional authority to the issuance of patents to inventors for *their* discoveries.”). The careful reader will note that the portions of this Article examining the history of the Intellectual Property Clause rely significantly on the writings of Edward Walterscheid. This Article was not intended as a venture in archival research, and Walterscheid provides among the most thorough and authoritative accounts of the early years of American patent law. See Doron Ben-Atar, Review of Walterscheid, Edward C., *To Promote the Progress of Useful Arts: American Patent Law and Administration 1798–1836*, H-NET REVS.: H-LAW, <https://networks.h-net.org/node/16794/reviews/16893/ben-atar-walterscheid-promote-progress-useful-arts-american-patent-law> [<https://perma.cc/2C6M-AMXS>] (Jan. 1999) (describing Walterscheid’s work as “[a] product of years of exhaustive research . . . contain[ing] much useful information about the first fifty years of American patent law”).

80. See, e.g., Walterscheid, *Within the Limits of the Constitutional Grant*, *supra* note 79, at 292 (“Congress may be more restrictive than the limitations set by the constitutional language, but it may not avoid or ignore those limitations.”).

81. See, e.g., Timothy R. Holbrook, *The Treaty Power and the Patent Clause: Are There Limits on the United States’ Ability to Harmonize?*, 22 CARDOZO ARTS & ENT. L.J. 1, 6 (2004) (“If the language in the clause means ‘*the* inventor,’ and not ‘*an* inventor,’ then exclusive rights must be awarded to the first to invent. Consequently, Congress would not have the power under the Constitution to change the patent law to redefine the term ‘inventor’ . . .”).

*A. Patents of Importation: The Original Public Meaning of
“Inventors”*

The historical modality encompasses various types of historical arguments, which can aid in ascertaining the meaning of otherwise arcane constitutional provisions. A first subset of arguments is based on “original meaning.” When applying original meaning analysis, one seeks to identify the original public meaning of particular statutory or constitutional language at the time that language was enacted.⁸² A second subset of arguments, focusing on “original intent,” looks for evidence of the enacting legislature’s subjective intent to determine the meaning of ambiguous statutory or constitutional language.⁸³ This Section draws on both subsets of historical argument to assess the scope of the term “Inventors” as used in the Intellectual Property Clause.

When using “original meaning” analysis, we strive to interpret a statutory or constitutional provision in light of the “ordinary public meaning” of that provision’s language at the time of enactment.⁸⁴ The operative words of the Intellectual Property Clause so far as patent law is concerned are “Inventors” and “Discoveries,” so we consider the original public meaning of those terms. To do so, we must ask what an ordinary person living at the time that this language was ratified — and lacking any insider knowledge about the legislative process relative to this text — would have understood it to mean. To determine the original public meaning of constitutional terms, scholars often turn to Samuel Johnson’s Revolutionary-era dictionary.⁸⁵ In the 1785 version of this dictionary, an “inventer” is “[o]ne who produces something new; a deviser of something not known before.”⁸⁶ By contrast, “discovery,” is “[t]he act of finding any thing hidden.”⁸⁷

At first glance, these definitions suggest “inventor” in the modern, colloquial sense of the term — the first person to conceive of a particular invention. But these definitions can be interpreted more

82. For a detailed discussion of the original public meaning theory of constitutional interpretation, see RANDY E. BARNETT, *RESTORING THE LOST CONSTITUTION: THE PRESUMPTION OF LIBERTY* 100–09 (2004).

83. See ANTONIN SCALIA & BRYAN A. GARNER, *READING LAW: THE INTERPRETATION OF LEGAL TEXTS* 92, 391–98 (2012) (differentiating between original meaning and original intent analysis).

84. BARNETT, *supra* note 82 (describing how originalists interpret constitutional language).

85. See Gregory E. Maggs, *A Concise Guide to Using Dictionaries from the Founding Era to Determine the Original Meaning of the Constitution*, 82 *GEO. WASH. L. REV.* 358, 359 (2014) (observing that, in a five-year period, over a hundred law review articles referred to various editions of Samuel Johnson’s dictionary to make claims about the original meaning of the Constitution).

86. *Inventer*, A *DICTIONARY OF THE ENGLISH LANGUAGE* (6th ed. 1785). The same page of this dictionary also lists “inventor,” with much the same meaning: “1. A finder out of something new,” or “2. A contriver; a framer.” *Id.* (internal citations omitted).

87. *Discovery*, A *DICTIONARY OF THE ENGLISH LANGUAGE* (6th ed. 1785).

expansively. For instance, one can easily imagine that multiple people might independently discover hidden knowledge.⁸⁸ And if an invention need only be “something not known before,” the natural question is: “Not known where?” It’s conceivable, for example, that an invention need only be previously unknown in the jurisdiction where a patent is sought. In fact, that scenario is more than just conceivable. In prior iterations of the Patent Act, foreign use of an invention, necessarily meaning the invention was known abroad, would not by itself render an invention unpatentable in the United States.⁸⁹

An examination of English patent practices,⁹⁰ which the Framers would have been aware of in drafting the Intellectual Property Clause,

88. Alexander J. Kasner, *The Original Meaning of Constitutional Inventors: Resolving the Unanswered Question of the Madstad Litigation*, 68 STAN. L. REV. ONLINE 24, 26 (2015) (suggesting that “two individuals could . . . both stumble independently upon hidden knowledge”).

89. See, e.g., 35 U.S.C. § 102 (2010). Note, however, that foreign publication of the invention — such as by the issuance of an overseas patent on it — would render the invention unpatentable in the United States. *Id.* In a sense, this allowed something akin to a patent of importation. See *supra* notes 90–100 and accompanying text (further supporting the notion that Congress may issue patents to natural persons who participate only in modest ways in the development of new inventions).

90. Early English patent practice was a far cry from the modern system of patent law. Up until the late 18th century, “patents” — such as they were — came in the form of “letters patent” issued by the monarch. Edward C. Walterscheid, *To Promote the Progress of Science and Useful Arts: The Background and Origin of the Intellectual Property Clause of the United States Constitution*, 2 J. INTEL. PROP. L. 1, 10 (1994) [hereinafter Walterscheid, *To Promote the Progress of Science and Useful Arts*]. Unlike modern patents, letters patent could authorize more than just a temporary monopoly on the manufacture of a useful invention. For instance, they could be used to grant “land, honors, liberties, franchises, or aught besides . . .” *Id.* at 11 (quoting 2 WILLIAM BLACKSTONE, COMMENTARIES *346). These reflected the royal prerogative and were open for public inspection. *Id.*

However, with the introduction of the Statute of Monopolies in 1623, English patent practices became more formalized. *Id.* at 12. The Statute of Monopolies was “the culmination of a long struggle between Parliament and the crown to place curbs on the royal prerogative.” *Id.*; see also Oren Bracha, *The Commodification of Patents 1600–1836*, 38 LOY. L.A. L. REV. 177, 196 (2005) (“The [Statute of Monopolies] was a product of one of the rounds of the conflict over royal power that took place in the early 1620s.”). Section 1 of the Statute “declare[d] as contrary to the law of the realm and utterly void, all monopolies . . . and letters patent . . . to any person or persons . . . of or for the sole buying, selling, making, working, or using of anything within the realm.” Walterscheid, *To Promote the Progress of Science and Useful Arts*, *supra*, at 12 (citing Statute of Monopolies 1623, 21 Jac. c. 3, § 1 (Eng.)). Section 6, however, carved out a patent-relevant exception to § 1, providing that:

[A]ny declaration before mentioned shall not extend to any letters patent and grants of privilege for the term of fourteen years or under, hereafter to be made, of the sole working or making in any manner of new manufactures within this realm, to the true and first inventor and inventors of such manufactures . . . but that the same shall be of such force as they should be, if this act had never been made, and of none other.

Id. at 13 (citing Statute of Monopolies 1623, 21 Jac. c. 3, § 6 (Eng.)).

The Statute of Monopolies was therefore the controlling legal framework for English patent practice when the Constitution was ratified in 1787. Walterscheid, *To Promote the Progress of Science and Useful Arts*, *supra*, at 12. Legal historian Edward Walterscheid posits that the Framers would have found three aspects of English patent practice important. First,

supports a broader interpretation of “Inventors.”⁹¹ In Great Britain, the common law treated as an “inventor” any individual who physically introduced an invention to the realm.⁹² In other words, an invention did not need to be truly novel to be patentable; it needed only be previously unknown in the realm.⁹³

In ratifying the Intellectual Property Clause, the Framers likely wished “to assure that Congress would have the authority to engage in something akin to the British patent practice as it existed near the end of the eighteenth century.”⁹⁴ This isn’t altogether surprising; patents were seen as a key factor driving Great Britain’s rapid industrialization in the seventeenth century.⁹⁵ Importantly, the Founders would have

the general rule was to ban monopolies, yet patents were an exception to that rule because they were “in the interest of the public at large.” *Id.* at 13. Second, patents were solely a matter of sovereign (in English practice, royal) prerogative, rather than being a common-law right. *Id.* Finally, the Framers would likely have seen patents as an essential tool for promoting the nation’s industrial development, just as they had been in promoting Britain’s industrial development. *See id.* at 14 (“[P]atents were beginning to be perceived as playing an increasingly important role in the industrial development of Great Britain.”).

This last point — concern with promoting national industrial development — was likely paramount, as Congress’s power under the Intellectual Property Clause was a noteworthy departure from the Articles of Confederation, which, by mandating that “[e]ach State retain[ed] . . . every power, jurisdiction and right, which [was] not by this confederation expressly delegated to the United States, in Congress assembled,” ARTICLES OF CONFEDERATION, art. II, *reprinted in* 9 JOURNALS OF THE CONTINENTAL CONGRESS 1774–1789, 907, 908 (Worthington C. Ford ed., 1906), had kept the federal government from issuing patents and copyrights. Walterscheid, *To Promote the Progress of Science and Useful Arts*, *supra*, at 9 (“Article II’s use [in the Articles of Confederation] of the term ‘expressly’ severely restricted the national government’s authority . . . For by the literal language of Article II, if the Articles did not expressly delegate a power, jurisdiction, or right, the Congress could not exercise that authority. It was for this reason that the Continental Congress never attempted to issue patents or grant any form of exclusive rights to inventors in their inventions.”).

91. *See, e.g.*, Kara W. Swanson, *Inventing While a Black Woman: Passing and the Patent Archive*, 25 STAN. TECH. L. REV. (forthcoming 2022) (manuscript at 19) (on file with SSRN), <https://ssrn.com/abstract=4007539> [<https://perma.cc/SLX8-NAJL>] (arguing, as we do, that British patent practices and other antecedents to the Intellectual Property Clause support a broader conception of “Inventors”).

92. *See* Walterscheid, *Within the Limits of the Constitutional Grant*, *supra* note 79, at 355–56 (“[T]he early English patent custom arose out of a desire to create new industries in the realm primarily by importation and only secondarily by what would now be termed invention.”); *see also* Kasner, *supra* note 88 (“In the common law, ‘invention’ typically meant the physical act of introducing a product or process to society instead of the mental process of creation.” (citing E. Wyndham Hulme, *The History of the Patent System Under the Prerogative and at Common Law*, 12 L.Q. REV. 141, 151 n.1 (1896))).

93. *See* Walterscheid, *Within the Limits of the Constitutional Grant*, *supra* note 79, at 307 (“Novelty . . . had a very broad connotation, and originality was only peripherally involved. This . . . permitted patents of importation under the English practice.”). *See also* Paul J. Heald & Suzanna Sherry, *Implied Limits on the Legislative Power: The Intellectual Property Clause as an Absolute Constraint on Congress*, 2000 U. ILL. L. REV. 1119, 1164 (2000) (“[Patents of importation] were awarded not to inventors but to capitalists who needed a special economic incentive to set up shop in the United Kingdom.”).

94. Walterscheid, *Within the Limits of the Constitutional Grant*, *supra* note 79, at 355.

95. *Id.* at 355–56 (“A primary reason for seeking to adopt and adapt the British patent custom was that it was perceived to be an important factor in the rapid industrialization of

known that the concept of inventorship extended beyond those individuals who first create a particular invention. Although the 1623 Statute of Monopolies — the primary legal framework for English patent practice — nominally permitted patents to be issued only to the “true and first inventor” of the claimed invention, this language was never interpreted literally.⁹⁶ Moreover, so-called patents of importation — that is, patents issued to a person who introduced a useful invention to the realm, even without having been the first to create it — weren’t just permissible under the English patent system; they were its backbone.⁹⁷ For that matter, patents of importation were common worldwide; every nation that had a patent system in the eighteenth century, other than the United States, granted patents of importation to encourage industrious individuals to bring new technology to the realm.⁹⁸

What’s more, the Framers chose language for the Intellectual Property Clause that, if anything, is *more* permissive with regard to inventorship than the Statute of Monopolies. Although the Statute of Monopolies (at least nominally) required that patents issue only to a claimed invention’s “true and first” inventor, the Intellectual Property Clause omits “true and first,” seemingly broadening the meaning of “Inventors.”⁹⁹ Consequently, there is nothing inherent in the Framers’ choice of language that suggests a narrower concept of “Inventors” than was understood at common law. To the contrary, given that every other nation with a patent system during the eighteenth century permitted patents of importation,¹⁰⁰ it seems strange to think that the Framers would have meant to *narrow* the meaning of “Inventors” by adopting *broader* language.

For these reasons, the Intellectual Property Clause’s use of “Inventors” is not on its face incompatible with issuing a patent on an

Great Britain that had recently commenced . . . Bear in mind that the early English patent custom arose out of a desire to create new industries in the realm primarily by importation and only secondarily by what would now be termed invention.”)

96. *See id.* at 309 (“There is no reason to believe that [the Framers] were not conversant with the fact that the common law had interpreted ‘true and first inventor’ as it appeared in the Statute of Monopolies to include the first importer.”); *see also* Heald & Sherry, *supra* note 93, at 1186 (“Thus, ‘inventors’ [under the Statute of Monopolies] included those who by their efforts introduced products into the realm that they did not themselves invent.”).

97. *See* Walterscheid, *Within the Limits of the Constitutional Grant*, *supra* note 79, at 355–56 (“[T]he early English patent custom arose out of a desire to create new industries in the realm primarily by importation and only secondarily by what would now be termed invention.”).

98. *Id.* at 314.

99. *Cf.* Statute of Monopolies 1623, 21 Jac. c. 3, § 6 (Eng.) (indicating that “[the general ban on monopolies] shall not extend to . . . patents . . . [issued] to the true and first inventor”) with U.S. CONST. art. I, § 8, cl. 8 (permitting Congress “[t]o promote the Progress of Science and useful Arts, by securing for limited Times to . . . Inventors the exclusive Right to their . . . Discoveries.”).

100. *See* Walterscheid, *Within the Limits of the Constitutional Grant*, *supra* note 79, at 314 (“At the end of the eighteenth century, all other countries with patent systems granted patents of importation . . .”).

AI-produced invention.¹⁰¹ To be sure, an AI-produced invention might lack a human “inventor” if that term is literally construed to mean the first person to *create* a particular invention, even if only as a mental act.¹⁰² But that isn’t what “Inventors” meant at the time the Clause was enacted. To the contrary, the English tradition of granting patents of importation allowed an individual to obtain a patent — in other words, to *be* an inventor — merely by providing the public benefit of introducing an invention “not known or used” in the realm.¹⁰³ Tracing this tradition from patents of importation to the present day, it’s hardly a stretch to think that, for constitutional purposes, an individual could be deemed an inventor upon introducing to society a previously unknown, AI-produced invention. Although the current Patent Act admittedly seems not to permit such an arrangement,¹⁰⁴ nothing would bar Congress from changing the scope of inventorship as a statutory matter, so long as it passes constitutional muster.

That said, American legal practices haven’t always followed in lockstep with their English predecessors.¹⁰⁵ As a result, it is necessary to dive a little deeper into history to assess whether any idiosyncratic aspects of early United States patent practices preclude the broader concept of “Inventors” apparently embraced by the English common law. The next subsection moves in that direction by overviewing patent practices in the American colonies and in the States under the Articles of Confederation.

101. The federal courts, for their part, have not articulated a narrow constitutional definition of “Inventors.” *See, e.g., id.* at 317 (“If there had been any general feeling that ‘in common parlance’ the terms ‘inventors’ and ‘discoveries’ in the Constitution precluded any expansive definition of patentable novelty, it would have been extremely easy for federal judges to say so, but they did not.”).

102. *See, e.g.,* Kaelyn R. Knutson, Note, *Anything You Can Do, AI Can’t Do Better: An Analysis of Conception as a Requirement for Patent Inventorship and a Rationale for Excluding AI Inventors*, 11 CYBARIS INTELL. PROP. L. REV., no. 2, 2020, at i, 27 (“If the AI cannot be listed as the inventor on a patent application for that subject matter, and the developers cannot be listed either, then there is no proper inventor.”).

103. For that matter, at least one Founding Era inventor, Oliver Evans, forcefully advocated for patent protections for first importers, asking rhetorically: If an individual “travel[ed] over Europe, Asia, and Africa at great expense” to bring new inventions back to the United States, would the Framers have truly intended that he receive no “reward for such expensive and patriotic labours to promote the welfare of his fellow citizens?” OLIVER EVANS, EXPOSITION OF PART OF THE PATENT LAW BY A NATIVE BORN CITIZEN OF THE UNITED STATES 60–61 (1816).

104. *See infra* note 150 (explaining how the current Patent Act prohibits patents of importation).

105. *See, e.g.,* Walterscheid, *Within the Limits of the Constitutional Grant*, *supra* note 79, at 313–14 (“[Madison] was convinced that the Constitution had not incorporated the common law as the law of the land, as indeed it had not . . .”).

B. Early Colonial and State Patent Practices

Unfortunately, patent practices in the American colonies and in the States under the Articles of Confederation are not terribly illuminating for our purposes. Although some patents were issued in the colonies,¹⁰⁶ they were a rarity compared to their English counterparts.¹⁰⁷ In England, patents were a matter of royal prerogative; theoretically, this was true in the colonies as well.¹⁰⁸ Yet there is little to no evidence that either the English crown or its royal governors issued patents in the American colonies with any noteworthy frequency.¹⁰⁹ Instead, colonial patents appear to have been issued primarily under the assumed authority of local legislatures.¹¹⁰

The limited number of colonial patents probably resulted in large part from the agrarian culture of the American colonies. No more than ten percent of the population was involved in manufacturing,¹¹¹ and the colonies therefore lacked the expansive industrial base that would justify the time, effort, and cost of obtaining and enforcing a patent.¹¹² In fact, patents in the colonies were so rarely sought and so seldom enforced that historians have yet to discover any recorded litigation involving colonial patents.¹¹³

When the United States finally obtained independence from Great Britain, the States continued the colonial legislatures' practice of issuing patents and copyrights.¹¹⁴ This was done, however, on an essentially ad hoc basis. Although many states passed copyright laws after obtaining independence,¹¹⁵ none enacted a standalone patent statute

106. See Walterscheid, *To Promote the Progress of Science and Useful Arts*, *supra* note 90, at 14. ("A patent custom involving exclusive grants of privilege for limited terms with respect to invention and importation existed in a number of the American colonies.")

107. See *id.* (noting that the custom of granting patents in the colonies "developed in parallel with th[ose] in England, albeit on a much more sporadic and less uniform scale").

108. *Id.* at 14–15.

109. See *id.* at 15 (discussing lack of evidence that patents were granted in the American colonies under royal authority).

110. See *id.* ("[W]hile [local legislatures were] not formally invested with such sovereign power, [they] readily assumed the authority in practice." (quoting E. BURKE INLOW, *THE PATENT GRANT* 36 (photo. reprt. 1968) (1950))).

111. *Id.* (citing E. BURKE INLOW, *THE PATENT GRANT* 37 (photo. reprt. 1968) (1950)).

112. *Id.* at 15–16 (citing E. BURKE INLOW, *THE PATENT GRANT* 38 (photo. reprt. 1968) (1950)) (arguing that patent rights were not highly valued in the colonies).

113. *Id.* at 16 (citing E. BURKE INLOW, *THE PATENT GRANT* 39 (photo. reprt. 1968) (1950)) (noting the complete absence of recorded colonial patent litigation).

114. *Id.* at 15 ("After the Revolution, the state assemblies and legislatures — taking up where their colonial predecessors had left off — continued to exercise this self-assumed authority.")

115. In a May 2, 1783 resolution, the Continental Congress had recommended that the States adopt copyright laws. *Id.* at 20 (internal citation omitted) (quoting 24 *JOURNALS OF THE CONTINENTAL CONGRESS 1774–1789*, at 326–27 (Worthington C. Ford ed., 1906)). The States appear to have responded: In a three-year period from 1783 to 1786, twelve states

guaranteeing inventors a period of exclusive rights to their inventions.¹¹⁶ Nor, for that matter, did any of the states establish administrative systems granting patents.¹¹⁷ As a consequence, every state-issued patent required a one-time, inventor-specific authorization by the local legislature.¹¹⁸

Patents were issued more often in the newly independent States than they had been in the colonies, but were still rare.¹¹⁹ Furthermore, the few patents issued by the States proved ineffectual because they could be “infringed with impunity” outside the enacting State’s territory.¹²⁰ Obtaining multiple state patents was theoretically possible, but this was “time consuming [and] expensive,” and, given the variance in patent terms from state to state, did not guarantee consistent protection for an inventor.¹²¹ Indeed, it has been suggested that one of the primary reasons the Intellectual Property Clause was ratified was to overcome the barriers to trade created by conflicting state patent and copyright grants by permitting a preemptive federal authority in this area.¹²²

Taken as a whole, the history of colonial and early State patent practices has little bearing on the constitutional scope of inventorship. The limited evidence that is available suggests that patents were rarely sought or issued in the United States, both during the colonial period and under the Articles of Confederation. This likely resulted in large part from several factors, including the relative worthlessness of a patent in a primarily agrarian society, the difficulty of obtaining a patent

passed copyright laws. *Id.* at 21 (citing BRUCE W. BUGBEE, GENESIS OF AMERICAN PATENT AND COPYRIGHT LAW 110–22 (1967)).

116. *Id.* at 16. One state — South Carolina — granted some rights to inventors, but only as part of copyright law providing that: “The Inventors of useful machines shall have a like exclusive privilege of making or vending their machines for the like term of 14 years, under the same privileges and restrictions hereby granted to, and imposed on, the authors of books.” *Id.* (internal citation omitted) (citing 4 THE STATUTES AT LARGE OF SOUTH CAROLINA 618–20 (Thomas Cooper ed., 1838)).

117. Even the South Carolina copyright and patent statute, *see supra* note 116, lacked administrative procedures for issuing patents. *Id.* at 16–17 (citing P.J. Federico, *State Patents*, 13 J. PAT. OFF. SOC’Y 166, 167 (1931)).

118. *Id.* (“[T]he granting of each patent required a special act of the legislature.”).

119. *Id.* at 17 (“Following the cessation of hostilities with Great Britain, a significant renewal of patenting activity occurred . . . [I]t is difficult to know precisely how many state patents were actually granted prior to 1787, but it is unlikely that the total exceeded twenty.”). Copyrights were comparatively widespread, perhaps in part because they had — unlike patents — developed in England to be a common-law right, rather than a matter of sovereign discretion. *Id.* at 17–19 (discussing copyright practices in England during the 17th and 18th centuries, culminating in the 1769 King’s Bench decision in *Millar v. Taylor*, (1769) 98 Eng. Rep. 201 (KB), which established that authors possessed a common law copyright).

120. *Id.* at 22.

121. *Id.*

122. Such barriers underpinned one of the Supreme Court’s early Commerce Clause decisions. *Gibbons v. Ogden*, though better known for launching the Supreme Court’s dormant Commerce Clause doctrine, originated as a patent lawsuit resulting from the conflicting steamship patents granted to the litigants by New York and New Jersey, respectively. *See* 21 U.S. 1 (1824).

when each patent was contingent upon a private legislative act, and the impracticality of enforcing essentially regional patents over a wider geographical area.¹²³ For our purposes, the dearth of patents in this era gave little opportunity for American patent practices to diverge from their English equivalents, including with respect to patents of importation. Consequently, we must seek additional historical context by looking forward in time to the ratification of the Intellectual Property Clause and to the earliest iteration of the Patent Act, which followed soon after.

C. *Contrary Intent?*

As we have shown, the plain text of the Intellectual Property Clause, when read in light of historical context, does not preclude patents of importation, and the patent practices of the colonies and States under the Articles of Confederation appear not to have meaningfully diverged from English practices, which embraced patents of importation. Nonetheless, the possibility remains that the Framers intended for “Inventors” in the Intellectual Property Clause to have a narrower meaning than at common law. It seems a little odd, after all, to think that the Framers — many of whom were skeptical of federal authority and particularly of government-supported monopolies¹²⁴ — could have intended for patents to issue on inventions that no human played a meaningful role in creating. To see whether the Framers, contrary to the language they chose, intended for the Intellectual Property Clause to be construed more narrowly than what the common law and unbroken tradition would suggest, we will consider contemporaneous comments by various Founders¹²⁵ on the scope of Congress’s intellectual property authority, as well as the First Congress’s treatment of the Clause in enacting the original Patent Act.

123. See Walterscheid, *To Promote the Progress of Science and Useful Arts*, *supra* note 90, at 15 (describing the various reasons why “inventors in the colonies never sought [patents] on anything resembling the scale that occurred in England”).

124. See *infra* notes 139–46 and accompanying text (describing various Founders’ — particularly Thomas Jefferson’s — general distaste for monopolies, including patents).

125. As used in this Article, “Founders” refers to the Founding Fathers generally, whereas “Framers” refers specifically to those of the Founders who participated in the drafting of the Constitution. Because Thomas Jefferson was serving overseas as the Minister to France during the drafting of the Constitution, he is a Founder but not a Framers. See Adam Mossoff, *Who Cares What Thomas Jefferson Thought About Patents? Reevaluating the Patent “Privilege” in Historical Context*, 92 CORNELL L. REV. 953, 962 n.43 (2007) (acknowledging, in discussion of Jefferson’s letter to inventor Isaac McPherson, that Jefferson was “a Founder, albeit not a Framers . . .”) (cleaned up).

1. Contemporaneous Comments on the Ratification of the Intellectual Property Clause and on Proposed Amendments Limiting Monopolies

The historical record is notoriously silent when it comes to the ratification of the Intellectual Property Clause.¹²⁶ As various legal historians have noted, the Intellectual Property Clause was introduced only near the end of the Constitutional Convention, and it was passed unanimously and without debate on September 5, 1787.¹²⁷ For this reason, Edward Walterscheid quips that “original intent analysis of the [intellectual property clause] . . . does not quite resemble the empty page describing the sex life of a steer, but scarcity of evidence makes the inquiry hardly more productive.”¹²⁸

126. Despite the silence, Walterscheid theorizes several reasons why the Intellectual Property Clause might have been ratified. First, he notes that the Intellectual Property Clause is unique amongst Congress’s enumerated powers in that it provides a specific method by which its purpose is to be carried out. Walterscheid, *To Promote the Progress of Science and Useful Arts*, *supra* note 90, at 32. From this, he infers that the Clause was meant to ensure Congress could promote the progress of science and the useful arts specifically through the issuance of limited monopolies, perhaps because the delegates were uncertain Congress would be able to do so without explicit authority. *See id.* at 32–34 (suggesting that the delegates’ decision to provide Congress with patent authority “in no small measure seems to have been predicated on their desire to follow the English practice of granting exclusive rights through the issuance of patents or a similar device . . . [which they] were not at all certain that the Congress would have the power to do . . . without an explicit grant of authority.”).

Additionally, he contends that the delegates had pragmatic reasons for embracing patents: among the different means of promoting the progress of science and the useful arts, patents “would cost the federal government the least to implement.” *See id.* at 34 (“This cost consideration was critical for a new federal government that was taking over the state debts inherited from the Revolutionary War.”).

Finally, because the majority of the Convention delegates had served in the Continental Congress, they would have recognized the need for a patent power in light of their frustrating inability to issue limited-term monopolies under the Articles of Confederation. *See The Delegates*, DIGIT. HIST., https://www.digitalhistory.uh.edu/disp_textbook.cfm?smtID=2&psid=3233 [<https://perma.cc/A3G8-47M7>] (noting that forty-four out of fifty-five delegates to the Constitutional Convention had served either in the Continental Congress or in the Congress established by the Articles of Confederation). Yet to avoid “giv[ing] the Congress any general power to create monopolies,” Congress would have needed to expressly provide for limited patent and copyright monopolies. *See Walterscheid, To Promote the Progress of Science and Useful Arts*, *supra* note 90, at 37–38 (“[T]he Framers were cognizant that the patent grant constituted an express exception to the general ban on monopolies that had existed in England for more than one hundred and fifty years . . . Therefore, if the Framers were to give power to Congress to secure exclusive rights for limited times to inventors in their discoveries, it was necessary to do so expressly.”). Consequently, the need for an explicit patent power “would have seemed so obvious as to merit almost no discussion.” *Id.* at 38.

127. *See, e.g., Heald & Sherry, supra* note 93, at 1148 (“There is no record of any debate over the Intellectual Property Clause at the Constitutional Convention.”); Walterscheid, *To Promote the Progress of Science and Useful Arts*, *supra* note 90, at 26 (“Contemporaneous records such as [James] Madison’s notes indicate that [the Clause] was adopted *nemine contradicente* and without debate.”).

128. Edward C. Walterscheid, *The Nature of the Intellectual Property Clause: A Study in Historical Perspective (Part 1)*, 83 J. PAT. & TRADEMARK OFF. SOC’Y 763, 766 n.3 (2001) [hereinafter Walterscheid, *The Nature of the Intellectual Property Clause*] (alteration in

This silence could be interpreted in multiple ways. One view is that the Intellectual Property Clause was seen as so essential that it merited no debate.¹²⁹ But there's another possibility: Perhaps, after spending the past several months engaged in a long and "sometimes acrimonious debate," the Framers were simply tired, ready to go home, and eager to forge ahead when presented with a less contentious constitutional provision.¹³⁰ This might especially have been the case if they had seen the Intellectual Property Clause as merely a pro forma adoption of English intellectual property practices.¹³¹

There's some evidence that this latter view is correct. Despite the obvious deficiencies of state-based patent regimes,¹³² the Founders were seemingly in no hurry to remedy the issue. In the lead-up to the Constitutional Convention in 1787, only a single delegate — James Madison — wrote about the need for a national scheme of intellectual property protection.¹³³ And even Madison appears to have given that concern little weight; he described "the [need for] uniformity in the laws concerning naturalization & literary property" as being of "inferior moment" compared to the other concerns motivating the Convention.¹³⁴ Furthermore, none of the "general systems of governance" initially debated at the Convention would have provided federal authority to issue patents and copyrights, nor were such powers included in the collection of enumerated powers initially proposed and debated at the Convention.¹³⁵

It was not until August 18, 1787 — just three weeks before the Intellectual Property Clause was adopted — that any delegate to the

original) (quoting LEONARD LEVY, *ORIGINAL INTENT AND THE FRAMERS' CONSTITUTION* 124 (1988)).

129. Walterscheid, *To Promote the Progress of Science and Useful Arts*, *supra* note 90, at 26 ("[M]ost commentators on the origin of U.S. patent law take this absence [of debate] to mean that [the Clause] met universal approbation . . .").

130. *Id.* at 26–27.

131. *See id.* at 27 n.89 (quoting Morgan Sherwood, *The Origins and Development of the American Patent System*, 71 *AM. SCI.* 500, 500 (1983)) ("[I]t is more likely that the authors of the Constitution simply followed the English precedent and chose the patent without paying much attention to the subject . . .").

132. *See supra* notes 119–23 and accompanying text (describing the limitations inherent in a state-based patent regime).

133. Walterscheid, *To Promote the Progress of Science and Useful Arts*, *supra* note 90, at 23–24 (citing JAMES MADISON, *NOTES OF DEBATES IN THE FEDERAL CONVENTION OF 1787* 4–19 (1966)).

134. *Id.* at 24 (internal citation omitted) (citing 4 *DOCUMENTARY HISTORY OF THE CONSTITUTION OF THE UNITED STATES OF AMERICA, 1786-1870*, at 128 (Washington, Dep't St. 1894-1905)).

135. *Id.* at 24–25. Walterscheid notes that one commentator indicated that Virginia and New York proposed constitutional frameworks establishing federal patent powers, but concludes there is no evidence that this was the case. *Id.* at 25 (first citing E. BURKE INLOW, *THE PATENT GRANT* 46 (photo. repr. 1968) (1950); then citing Karl Fenning, *The Origin of the Patent and Copyright Clause of the Constitution*, 17 *GEO. L.J.* 109, 110–11 (1929)).

Convention proposed a federal intellectual property power.¹³⁶ Even then, no one seemed willing to take the credit. There are conflicting accounts as to whether James Madison or South Carolina representative Charles Pinckney first proposed a federal patent power, and Madison’s own notes only added to the confusion when he revised them after the fact to indicate that Pinckney had been the sole proponent of a federal patent authority.¹³⁷ After the Convention adopted the Intellectual Property Clause, this apparent apathy toward federal patent powers persisted. At only two of the state ratifying conventions was the Intellectual Property Clause even mentioned, albeit positively, and these mentions were solely with reference to the Clause’s grant of federal copyright authority.¹³⁸

While discussion of the Clause at the Constitutional Convention and the state ratification proceedings was essentially nonexistent, several Founders expressed their thoughts on intellectual property protections in the adjacent years. Some approached intellectual property protections skeptically. Thomas Jefferson, for instance, was notoriously hostile to government-sponsored monopolies of any sort, including patent protections.¹³⁹ When Madison sent him a draft copy of the Constitution in 1788, Jefferson, then serving overseas as Minister to France, sought the inclusion of a provision barring the federal government from granting any monopolies, including patents and copyrights.¹⁴⁰ Madison didn’t dispute Jefferson’s characterization of patents as a form of monopoly, but he gently rejected Jefferson’s request, remarking: “But is it clear that as encouragements to literary works and ingenious discoveries, they are not too valuable to be wholly renounced?”¹⁴¹

As we know, Jefferson’s viewpoint didn’t win the day — the Intellectual Property Clause was ratified and remains with us today. Even

136. *Id.* at 43.

137. *Id.* at 45–47 (discussing Madison’s “enigmatic” revised notes on the Convention proceedings). Walterscheid ultimately concludes that “Madison . . . provides the best evidence that Pinckney first proposed a constitutional grant of congressional power to issue patents for useful inventions.” *Id.* at 47. He bases this conclusion, in part, on the fact that Madison was known as a scholar, “highly interested in protecting the interests of authors,” whereas Pinckney was a more pragmatic politician with an acute “aware[ness] of his constituents’ concerns,” particularly with respect to “agriculture, commerce, trades, manufactures, and useful invention[s].” *Id.* at 47–48.

138. *See id.* at 56 (“The clause was briefly and favorably mentioned during two of the state ratification contests, but only in the context of its grant of authority to the Congress to establish copyright.”).

139. *See* JANICE M. MUELLER, AN INTRODUCTION TO PATENT LAW 131 (2003) (noting that Jefferson was known to refer to exclusive patents as an “embarrassment”).

140. Mossoff, *supra* note 125, at 983–84 (internal citation omitted) (quoting Letter from James Madison to Thomas Jefferson (Oct. 17, 1788), in 11 THE PAPERS OF JAMES MADISON 295, 295–300 (Charles F. Hobson & Robert A. Rutland eds., 1977)).

141. *Id.* at 984.

so, “Jefferson’s aversion to monopolies was not unique.”¹⁴² George Mason, who was a Framers and, like Jefferson, a Virginian, “refused to sign” the Constitution because he believed that the Necessary and Proper Clause at the end of Article I, Section 8 would permit Congress to “grant monopolies in trade and commerce.”¹⁴³ In the same vein, the ratifying conventions of New York, Massachusetts, New Hampshire, and North Carolina all recommended that various anti-monopoly provisions be adopted as part of the Bill of Rights.¹⁴⁴ Indeed, at least one modern scholar believes that the Intellectual Property Clause was specifically intended to overcome this resistance to monopolies, functioning essentially as an American equivalent to the Statute of Monopolies’ carveout for patents,¹⁴⁵ and designed to ensure that Congress would have the specific authority to promote progress by issuing limited-term patents and copyrights.¹⁴⁶

Ironically, Jefferson’s advocacy for stricter limits on the Intellectual Property Clause arguably supports a broader interpretation of the Clause, which was never limited as he hoped. Post-ratification, in a 1789 letter to Madison, Jefferson requested that a provision be added to the then-pending Bill of Rights providing that “[m]onopolies may be allowed to persons for their own productions in literature, and their own inventions in the arts for a term not exceeding — years, but for no longer term and for no other purpose.”¹⁴⁷ This request wasn’t successful, of course,¹⁴⁸ but Jefferson’s push for narrower limits on who could receive a patent — only those claiming “*their own*” inventions — suggests that he recognized the plain language of the Intellectual Property Clause as permitting patents of importation.¹⁴⁹ And, of course, if the Intellectual Property Clause permits patents of importation, as this

142. Walterscheid, *To Promote the Progress of Science and Useful Arts*, *supra* note 90, at 55.

143. *Id.* (quoting *Objections of the Hon. George Mason, One of the Delegates from Virginia in the Late Continental Convention, to the Proposed Federal Constitution, Assigned as His Reasons for Not Signing the Same*, 2 AMERICAN MUSEUM OR REPOSITORY OF ANCIENT AND MODERN FUGITIVE PIECES, ETC. 534, 536 (AMS Press, Inc. 1965) (1787)).

144. *See id.* at 55–56.

145. *See supra* note 90 (overviewing the provisions of the Statute of Monopolies).

146. Walterscheid, *To Promote the Progress of Science and Useful Arts*, *supra* note 90, at 56 (“[T]hese views demonstrate why the delegates to the Constitutional Convention saw the need to delineate expressly the congressional authority to secure ‘for limited times to authors and inventors, the exclusive right to their respective writings and discoveries.’” (quoting U.S. CONST. art. I, § 8, cl. 8)).

147. Walterscheid, *The Nature of the Intellectual Property Clause*, *supra* note 128, at 770–71.

148. *See* U.S. CONST. amends I–X; *see also* Walterscheid, *The Nature of the Intellectual Property Clause*, *supra* note 128, at 770 (“[Jefferson] was no more successful now than he had been earlier.”).

149. *Id.* at 770–71.

Article asserts, that militates in favor of defining “Inventors” broadly in the present day.¹⁵⁰

Aside from Jefferson’s open distaste for the Intellectual Property Clause, commentary from the Founders on the Clause is sparse. There is only one formal document from a Framers — Federalist No. 43 — that directly comments on the patent power.¹⁵¹ There, in discussing the Intellectual Property Clause, James Madison wrote that:

The utility of [Congress’s intellectual property] power[s] will scarcely be questioned. The copyright of authors has been solemnly adjudged, in Great Britain, to be a right of common law. The right to useful inventions seems with equal reason to belong to the inventors. The public good fully coincides in both cases with the claims of individuals. The States cannot separately make effectual provisions for either of the cases, and most of them have anticipated the decision of this point, by laws passed at the instance of Congress.¹⁵²

In keeping with Madison’s earlier statements regarding intellectual property protections, this passage suggests that he saw the Clause as (1) necessary for ensuring federal authority in an area where state action had proven ineffectual; and (2) permitting limited monopolies specifically when doing so would be in the public interest, as had been the case with the Statute of Monopolies’ exception for manufacturing patents.¹⁵³

Frustratingly, outside of these limited remarks from Jefferson and Madison, there is virtually no contemporaneous commentary on the patent power from other Founders.¹⁵⁴ That said, the First Congress — comprised in large part of former delegates to the Constitutional Convention — would soon have the opportunity to evaluate the scope of the Intellectual Property Clause in enacting the first Patent Act.

150. This is not to say, however, that the Patent Act as written permits patents of importation: it does not. The current Act denies a patent on any claimed invention that was “patented, described in a printed publication, or in public use, on sale, or otherwise available to the public” prior to the filing date of the application, and does so with no geographic restrictions. 35 U.S.C. § 102(a).

151. Mossoff, *supra* note 125, at 979 (“The only official, public document in which a Founder expressly discussed patents is *The Federalist No. 43*.”).

152. See THE FEDERALIST NO. 43 (James Madison).

153. See Walterscheid, *To Promote the Progress of Science and Useful Arts*, *supra* note 90, 10–13 (overviewing the provisions of the Statute of Monopolies).

154. See Mossoff, *supra* note 125, at 962 & n.43 (internal quotations omitted) (noting that, apart from Federalist No. 43, “no Framers ever offered any explanation of the [Intellectual Property Clause] or of why it was included in the . . . Constitution.”).

2. Patents of Importation and the 1790 Patent Act

The First Congress, which enacted the Patent Act of 1790, apparently gave some thought to patents of importation. The initial draft of the Act, presented to the House on February 16, 1790, required that a claimed invention not be “before known or used *within the United States*,”¹⁵⁵ which “clearly indicat[ed] that an invention known or used outside the United States could be patented in the United States.”¹⁵⁶ And if that weren’t sufficiently clear, Section 6 of the same Bill provided that “the first importer of any art, machine, engine, device or invention, or any improvement thereon should be treated as if he or she were the original inventor or improver within the United States.”¹⁵⁷ Subsequent debate, however, resulted in the elimination of both the qualifier — “in the United States” — and Section 6.¹⁵⁸ What happened? It looks like the First Congress developed constitutional cold feet.

James Madison appears to have scuttled the effort. In a letter from then-Assistant Treasury Secretary Tench Coxe to Madison, Coxe commented on Madison’s apparent “apprehension, that the benefit of a patent could not be constitutionally extended to imported objects,”¹⁵⁹ and Madison’s response a week later seemed to affirm that this was his view.¹⁶⁰ The strange part, however, is that Madison never provided reason for this view, either in the context of the 1790 Patent Act or in any of his “voluminous writings” from the Constitutional Convention.¹⁶¹ Nor is there any clear record of who raised the constitutional concern during the debates about the Act.¹⁶² What *is* clear, however, is that many of Madison’s fellow Founders took a different position.

George Washington himself had recommended to Congress that the 1790 Patent Act permit patents of importation. In his first State of the Union Address on January 8, 1790, then-President Washington urged Congress to make provisions for “the advancement of

155. *Patents Act [H.R. 41]*, in 6 DOCUMENTARY HISTORY OF THE FIRST FEDERAL CONGRESS OF THE UNITED STATES OF AMERICA, LEGISLATIVE HISTORIES 1620, 1626–37 [hereinafter DOCUMENTARY HISTORY] (L.G. De Pauw et al. eds., 1982) (emphasis added).

156. Walterscheid, *Within the Limits of the Constitutional Grant*, *supra* note 79, at 309–10.

157. *Id.*

158. *Id.* at 310.

159. Letter from Tench Coxe to James Madison (Mar. 21, 1790), in 13 THE PAPERS OF JAMES MADISON 111, 111–15 (Charles F. Hobson & Robert A. Rutland eds., 1981).

160. Walterscheid, *Within the Limits of the Constitutional Grant*, *supra* note 79, at 312 (explaining the contents of Madison’s response).

161. *Id.*

162. *Id.* at 310 (“The congressional record is totally silent as to why these deletions occurred.”).

Agriculture, commerce and Manufactures, by all proper means.”¹⁶³ Notably, he encouraged this to be done in part by “giving effectual encouragement . . . to the introduction of new and useful inventions from abroad.”¹⁶⁴

Alexander Hamilton, then serving as Secretary of the Treasury, appears to have leaned in the same direction. In 1790, Congress requested that Hamilton, in his official role, prepare a report on American industry and make recommendations on how to encourage further industrialization.¹⁶⁵ In developing his report, Hamilton “[n]aturally . . . consulted manufacturers who had successfully established factories,” and discovered that many of them had attained success by importing British inventions.¹⁶⁶ Unsurprisingly, when Hamilton delegated the drafting of the first iteration of the report to his Assistant Secretary of the Treasury, Tench Coxe, the resulting draft included various proposals meant to support industrialization in the United States, including a recommendation that Congress grant patents of importation.¹⁶⁷

Before providing the report to Congress, Hamilton reworked Coxe’s draft no fewer than five times, in the end “[coming] out strongly in favor of granting an inventor monopoly to the introducers of technology.”¹⁶⁸ At this juncture, the 1790 Patent Act had already been passed, albeit without authorizing patents of importation.¹⁶⁹ And yet, notwithstanding Madison’s constitutional objections, Hamilton — no less a Framers than Madison — advocated for revising the Patent Act of 1790 to adopt those methods “which ha[d] been employed with success in other Countries,” including, presumably, patents of importation.¹⁷⁰

At this point, Founding-era history falls away. We know that the First Congress, in passing the 1790 Patent Act, rejected patents of importation, which are still prohibited under today’s Patent Act. Yet, aside from vague murmurs about constitutional concerns, we have little idea why the proposals in the initial bill that would have permitted patents of importation were rejected. What we *do* know, however, is that the Intellectual Property Clause appears by its terms to permit patents of importation, and that Thomas Jefferson, in seeking a later amendment

163. George Washington, *From George Washington to the United States Senate and House of Representatives, 8 January 1790*, FOUNDERS ONLINE, <https://founders.archives.gov/documents/Washington/05-04-02-0361> [<https://perma.cc/D9P8-L5MY>] [hereinafter *First State of the Union*].

164. *Id.*

165. Doron Ben-Atar, *Alexander Hamilton’s Alternative: Technology Piracy and the Report on Manufactures*, 52 WM. & MARY Q. 389, 394 (1995).

166. *Id.* at 395 (“These men did not hide the fact that their success depended on their ability to pirate British technology, primarily by enticing skilled British artisans to emigrate.”).

167. *Id.* at 398–99 (describing three pro-industrialization proposals from Coxe’s first draft of the report).

168. *Id.* at 399, 403.

169. *Id.* at 403–04.

170. *Id.* at 404.

to limit the scope of the Clause, seems to have implicitly recognized as much. Likewise, we know that both George Washington and Alexander Hamilton implored Congress to authorize patents of importation. And we know that at least some members of the First Congress — those who drafted the later-deleted provisions authorizing Patents of Importation — considered them constitutional as well.

At worst, the question of whether the Constitution permits patents of importation, and, by extension, patents on AI-produced inventions, is historically ambiguous. And, as the following Parts show, analysis of the Intellectual Property Clause through other modalities, including prudential, doctrinal, and structural, reveals that Congress possesses full authority to issue patents on AI-produced inventions.

V. PRUDENTIAL

This Part adopts the prudential modality in interpreting the Intellectual Property Clause. The key inquiry under this modality is whether defining inventorship so as to permit patents on AI-produced inventions would comport with the basic policies embedded in the Intellectual Property Clause. To that end, this Part analyzes the Clause in light of the two predominant theoretical approaches to patent law, one based on utilitarian concerns and the other rooted in Locke's concept of natural rights.

The most common theoretical justification for patent law is utilitarian in nature. Patents are thought to incentivize the dissemination of knowledge and technology by allowing inventors to obtain a limited monopoly — and the associated financial rewards — in exchange for fully disclosing the claimed invention, which will enter into the public domain once the patent lapses.¹⁷¹ The same underlying rationale can be traced back to England's 1623 Statute of Monopolies, which presumptively prohibited all monopolies and yet permitted an exception for patents because they were a limited form of monopoly that served the public interest.¹⁷²

Thomas Jefferson, to the extent he approved of patents at all, subscribed to this rationale. When not busy decrying “the embarrassment of an exclusive patent,”¹⁷³ Jefferson spoke of patents in utilitarian terms that emphasized their potential for benefitting society. For instance, in an 1813 letter to Isaac McPherson, an inventor who sought Jefferson's

171. See, e.g., *Eldred v. Ashcroft*, 537 U.S. 186, 225 (2003) (Stevens, J., dissenting) (“The issuance of a patent is appropriately regarded as a *quid pro quo* — the grant of a limited right for the inventor's disclosure and subsequent contribution to the public domain.”).

172. See *supra* note 90 (explaining that the Statute of Monopolies recognized that limited-term patents were a permissible monopoly because of the public benefit they could provide).

173. Letter from Thomas Jefferson to Isaac McPherson (Aug. 13, 1813), in 13 THE WRITINGS OF THOMAS JEFFERSON 326, 335 (Andrew A. Lipscomb ed., 1905).

assistance in a pending patent infringement lawsuit, Jefferson wrote that:

Stable ownership is the gift of social law, and is given late in the progress of society. It would be curious then, if an idea, the fugitive fermentation of an individual brain, could, of natural right, be claimed in exclusive and stable property. If nature has made any one thing less susceptible than all others of exclusive property, it is the action of the thinking power called an idea, which an individual may exclusively possess as long as he keeps it to himself; but the moment it is divulged, it forces itself into the possession of every one, and the receiver cannot dispossess himself of it Inventions then cannot, in nature, be a subject of property. Society may give an exclusive right to the profits arising from them, as an encouragement to men to pursue ideas which may produce utility, *but this may or may not be done, according to the will and convenience of the society, without claim or complaint from anybody.*¹⁷⁴

In other words, Jefferson treated patents solely as a bargained-for entitlement granted in the public interest, not as an inherent right of the inventor. Over time, the Supreme Court has adopted Jefferson’s utilitarian view of intellectual property rights.¹⁷⁵ In *Graham v. John Deere Co.*, the Court “quoted liberally from Jefferson’s correspondence” discussing his views on patent law — particularly his 1813 letter to McPherson¹⁷⁶ — to justify a utilitarian approach to interpreting a provision of the 1952 Patent Act.¹⁷⁷ Although the discussion in *Graham* of Jefferson’s views on patent law was arguably dicta, the Court has on two subsequent occasions “reaffirmed its fealty to the Jeffersonian story of patent law.”¹⁷⁸ Consequently, it seems likely that patents, at least under the Supreme Court’s current approach, will be analyzed

174. *Id.* at 333–34 (emphasis added).

175. See, e.g., *Graham v. John Deere Co. of Kan. City*, 383 U.S. 1, 7, 11 (1966) (describing Jefferson as the “moving spirit” behind the implementation of the 1790 Patent Act and noting that he also authored the 1793 Patent Act).

176. For a discussion of how Jefferson’s letter became “part of the fundamental lore of American intellectual property,” see Jeremy N. Sheff, *Jefferson’s Taper*, 73 SMU L. REV. 299, 301–02 (2020).

177. Mossoff, *supra* note 125, at 960–62. The 1952 Patent Act provision that the Court was interpreting had nothing to do with patents of importation, but rather considered whether the Act required that a claimed invention not be “obvious . . . to a person having ordinary skill in the art.” *Graham*, 383 U.S. at 3 (citing 35 U.S.C. § 103 (1964)).

178. Mossoff, *supra* note 125, at 961 n.40 (citing cases in which the Court drew on Thomas Jefferson’s views on patent law in interpreting the Patent Act).

primarily in utilitarian terms, with any interest an inventor might possess in owning their intellectual output taking a back seat to the broader societal interest in the dissemination of knowledge and technology.¹⁷⁹

Some scholars, however — most notably Professor Adam Mossoff — dispute the prevailing utilitarian view.¹⁸⁰ Professor Mossoff suggests that patents, by the time the Constitution was enacted, amounted to property rights to which the inventor was inherently entitled.¹⁸¹ In his view, the use of the term “privilege” in early American patent law is merely a holdover from the label used for the manufacturing monopolies historically granted by the English Crown, which were true privileges.¹⁸² Although Professor Mossoff understands why the Court took to Jefferson’s “forward looking” and utilitarian view of patents,¹⁸³ he argues that courts have relied on an “anachronistic reading of the historical record.”¹⁸⁴

Specifically, Professor Mossoff criticizes courts for overlooking that “privileges” in the eighteenth and nineteenth centuries referred to individual rights secured by civil society.¹⁸⁵ Indeed, he argues that the use of the term “privileges” by some of the Founders in referring to patents can only be understood contextually and that the Founders would have assumed their audiences would understand this rights-based meaning “in its relevant textual context.”¹⁸⁶ As he would have it,

179. *See id.* at 962 (noting that “[Jefferson] forcefully advanced the utilitarian and economic justification of the patent system [that is] the primary justification for patents today”).

180. *See id.* at 965–66 (criticizing Walterscheid and others for “repeatedly reaffirm[ing] the Jeffersonian story of patent law” and ignoring evidence that “natural rights philosophy influenced early patent law doctrine”).

181. *See generally id.* for a discussion of individual property rights in the copyright context, *see also* Stephen Schahrer, Note, *First, Let Me Take a Selfie: Should a Monkey Have Copyrights to His Own Selfie?*, 12 LIBERTY U. L. REV. 135, 150 (2017) (“To equate the private interest . . . to merely the economic benefit that accumulates to [a creator] . . . is to miss the fundamental foundation of the American property law tradition: individual property rights.”).

182. *See* Mossoff, *supra* note 125, at 967–68 (“Despite [the] change in the subject matter of patent grants — from manufacturing monopolies secured by royal grant to novel and useful inventions secured by statute — courts and other institutional actors continued to refer to patents as ‘privileges.’”).

183. *See id.* at 962 (“Jefferson’s compelling rhetoric, such as comparing ideas to an inexhaustible flame that spreads the light of understanding throughout the world, is moving in a way that an abstract economic lesson in public goods or free-riding behavior is not.”); *see also id.* at 969 (“The appeal of the Jeffersonian story of patent law is somewhat understandable because in Standard English today, ‘privilege’ is an antonym of ‘right.’”).

184. *See id.* at 968–69 (discussing present-day misunderstanding of what was meant by the patent “privilege” in the eighteenth and nineteenth centuries). Even the Jeffersonian story of patents may itself constitute a misreading of the history. *See id.* at 1012 (“In reviewing primary historical sources in the eighteenth and nineteenth centuries, it is apparent that the Jeffersonian story of patent law is a historical myth.”).

185. *Id.* at 968.

186. *Id.*; *see also id.* at 970 (“[That ‘privilege’ might have a legal meaning different from lay understanding] is neither a novel nor remarkable insight. The use of ‘privilege’ as a legal term of art is omnipresent in the eighteenth century, as evidenced by early American colonial and state constitutions.”); *id.* at 990 (“Indeed, Congress and courts construed patents as

then, patents are not merely a bargained-for entitlement but are instead an inviolable right of the inventor — on par with any natural right¹⁸⁷ — that Congress is bound to protect.

privileges: they were civil rights in property afforded expansive and liberal protection under the law.”).

187. Mossoff’s rights-based theory of the Intellectual Property Clause is rooted in Locke’s concept of the social contract, which assumed that, by “entering into civil society,” an individual would “enjoy many Conveniences, from the labour, assistance, and society of others in the same Community.” *Id.* at 971 (quoting JOHN LOCKE, TWO TREATISES OF GOVERNMENT § 130, at 353 (Peter Laslett ed., Cambridge Univ. Press 1988) (1690)). Thus, “in creating civil society, individuals not only secured the protection of their natural rights but gained a litany of other rights that defined their freedoms relative to their new fellow citizens and public institutions.” *Id.* Blackstone referred to such “civil rights” as “civil privileges.” *Id.* at 972 (citing 1 WILLIAM BLACKSTONE, COMMENTARIES *125). Some were tremendously important, such as a criminal defendant’s right to confront witnesses and self-represent in court. *See id.* at 970–72. Thus, the use of the term “privileges” was not dispositive of whether an individual was entitled to a particular benefit. *See id.* at 971 (“Revolutionary Americans, influenced by Lockean ideals concerning the social contract and natural rights, certainly did not think that the rights of confrontation and self-representation in court were merely special benefits doled out by their governments!”).

This blending of meaning between privileges (civil rights) and immunities (natural rights) might have resulted from the intertwined nature of the two concepts in social contract doctrine. *See id.* at 972. Blackstone, for instance, recognized property as an “absolute” natural right but also acknowledged associated “civil advantages,” such as formal property titles and contractual means of conveying property. *See id.* (quoting 1 WILLIAM BLACKSTONE, COMMENTARIES *138). The use of the term “privileges” to describe civil rights was apparently ubiquitous. George Washington, welcoming Irish immigrants to New York City in 1783, stated that the “bosom of America [was] open to . . . the oppressed and persecuted of all Nations And Religions; whom we shall welcome to a participation of all our rights and privileges.” *Id.* at 973 (quoting Letter from George Washington to The Members of the Volunteer Association and Other Inhabitants of the Kingdom of Ireland Who Have Lately Arrived in the City of New York (Dec. 2, 1783), in 27 THE WRITINGS OF GEORGE WASHINGTON FROM THE ORIGINAL MANUSCRIPT SOURCES, 1745–1799, at 253, 254 (John C. Fitzpatrick ed., 1938)). Similarly, Madison, in introducing the tentative Bill of Rights to Congress, presented its proposed provisions as protecting both civil and natural rights. *Id.* at 973–74. He noted, for example, that “[t]rial by jury cannot be considered as a natural right, but a right resulting from a social compact[,] which regulates the action of the community, but is as essential to secure the liberty of the people as any one of the pre-existent rights of nature.” *Id.* at 974 (quoting 1 ANNALS OF CONGRESS 454 (Joseph Gales ed., 1789)).

Consequently, in Mossoff’s view, Madison’s comments in Federalist Paper No. 43 support a rights-based theory of the patent power. *Id.* at 981–82. According to Mossoff, Madison claimed that patents “[were] justified by ‘equal reason[s]’ as common law copyrights.” *Id.* (quoting THE FEDERALIST NO. 43 (James Madison)). And common law copyrights were apparently recognized as common law rights on par with natural rights — that is, they were a form of Blackstone’s civil privileges. *See id.* (“By the late eighteenth century, it was well known that common law rights were tantamount to natural rights.”). Thus, in equating the justifications for patents with those for copyrights — notwithstanding the different treatment of patents and copyrights at common law, *see id.* (“Madison was not alleging that patents were secured at common law, which he certainly knew to be false . . .”) — Madison arguably embraced a natural rights theory of patent law. *See id.* at 982 (“Madison’s justification for patent rights as privileges (civil rights) becomes even clearer once one recognizes the eighteenth-century justification for securing copyrights at common law: the labor theory of property of natural rights philosophy. Several states had already enacted statutes protecting copyrights on the ground that ‘there being no property more peculiarly a man’s own than that which is produced by the labour of his mind.’”) (quoting COPYRIGHT ENACTMENTS OF THE UNITED STATES, 1783–1906, at 14, 18–19 (Thorvald Solberg ed., rev. 2d ed. 1906)).

From a purely archaeological perspective, it might be impossible to determine whether Mossoff's rights-based view of the patent power¹⁸⁸ or the utilitarian view promoted by Thomas Jefferson — and embraced by the Supreme Court¹⁸⁹ — is more historically accurate. Under a prudential, policy-based analysis, however, the distinction is probably inconsequential.

On the one hand, under a utilitarian theory, an underlying principle of the patent power is to create a means of making inventions accessible to society at large.¹⁹⁰ Given the increasing relevance of AI to inventive endeavors,¹⁹¹ a utilitarian view of patent law likely supports a broad view of “Inventors.” As a matter of pure common sense, granting patents on AI-produced inventions would arguably incentivize the further development and ongoing deployment of inventive AI systems.¹⁹² What's more, issuing patents in this context could, in the long term, help introduce AI-produced inventive output into the public domain by requiring full disclosure of the claimed invention. In theory, the alternative (that is, not awarding patents) would instead encourage those parties that employ AI systems to hide the AI's output in hopes of obtaining trade secret protection, thus keeping inventions out of the public domain.¹⁹³

188. *See id.* at 976 (“[T]he logic of the Jeffersonian story of patent law . . . requires one to conclude that Blackstone, Washington, Madison, Hamilton, and Chief Justice Marshall viewed rights of property conveyance and contract as specially conferred grants from the government lacking any basis in moral or legal right These observations establish a basic historiographical requirement: the [Intellectual Property] Clause . . . should be construed in the same historical context as other constitutional and legal doctrines of the eighteenth and nineteenth centuries.”).

189. *See, e.g.,* *Graham v. John Deere Co. of Kan. City*, 383 U.S. 1, 7–11 (1966). Mossoff asserts, however, that the Supreme Court's decision in *Wheaton v. Peters* implicitly treated patents and copyrights as “on par with . . . civil rights derived from the social compact” insofar as it embraced a labor theory of property as a justification for statutory copyright protections. Mossoff, *supra* note 125, at 988 (“[T]he *Wheaton* Court adopt[ed] Webster's appeal to the labor theory of property . . . and then us[ed] this labor theory to justify securing copyright by statute: ‘That every man is entitled to the fruits of his own labor must be admitted’”) (quoting *Wheaton v. Peters*, 33 U.S. (8 Pet.) 591, 658 (1834)).

190. *See, e.g.,* *Gayler v. Wilder*, 51 U.S. (10 How.) 477, 497 (1850) (“[K]nowledge and use . . . mean[s] knowledge and use existing in a manner accessible to the public.”).

191. *See supra* Part I.

192. *See, e.g.,* *Abbott*, *supra* note 42, at 1104 (“[T]reating computational inventions as patentable and recognizing creative computers as inventors would be consistent with the Constitutional rationale for patent protection. It would encourage innovation under an incentive theory.”). Of course, we do not agree with Abbott's conclusion that AI systems should be deemed inventors — we think they constitutionally cannot be — but issuing patents on AI-generated inventions (albeit to various natural persons) would arguably still be consistent with the incentive theory of patent law.

193. To be clear, it is not certain that issuing patents on AI-generated inventions is needed to further incentivize the development of such systems. Researchers at the Max Planck Institute for Innovation and Competition doubt this position, reasoning that there has been a “surge of patenting activity claiming AI techniques and applications,” even without specific adaptations of the patent laws to account for AI-generated inventions. Daria Kim, Josef Drexler, Reto

Admittedly, Professor Mossoff’s rights-based theory is less obviously supportive of patenting an AI-produced invention than is the utilitarian approach. It’s unlikely that many people would believe that an AI, although the literal creator of a claimed invention, could possess any natural rights to its own output.¹⁹⁴ Even so, a rights-based approach to the Intellectual Property Clause doesn’t foreclose issuing patents on an AI system’s inventive output. After all, AI systems come into existence only as a product of human efforts; a fair argument can be made that the creator of an AI system, having mixed his or her labor into the AI itself by creating it, would also deserve rights with respect to any future output of the AI system, not unlike an orchard keeper who owns the fruit produced by the trees he plants.¹⁹⁵ Furthermore, as our Conclusion suggests,¹⁹⁶ an AI’s processes are inevitably set into motion only through the efforts of various natural persons, each of whom might arguably be entitled to the AI’s eventual output.¹⁹⁷

In sum, regardless of which view of the Intellectual Property Clause one accepts, there are strong prudential arguments that AI-produced inventions warrant patent protection. That said, it seems likely that under the Supreme Court’s current approach to patent law, the utilitarian view — which more clearly favors patents on AI-produced inventions — would prevail.¹⁹⁸ What’s more, regardless of which underlying policy one applies under the prudential analysis, the other modalities cumulatively tip the balance in favor of issuing patents on AI-produced inventions.

M. Hilty & Peter R. Slowinski, *Artificial Intelligence Systems as Inventors?* 9 (Max Planck Inst. for Innovation and Competition Rsch. Paper Series, No. 21-20, 2021).

194. For a discussion of whether sufficiently advanced robots deserve constitutional rights, see R. George Wright, *The Constitutional Rights of Advanced Robots (and of Human Beings)*, 71 ARK. L. REV. 613 (2019) (concluding that they would not).

195. Granting the inventor of an AI system the right to that system’s later inventive output would be consistent with the property law doctrine of accession, under which “title [is granted] to some resource based on its relationship to something that is already owned.” Peter Lee, *The Accession Insight and Patent Infringement Remedies*, 110 MICH. L. REV. 175, 195 (2011). For example, this doctrine “explains why farmers own the crops that grow on their soil” and why the “owner of a female domesticated animal also owns whatever offspring that animal produces.” *Id.*

196. See *supra* Part IV.

197. See *supra* Part IV.

198. See, e.g., Kasner, *supra* note 88, at 28, 31–32 (“The Court has interpreted the ‘constitutional command’ of the Patent Clause preamble quite powerfully. ‘Innovation, advancement, and things which add to the sum of useful knowledge are inherent requisites’ of a patent system built upon the preambular statement of purpose.”) (arguing that the Leahy-Smith America Invents Act’s (“AIA”) first-to-file provision is constitutional because it serves the utilitarian aims of the preamble).

VI. DOCTRINAL

Quite apart from any conclusions we might draw from a historical or prudential analysis, there's also a body of well-developed patent doctrine that can inform our understanding of the constitutional scope of inventorship. This Part therefore engages in a doctrinal analysis that evaluates the AI inventorship question in light of existing law.

On balance, the federal courts have shown great deference to Congress's decisions on how to implement intellectual property protections. Indeed, the Supreme Court has said that "[w]ithin the limits of the constitutional grant, the Congress may . . . implement the stated purpose of the Framers by selecting the policy which in its judgment best effectuates the constitutional aim."¹⁹⁹ Professor Jane Ginsburg likewise suggests that "whatever the Supreme Court's prior interpretations of the [Intellectual Property] Clause, Congress may nonetheless supply the content of that clause . . . Congress should enjoy substantial discretion in implementing its constitutional prerogative to 'promote the Progress of [useful arts].'"²⁰⁰

This is not to say that Congress has unlimited authority in interpreting the Intellectual Property Clause — as early as 1833, members of the Supreme Court suggested otherwise.²⁰¹ Still, the federal courts have allowed Congress considerable latitude in this regard,²⁰² and Congress has taken the opportunity to interpret the Intellectual Property Clause quite broadly.²⁰³ For instance, in its 1996 amendments to the Patent Act, Congress arguably did away with the nonobviousness requirement for certain biotechnological processes by deeming the process itself to be nonobvious (even if it otherwise would be deemed

199. Holbrook, *supra* note 81, at 7 (quoting *Graham v. John Deere Co. of Kan. City*, 383 U.S. 1, 6 (1966)).

200. Jane C. Ginsburg, *No "Sweat"? Copyright and Other Protection of Works of Information After Feist v. Rural Telephone*, 92 COLUM. L. REV. 338, 375 (1992).

201. Robert P. Merges and Glenn H. Reynolds, *The Proper Scope of the Copyright and Patent Power*, 37 HARV. J. ON LEGIS. 45, 47–48 (2000) (quoting JOSEPH STORY, COMMENTARIES ON THE CONSTITUTION OF THE UNITED STATES § 559 (Ronald D. Rotunda & John E. Nowak eds., 1987)) ("It has been doubted, whether [C]ongress has authority to decide the fact, that a person is an author or inventor in the sense of the [C]onstitution, so as to preclude that question from judicial inquiry."):

202. *See* Ginsburg, *supra* note 200, at 376 ("In the context of the [Intellectual Property] Clause, the Court had earlier announced considerable deference to congressional definition of the content and scope of the limited monopoly . . ."). Prominent constitutional scholars assert that the Supreme Court adopts a generally deferential posture toward Congress with respect to the scope of Article I's legislative power. *See, e.g.*, LAURENCE H. TRIBE, AMERICAN CONSTITUTIONAL LAW 297 (2d ed. 1988) (emphasis omitted) ("The Supreme Court has in recent years largely abandoned any effort to articulate and enforce internal limits on congressional power — limits inherent in the grants of power themselves."):

203. *See, e.g.*, Holbrook, *supra* note 81, at 7 (noting that, in enacting the Plant Patent Act, Congress determined that "inventor" could be given a sufficiently expansive meaning so as to treat the discoverer of a particular plant variety as its inventor).

obvious) so long as the composition of matter resulting from that process is itself novel and nonobvious.²⁰⁴ And another statute permits patents to be issued directly to the federal government for inventions produced pursuant to contracts with the National Aeronautics and Space Administration, bypassing the usual rule that a patent issues first to a natural person inventor or inventors, becoming thereafter freely assignable.²⁰⁵

Case law suggests, however, that if there is to be any limitation on Congress’s authority to determine the meaning of “Inventor,” the term cannot be construed so as to contemplate non-human actors. The Federal Circuit, for instance, has held that both corporations and sovereigns cannot be deemed inventors.²⁰⁶ Admittedly, this is in some tension with copyright law’s work-for-hire doctrine, under which the employer of an individual who produces a copyrightable work when acting within the scope of employment is deemed the work’s author.²⁰⁷ Judicial opinions have sometimes commented on the propriety of the work-for-hire doctrine, but none have definitively resolved its constitutionality.²⁰⁸ Dicta in various opinions, though, has suggested that the doctrine is not constitutionally problematic.²⁰⁹ On its face, this might suggest that even deeming an AI to be an inventor would be constitutionally permissible.

However, we think this conclusion is unmerited. First, even if the work-for-hire doctrine is constitutionally permissible,²¹⁰ it has as of yet

204. See Heald & Sherry, *supra* note 93, at 1184 (arguing that the 1996 Patent Act amendments “eliminated the nonobviousness requirement for some biotechnological processes”); see also Walterscheid, *Within the Limits of the Constitutional Grant*, *supra* note 79, at 322 (“Congress . . . has not interpreted *Graham* as setting forth a constitutional requirement for nonobviousness.”).

205. See Heald & Sherry, *supra* note 93, at 1191 (“[G]iven the historically broader meaning of the word ‘Inventor’ likely understood by the framers, it is not difficult to construe the federal government — as a funder of creativity for the realm — as an ‘Inventor’ in the constitutional sense.”) (discussing 42 U.S.C. § 2457 (1994)). To be clear, this statute does not define the federal government as the “Inventor” in explicit terms, but it does bypass the presumption that a patent issues first to a natural person inventor or inventors, and only thereafter becomes a property right that may be assigned to other entities possessing legal (if not actual) personhood. See 42 U.S.C. § 2457(a) (1994).

206. See, e.g., *Univ. of Utah v. Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V.*, 734 F.3d 1315, 1323 (Fed. Cir. 2013) (holding that “inventors must be natural persons and cannot be corporations or sovereigns”). This is the prevailing view in the Copyright Office, although the Supreme Court hasn’t yet addressed this issue. See Abbott, *supra* note 42, at 1099 (“[S]ince at least 1984 the Copyright Office has conditioned copyright registration on human authorship.”).

207. See 17 U.S.C. § 101 (defining work made for hire as including “a work prepared by an employee within the scope of his or her employment”).

208. Walterscheid, *Within the Limits of the Constitutional Grant*, *supra* note 79, at 306.

209. See, e.g., *Childress v. Taylor*, 945 F.2d 500, 506 n.5 (2d Cir. 1991) (“Though the United States is perhaps the only country that confers ‘authorship’ status on the employer of the creator of a work made for hire . . . its decision to do so is not constitutionally suspect.”).

210. Not every scholar agrees that the work-for-hire doctrine is constitutional. Walterscheid writes that “[i]t . . . took a massive legal fiction for Congress to declare that for copyright purposes the employer is an author of a work made for hire.” Walterscheid, *Within the*

been limited to legal persons — such as corporations — created, sustained, and operated by natural persons. It might therefore be a bridge too far to suggest that an AI could constitutionally be deemed an inventor. Furthermore, the implications of the work-for-hire doctrine with respect to the patent power are cloudy at best, given that the copyright and patent powers are not always interpreted in parallel, despite originating from the same clause.²¹¹ One scholar forcefully rejects the concept of a work-for-hire equivalent in the patent realm.²¹²

That said, assessing whether a non-human entity such as an AI can obtain a patent in its own right is not the same as assessing whether an AI-produced invention has an inventor for constitutional purposes.²¹³ It seems likely that it does. As previously discussed, the term “Inventor” at common law was broad enough to accommodate one who merely introduced an invention to the realm.²¹⁴ Likewise, the Founders discussed the patent power primarily in utilitarian terms.²¹⁵ To the extent that Supreme Court precedent embraces a utilitarian theory as the underlying rationale of U.S. patent law, this supports issuing a patent on AI-produced inventions so long as doing so can incentivize further innovation.

Importantly, an existing patent doctrine seems to occasionally award rights to those individuals who are, at least in a colloquial sense,

Limits of the Constitutional Grant, *supra* note 79, at 305. In the same vein, Patterson and Lindberg contend that “the reasons that make the work-for-hire doctrine unconstitutional are the very reasons that make it a convenient and powerful instrument of monopoly.” L. RAY PATTERSON & STANLEY W. LINDBERG, *THE NATURE OF COPYRIGHT: A LAW OF USERS’ RIGHTS* 86 (1991).

211. Walterscheid, *The Nature of the Intellectual Property Clause*, *supra* note 128, at 779–80 (“[The] combination of two separate and distinct grants of authority in one clause raises the question of whether the Framers contemplated any distinction between the rights granted to inventors and those granted to authors [D]istinctions had clearly developed under the common law [and] . . . would be incorporated in the new United States patent and copyright law authorized by the constitutional language.”). For instance, a work-for-hire equivalent might not be accepted in the patent realm. In *z4 Technologies, Inc. v. Microsoft Corp.*, the Federal Circuit expressly declined to decide whether a corporation could be an inventor, although it noted the district court’s concern that a corporation could not meet patentability’s conception requirement. 507 F.3d 1340, 1354 (Fed. Cir. 2007).

212. See Walterscheid, *Within the Limits of the Constitutional Grant*, *supra* note 79, at 355 (“[A]ny attempt by Congress by legal fiction to define an assignee of a patent right as an inventor would be constitutionally suspect at best.”).

213. Interestingly, the Ninth Circuit has addressed whether an animal can be an author. In *Naruto v. Slater*, PETA sued on behalf of a monkey, Naruto the crested macaque, alleging copyright infringement of a selfie that he had taken with a pilfered camera. 888 F.3d 418, 420 (9th Cir. 2018). The Ninth Circuit did not address whether the Constitution permits nonhuman authorship. It instead concluded that authorship as defined in the Copyright Act is limited to humans and that Naruto therefore lacked statutory standing under the Act. See *id.* at 426.

214. See *supra* notes 90–98 and accompanying text (discussing the English practice of granting patents of importation).

215. See *supra* notes 175–79 and accompanying text (discussing how the Supreme Court adopted Jefferson’s utilitarian approach to patent law).

not the creator of a claimed invention.²¹⁶ As Professor Dan Burk has noted, earlier technologies have posed a problem similar in some respects to that posed by AI, in that they produce products that are unforeseen and unforeseeable.²¹⁷ He concludes — correctly, we believe — that AI systems cannot be inventors because they fail patent law’s conception requirement.²¹⁸ Conception requires “formation in the mind of the inventor of a definite and permanent idea of the complete and operative invention as it is thereafter to be applied in practice.”²¹⁹ It follows that AI systems are incapable of conception because they lack a mind in the conventional sense.²²⁰

Professor Burk points to an easy doctrinal solution for this problem — “the doctrine of simultaneous conception and reduction to practice.”²²¹ Under this doctrine, when the inventor “does not or cannot imagine the form of the invention in advance of actually having reduced the invention to practice . . . the invention is conceived when it is recognized by the inventor.”²²² Thus, in the case of biotechnologies — such as hybridomas, fusions of cancerous and normal cells used to produce medically valuable antibodies — that yield useful outputs (i.e., inventions) only unpredictably, it is the individual who identifies the useful outputs who is deemed the inventor.²²³ Of course, this individual did not come up with the invention, at least in the sense of having an “aha moment” prior to its creation, instead having merely set into motion the unpredictable process that ultimately led to the new invention. Nonetheless, this individual is considered an inventor by the grace of having noticed and therefore “conceived” the useful output of an unpredictable process.

While we agree that, under this doctrine, the Patent Act permits an individual who is not the creator (at least in any colloquial sense) of a claimed invention to nevertheless claim inventorship, this does not fully resolve the issue of whether Congress may *constitutionally* issue patents on AI-produced inventions. Those decisions applying the

216. When we say “in a colloquial sense,” we are distinguishing the formal legal construct of inventorship from how the term might be commonly understood. For example, it seems dubious to call Thaler an inventor when, if his assertions are taken as true, he did nothing more than push DABUS’s “start” button to produce patentable inventions. USPTO, *Thaler Decision*, *supra* note 7, at 3–5.

217. Burk, *supra* note 20, at 303–05 (identifying prior technologies that “lead to unexpected but valuable products and byproducts,” including “[o]rganic synthesis, mutagenesis, cell transformation, [and] cell fusions”).

218. *Id.* at 306–07.

219. *Townsend v. Smith*, 36 F.2d 292, 295 (C.C.P.A. 1929).

220. *See* Burk, *supra* note 20, at 307 (“Because the machine has no mind in which an idea of the complete and operative invention can be conceived, the machine by definition cannot be an inventor.”).

221. *Id.* at 308.

222. *Id.*

223. *Id.*

simultaneous conception and reduction to practice doctrine are interpreting the Patent Act, not the Constitution.²²⁴ By contrast, we address whether there is a constitutional basis for issuing a patent to a natural person for an invention that individual did not create in the colloquial sense of having “produce[d] [an invention] for the first time through the use of the imagination or of ingenious thinking and experiment.”²²⁵

The simultaneous conception and reduction to practice doctrine presupposes that conception can occur after an invention has already been physically realized. But one might well wonder whether AI systems are presently or will in the future reduce the level of human discernment necessary to identify patentable inventions such that it is questionable whether any human conceived of the invention in a meaningful sense. And if that’s the case, a necessary follow-up inquiry would be whether Congress may eliminate the conception requirement entirely. We take no position on this, however, merely raising it as a point for future inquiry. The modalities show that Congress may constitutionally issue patents on AI-produced inventions, and whether that authority results merely from a low (but still existent) constitutional threshold for what constitutes conception or from conception not being a constitutional requirement at all, the result is the same.

That said, the existence of the simultaneous conception and reduction to practice doctrine supports issuing patents on AI-produced inventions, albeit only to natural persons. Presumably, the federal courts would not have developed this doctrine if they believed that the colloquial-sense creation of an invention was constitutionally required for an individual to receive a patent. This, coupled with the federal courts’ traditional deference to Congress when articulating the scope of the Intellectual Property Clause, suggests that Congress could, if it wanted, construe “Inventors” broadly enough to accommodate patents for AI-produced inventions. The next Part considers whether any structural limitations, either inherent in the Intellectual Property Clause or in its relationship to other constitutional provisions, would limit Congress’s discretion in this regard.

VII. TEXTUAL

We turn now to the textual modality. Various scholars have suggested that the textual structure of the Intellectual Property Clause limits what would otherwise be plenary congressional authority with regard to issuing patents and copyrights. One viewpoint suggests that

224. See, e.g., *Amgen, Inc. v. Chugai Pharm. Co.*, 927 F.2d 1200 (Fed. Cir. 1991) (applying this doctrine in the context of 35 U.S.C. § 102(g), which focuses on the date of first conception).

225. *Invent*, MERRIAM-WEBSTER, <https://www.merriam-webster.com/dictionary/invent> [<https://perma.cc/6H45-TUT6>].

the primary limitation on the Clause’s grant of authority exists in the Preamble, “[t]o promote the Progress of . . . useful Arts.”²²⁶ Thus, although Congress has broad authority to determine the contours of who counts as an inventor and what constitutes “limited Times” or “Discoveries,” it loses all authority to issue patents and copyrights when doing so would not promote progress.²²⁷

A second view posits that it is instead the latter half of the Clause — “by securing for limited Times²²⁸ to . . . Inventors the exclusive Right to their . . . Discoveries”²²⁹ — that serves as its primary limiting function. Under this view, the tail end of the Clause establishes constitutional criteria for patentability, whereas the Preamble grants Congress broad authority to promote progress that includes, but is not limited to, issuing patents and copyrights.²³⁰ This interpretation would permit Congress to promote progress by other means — such as sponsoring research — when a patent is constitutionally barred by the limitations inherent in the latter half of the Clause.

Finally, a third approach suggests that *both* halves of the Clause serve to constrain Congress’s intellectual property power. The limiting principle here is that Congress can promote progress *only* by issuing patents and copyrights, with the Clause as a whole prohibiting Congress from promoting progress through any other means, including through the use of its other enumerated powers.²³¹

This Part considers whether any of these three viewpoints might, if accepted as true, constrain Congress’s ability to issue patents on AI-produced inventions. It concludes that they do not.

A. The Preamble as a Limitation

Professor Dotan Oliar views the Intellectual Property Clause’s Preamble as limiting Congress’s patent power.²³² Thus, under his reading of the Clause, a law or act that fails to “promote the Progress of . . .

226. U.S. CONST. art. I, § 8, cl. 8.

227. See *infra* notes 232–45 and accompanying text (detailing why certain scholars believe the Preamble limits the scope of Congress’s intellectual property authority).

228. For the purposes of this Article, we’ll ignore the “limited Times” portion of the Clause, which would not obviously apply any differently to AI-produced inventions than it does to other inventions.

229. U.S. CONST. art. I, § 8, cl. 8.

230. See *infra* notes 248–51 and accompanying text.

231. See *infra* notes 255–63 and accompanying text.

232. See Dotan Oliar, *Making Sense of the Intellectual Property Clause: Promotion of Progress as a Limitation on Congress’s Intellectual Property Power*, 94 GEO. L.J. 1771, 1776–77 (2006) (arguing that “the Framers intended the [Preamble] as a limitation on Congress’s intellectual property power”); see also Holbrook, *supra* note 81, at 21 (acknowledging the Preamble as a limitation on Congress’s intellectual property authority, but viewing it as only a “slight” limit).

useful Arts”²³³ is unconstitutional. The Supreme Court, however, has not clearly decided this issue.²³⁴

In *Eldred v. Ashcroft*, the petitioners argued that the retroactive extension of a copyright term could not “promote the Progress of Science”²³⁵ because no further creativity could be incentivized on works that had already been created.²³⁶ The petitioners had lost in the D.C. Circuit, which relied on its earlier decision in *Schnapper v. Foley* to “reject[] the argument ‘that the introductory language of the . . . Clause constitutes a limit on Congressional power.’”²³⁷ Judge Sentelle, however, agreed with the petitioners. In dissent, he insisted that “[t]he clause [was] not an open grant of power to secure exclusive rights . . . [but rather] a grant of power to promote progress.”²³⁸ As Professor Holbrook concisely stated, for Judge Sentelle *Schnapper* stood only for the proposition that the copyright system as a whole — rather than any particular copyright issued — must promote progress, “not that Congress had limitless power to adopt any system” it desired.²³⁹

On review, the Supreme Court never addressed whether the Intellectual Property Clause’s Preamble limits congressional authority. Instead, the Court produced a narrower holding by finding that “[t]he justifications that motivated Congress to enact the [copyright extension] . . . provide[d] a rational basis for concluding that [the extension] ‘promote[d] the Progress of Science.’”²⁴⁰

233. U.S. CONST. art. I, § 8, cl. 8.

234. *See, e.g.*, Holbrook, *supra* note 81, at 14 (“The courts have not decided conclusively . . . the extent to which the phrase ‘promote the Progress’ limits Congress’s legislative powers.”). However, language in some of the Court’s earlier opinions does hint that the Preamble might act as a substantive limitation on the authority granted by the Clause. *See, e.g.*, *Graham v. John Deere Co. of Kan. City*, 383 U.S. 1, 5–6 (1966) (quoting U.S. CONST. art. I, § 8, cl. 8) (“The Congress in the exercise of the patent power may not overreach the restraints imposed by the stated constitutional purpose . . . Innovation, advancement, and things which add to the sum of useful knowledge are inherent requisites in a patent system which by constitutional command must ‘promote the Progress of . . . useful Arts.’”).

235. U.S. CONST. art. I, § 8, cl. 8.

236. *See* Brief for Petitioner at 21–22, *Eldred v. Ashcroft*, 537 U.S. 186 (2003) (No. 01-618); *see also* Holbrook, *supra* note 81, at 14–15.

237. *Eldred v. Reno*, 239 F.3d 372, 378 (D.C. Cir. 2001) (quoting *Schnapper v. Foley*, 667 F.2d 102, 112 (D.C. Cir. 1981)). It is important to note that *Eldred* was a copyright case — not a patent case — and so it’s not directly indicative of whether the Intellectual Property Clause as a whole constrains the use of other enumerated powers to achieve patent-like results. Still, “promote the Progress” modifies both “Science” and “the useful Arts,” and so while what constitutes progress may differ between the two (probably defined by originality in copyright, and by nonobviousness and novelty in patent law), the directive to promote progress is likely to serve as a limitation, if at all, on the use of both powers. *See* U.S. CONST. art. I, § 8, cl. 8. It is beyond the scope of this Article to assess the precise contours of how such limitations might play out in copyright and patent law.

238. Holbrook, *supra* note 81, at 15 (quoting *Eldred*, 239 F.3d at 381 (Sentelle, J., dissenting)).

239. *Id.* (citing *Eldred*, 239 F.3d at 382–83 (Sentelle, J., dissenting)).

240. *Id.* at 16 (alteration in original) (quoting *Eldred v. Ashcroft*, 537 U.S. 186, 213 (2003)).

The Court has occasionally hinted that the Preamble might limit Congress’s intellectual property authority, at least with respect to patents. For instance, in *Graham v. John Deere Co.*, the Court described the Intellectual Property Clause as “both a grant of power and a limitation” in holding that Congress could not “remove . . . [inventions] from the public domain.”²⁴¹ In the process, it implicitly tied this limitation to the Preamble when it stated that “[i]nnovation, advancement, and things which add to the sum of useful knowledge are inherent requisites in a patent system *which by constitutional command must ‘promote the Progress of . . . useful Arts.’*”²⁴²

Professor Holbrook also agrees with this view of the Preamble, although viewing it as a minor limit on the scope of the IP Clause, arguing that treating the Preamble as “merely prefatory or aspirational would write the words right out of the Constitution.”²⁴³ Still, he thinks that “[t]he threshold [for] establishing” whether a particular congressional action promotes progress is a low one, in part because the Constitution “does not detail” how much progress must be achieved.²⁴⁴ And, in light of this low bar, he believes that the Court “has granted Congress broad discretion in enacting [patent] legislation.”²⁴⁵

What impact would a Preamble-based limitation have on patenting AI-produced inventions? Most likely, very little. Even if the Preamble requires that patents be used to promote progress, every indication is that this is a low threshold for Congress to cross. Even at common law, it was recognized that adventurous capitalists would need incentives to invest time and money exploring the wider world in order to bring useful foreign technology back to Great Britain.²⁴⁶ There is no reason to think that modern-day capitalists, who develop and employ AI systems only at considerable cost,²⁴⁷ would not require economic incentives for doing so, thereby bringing new inventions to market. So long as patents on AI-produced inventions can incentivize the development and use of inventive AI systems, it seems likely that Congress will have succeeded in promoting progress within the meaning of the Intellectual Property Clause.

241. 383 U.S. 1, 5–6 (1966).

242. *Id.* at 6 (emphasis added).

243. Holbrook, *supra* note 81, at 17.

244. *Id.*

245. *Id.* at 20.

246. See Heald & Sherry, *supra* note 93 (“[Patents of importation] were awarded not to inventors but to capitalists who needed a special economic incentive to set up shop in the United Kingdom.”).

247. See *supra* note 14 and accompanying text (discussing the forecasted multibillion-dollar growth of the AI industry in the near future).

B. Limitations in the Latter Half of the Clause

Edward Walterscheid sees the latter half of the Intellectual Property Clause as constraining its power by imposing a constitutional requirement of novelty.²⁴⁸ In his view, the terms “inventors” and “discoveries” inherently require that a claimed invention be novel in order to be patentable.²⁴⁹ In reaching this conclusion, he draws on dictionary definitions of “inventors” and “discoveries” in the late 1700’s, which described an inventor as “one who produces something new; a deviser of something not known before” and discovery as “the act of finding anything hidden.”²⁵⁰ However, Walterscheid posits that novelty, though constitutionally required, would have had only the same scope that it did at common law — namely, that a claimed invention be “new in the realm,”²⁵¹ consistent with the definition that had permitted patents of importation.

This interpretation of the Clause poses no real obstacle to patenting AI-produced inventions. No doubt, “novelty” could be construed to require that an invention be the original creation of a natural person. But, as Walterscheid observes and as this Article earlier establishes,²⁵² novelty at the time the Intellectual Property Clause was adopted had a much narrower meaning. And, compared with patents of importation, AI-produced inventions are even less constitutionally suspect from a novelty perspective. If Thaler’s claims²⁵³ are any indication, an AI-produced invention will in most cases be truly novel, rather than representing the sort of technological piracy supported by English patents of importation.²⁵⁴

248. See Walterscheid, *Within the Limits of the Constitutional Grant*, *supra* note 79, at 306–18. Walterscheid also identifies several other structural limitations inherent in the Clause, including a constitutional requirement that the claimed invention have some utility (stemming from the preamble words “*useful arts*”); a requirement that claimed inventions be adequately disclosed to the public (i.e., enablement) so as to promote progress; and a requirement that a claimed invention fall within a limited range of patentable subject matter (delineated by the terms “inventions” and “discoveries”). See *generally id.* However, this Article limits itself to a discussion of his proposed constitutional novelty requirement, as the remaining limitations he identifies do not seem to apply any differently to AI-produced inventions than they do to other inventions.

249. See *id.* at 307.

250. *Id.* (citing Arthur Seidel, *The Constitution and a Standard of Patentability*, 48 PAT. OFF. SOC’Y 5, 13 n.17, 15 n.19 (1966)).

251. *Id.*

252. See *supra* notes 90–98 and accompanying text (discussing the English practice of granting patents of importation).

253. See *supra* notes 16–20 and accompanying text (noting Thaler’s assertion that DABUS conceived of both inventions claimed in his patent applications without human intervention).

254. See *supra* notes 90–98 and accompanying text (discussing the English practice of granting patents of importation).

*C. The Intellectual Property Clause as an External Constraint on
Other Enumerated Powers*

Several legal scholars assert that the Intellectual Property Clause imposes substantive limitations on the use of other Article I, Section 8 enumerated powers. Professor Paul Heald, for example, argues in a 1991 article that Congress may not rely on the Commerce Clause to issue the equivalent of copyrights on otherwise copyright-ineligible works, such as those failing to meet the originality standard articulated by *Feist Publications, Inc. v. Rural Telephone Service, Inc.*²⁵⁵ He reasons that, in establishing a constitutional standard for what *may* be copyrighted — original works of authorship — the Intellectual Property Clause also demands that all works falling short of that standard remain in the public domain.²⁵⁶ And so he predicts that to avoid “permit[ting] its perception of the framer’s vision of the public domain to be circumvented,” the Supreme Court would find it unconstitutional to use the Commerce Clause to achieve results at odds with the purposes of the Intellectual Property Clause.²⁵⁷ Heald finds doctrinal support for this position, pointing to *Railway Labor Executives Ass’n v. Gibbons*, in which the Supreme Court held that Congress, which may enact only “uniform” bankruptcy laws,²⁵⁸ could not rely on the Commerce Clause to authorize payments to a bankrupt railroad’s employees from its bankruptcy estate on a one-time basis.²⁵⁹

We note, however, that Heald coauthored a subsequent article with Professor Suzanna Sherry in which they suggest that any such limitations pertaining to patent law — rather than to copyright — might be rather less stringent.²⁶⁰ They provide three justifications for this conclusion. First, they note the English tradition of granting patents of importation, which “were awarded not to inventors but to capitalists who needed a special economic incentive to set up shop in the United Kingdom.”²⁶¹ Second, they observe the practical reality that products of nature, while nominally unpatentable (because they are mere discoveries rather than inventions), are often in fact patented when isolated by

255. See Paul Heald, *The Vices of Originality*, 1991 SUP. CT. REV. 143, 170–73.

256. *Id.* at 172–73 (noting the Supreme Court’s apparent view “that the protection of works [falling short of the originality requirement] would frustrate the goals of the Intellectual Property Clause by diminishing the raw materials available for others’ creations”).

257. *Id.* at 173.

258. U.S. CONST. art. I, § 8, cl. 4.

259. 455 U.S. 457, 468–71 (1982).

260. See Heald & Sherry, *supra* note 93 (“We note that history indicates that a [limiting principle with respect to invention] may not be so strong a constraint on Congress.”).

261. *Id.* (suggesting the Framers “may not have ruled out rewarding importers of new inventions,” but noting the absence of any historical analogue to justify a more relaxed definition of “author[s]”).

human hands, such as in the case of human gene sequences.²⁶² Finally, they acknowledge the pre-AIA policy of disregarding overseas inventive activity (though not publication) in determining whether a sought patent might be granted, a rule which “favored American inventors who might not have actually been the first to conceive of . . . a particular invention.”²⁶³ Thus, while Heald and Sherry believe that the Intellectual Property Clause impliedly limits the other enumerated powers in certain respects, they seemingly embrace a broader conception of inventorship compatible with this Article’s position.

Contrary to Heald and Sherry, Professor Jeanne Fromer makes the narrower argument — more salient to our proposal — that the Intellectual Property Clause impliedly bars Congress from acting under the auspices of its other enumerated powers to achieve something akin to a patent of importation.²⁶⁴ In her view, “[t]he IP Clause’s text and placement within the constitutional structure suggest that Congress possesses power to pursue the goal of promoting the progress of science and useful arts, but only by using the means specified by the Clause itself.”²⁶⁵

In reaching this conclusion, Professor Fromer relies in part on historical evidence showing that the Framers, during the Constitutional Convention, rejected various other ways that Congress might promote progress, such as by “award[ing] grants and prizes” to spur innovation.²⁶⁶ She likewise points to Congress’s refusal in the early years of the republic to enact laws that would have permitted the federal government to encourage innovation through means other than issuing patents and copyrights.²⁶⁷ As a consequence, Professor Fromer posits that Congress cannot use another enumerated power — for example, the Commerce Clause — to “promote the IP Clause’s ends” while “subvert[ing] its means.”²⁶⁸

Professor Fromer’s theory, if correct, comes closer to precluding patents on AI-produced inventions. The crux of the matter under her theory would be whether these patents fall within the means specified by the Intellectual Property Clause. Professor Fromer views patents of importation — that is, patents granted to someone other than the creator of the claimed invention — as incompatible with the “means”

262. *Id.* at 1164–65.

263. *Id.* at 1165.

264. See generally Jeanne C. Fromer, *The Intellectual Property Clause’s External Limitations*, 61 DUKE L.J. 1329, 1331–32 (2012) (“This Article . . . show[s] that the IP Clause is set up to limit Congress from using any of its other Article I powers ‘To promote the Progress of Science and useful Arts’ through laws that would reach beyond the scope of the power conferred by the IP Clause to [issue patents and copyrights].”).

265. *Id.* at 1332.

266. *Id.*

267. *Id.*

268. *Id.* at 1333.

established by the Intellectual Property Clause.²⁶⁹ To bolster this conclusion, she points to the failure of the First Congress to adopt language proposed for the 1790 Patent Act, which would have explicitly permitted patents of importation.²⁷⁰ What’s more, because the Intellectual Property Clause under her analysis constrains Congress’s authority under other enumerated powers, patents of importation (and probably patents on AI-produced inventions) wouldn’t pass constitutional muster even under the auspices of the Commerce Clause or another enumerated power.²⁷¹

This Article concludes otherwise. As discussed earlier, the historical record surrounding the passage of the 1790 Patent Act is ambiguous at best. Some substantial number of Founders and members of the First Congress clearly *did* think patents of importation were constitutional,²⁷² in keeping with the English patent practices that they had likely drawn on in drafting the Intellectual Property Clause.²⁷³ More to the point, even Madison, the Framers who allegedly torpedoed the effort to authorize patents of importation, “expressly reject[ed] as the basis for constitutional interpretation the fact that a particular proposal had been rejected by the convention.”²⁷⁴ We submit that the historical evidence that Professor Fromer points to is simply too elusive to yield the hard rule she proposes. And, as the previous parts have shown, other analytical modalities — historical, prudential, and doctrinal — all support Congress’s authority to issue patents on AI-produced inventions.

VIII. CONCLUSION

Based on our analysis of the Intellectual Property Clause, we conclude that AI-produced inventions may be patented consistent with the scope of Congress’s authority under the Clause. To be sure, an AI system cannot be considered an inventor for purposes of the current Patent

269. *Id.* at 1354 (“James Madison and others fairly clearly believed that Congress could not rely on the IP Clause to implement any means of promoting the progress of science and useful arts beyond the means specified in the Clause. Patents of importation represented one example of such impermissible means.”).

270. *Id.* at 1353–54 (discussing the First Congress’s approach to the 1790 Patent Act).

271. *Id.* at 1354 (“But for the IP Clause, Congress would likely have . . . the authority to provide for patents of importation pursuant to the Commerce Clause.”).

272. See *supra* notes 159–70 and accompanying text (discussing Madison, Washington, and Hamilton’s viewpoints on whether the Patent Act should permit patents of importation).

273. See *supra* notes 90–100 and accompanying text (discussing the extent to which the Framers would have possessed both an awareness of and a desire to adopt English patent practices).

274. Walterscheid, *supra* note 79, at 313. As Madison explained, “without knowing the reasons for the votes in those cases, no such inference can be sustained. The propositions might be disapproved because they were in bad form or not in order; because they blended other powers with the particular power in question; or because the object had been, or would be, elsewhere provided for.” *Id.* at 313 n.99 (quoting Letter from Madison to Professor Davis, in 3 RECORDS OF THE FEDERAL CONVENTION OF 1787, at 518, 520 (Max Farrand, ed., 1937)).

Act.²⁷⁵ Nor do we believe that an AI falls within the scope of inventorship permitted by the Intellectual Property Clause, which has historically been limited only to natural persons.²⁷⁶

We do conclude, however, that various natural persons could be deemed the inventor of an AI-produced invention consistent with the limits of the Constitution. As our historical analysis of the Intellectual Property Clause indicated, inventorship at common law was not limited to the literal creator of a claimed invention.²⁷⁷ Rather, “Inventors” also encompassed individuals who first made an invention available to the public, such as the first importer of overseas technology.²⁷⁸ Thus, a natural person who plays a similar role with respect to AI-produced inventions — for example, an individual who commercializes an AI system’s useful output — could comfortably fit within the historical scope of inventorship.

A prudential analysis likewise supports a broad conceptualization of inventorship compatible with patenting AI-produced inventions.²⁷⁹ The Supreme Court has traditionally spoken of patent law in utilitarian terms, and one can easily imagine that permitting patents on AI-produced inventions would further incentivize the development of valuable AI systems. Even under a rights-based concept of patent law, the various individuals responsible for setting an AI system’s processes into motion might be thought to have some right to the AI’s productive output.

From a doctrinal perspective, the general trend in patent law has been deference to Congress.²⁸⁰ Moreover, the doctrine of simultaneous conception and reduction to practice — whereby the first individual to discover the value of an unexpected product is considered its inventor — suggests that patent doctrine is primed to accept a broader scope of inventorship. Consequently, we think Congress has wide latitude to define inventorship as it sees fit, including to accommodate AI-produced inventions which might lack, in a colloquial sense, a human creator.

Finally, despite contrary views from other scholars,²⁸¹ we cannot see that any limitations inherent in the textual structure of the Intellectual Property Clause would prohibit issuing a patent on an AI-produced invention. Thus, whether viewed from a historical, prudential, doctrinal, or textual viewpoint, the Intellectual Property Clause should be

275. *See supra* Part II.

276. *See supra* Part III.

277. *See supra* Section III.A.

278. *See supra* Section III.A.

279. *See supra* Part IV.

280. *See supra* Part V.

281. *See supra* Part VI.

understood to grant Congress the authority necessary to issue patents for AI-produced inventions.

With that said, further questions remain. Our Article addresses only whether issuing patents on AI-produced inventions would be constitutional, not whether doing so is wise or practical. Though we conclude that Congress has ample authority to issue patents on AI-produced inventions, we take no position on whom — that is, which natural person — should be the recipient of the patent on any particular AI-produced invention. Likewise, we take no position on whether issuing patents on AI-produced inventions would be wise as policy matter. This Article’s primary contribution is simply to assess the limits of what Congress *may* do with respect to AI-produced inventions. The question of what Congress *should* do is less clear. Although some scholars have begun investigating these questions,²⁸² further study and analysis will be necessary as AI systems become more common and as their impact on existing patent doctrines becomes more apparent.

282. See, e.g., Dr. Shlomit Yanisky Ravid & Xiaoqiong (Jackie) Liu, *When Artificial Intelligence Systems Produce Inventions: An Alternative Model for Patent Law at the 3A Era*, 39 CARDOZO L. REV. 2215, 2232 (2018) (discussing the range of natural-person “stakeholders with varying interests” in the inventive output of an AI system); Mark A. Lemley, *Faith-Based Intellectual Property*, 62 UCLA L. REV. 1328, 1334 (2015) (suggesting that patent protections do not always reliably promote the dissemination of new inventions).