Being Within the Useful Arts as a Further Constitutional Requirement for US Patent-Eligibility

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One of the salient differences between UK and US law is that a written Constitution places limits on legislative supremacy in the United States. The US Constitution is "the supreme law of the land", and its provisions supersede those of any treaties or statutes. Accordingly, Congress, unlike Parliament, lacks power to legislate either in fields that the Constitution specifically prohibits or outside the fields that the Constitution's catalogue of enumerated powers defines. For example, because the Constitution expressly prohibits it, Congress cannot establish a state religion or, it now appears, prohibit citizens from keeping guns within their homes, and Congress cannot enact a bill of attainder nor grant any title of nobility. In addition, because the Constitution fails to authorise it, Congress cannot provide a private civil remedy against gender-based violence. Parliament could do any of those things, however, if it chooses.

Moreover, the Constitution's specific description of an enumerated power can by implication limit Congress from legislating in a given field beyond the borders of the specific description of the power. For example, Congress has an enumerated power to enact uniform bankruptcy laws. While the Constitution does not specifically prohibit non-uniform bankruptcy laws, the enumeration of a specific power to enact uniform bankruptcy laws is understood to prohibit enactment of non-uniform ones. Thus, when Congress enacted a special, ad hoc law to protect employees of a bankrupt railroad by giving them a preference over other creditors of the railroad, the Supreme Court held the statute unconstitutional because it was a non-uniform bankruptcy law. The patent clause of the US Constitution also enumerates a specific power to legislate in a defined field and for a defined purpose. The patent clause—art.I s.8 cl.8—gives Congress the power "To promote the Progress of ... useful Arts, by securing ... to ... Inventors the exclusive Right to their ... Discoveries." Just as Congress lacks the power to enact non-uniform bankruptcy laws, it lacks the power to enact laws granting patents to non-inventors or otherwise exceed the scope of the defined power.


1 Constitution of the United States art VI cl 2 ("This Constitution . . . shall be the supreme Law of the Land . . .").
2 Reid v Covert 354 U.S. 1, 16-17 (1957):
"[N] o agreement with a foreign nation can confer power on the Congress, or on any other branch of Government, which is free from the restraints of the Constitution. . . . The prohibitions of the Constitution were designed to apply to all branches of the National Government and they cannot be nullified by the Executive or by the Executive and the Senate combined."
See also Marbury v Madison 5 U.S. (1 Cranch) 137 (1803) (because "a law repugnant to the Constitution is void"); the courts will not enforce a law that they find to be contrary to the Constitution.

3 US Constitution amend.I.
5 US Constitution art.I § 9 cl.3.
"It is often said that it would be unconstitutional for the United Kingdom Parliament to do certain things, meaning that the moral, political and other reasons against doing them are so strong that most people would regard it as highly improper if Parliament did these things. But that does not mean that it is beyond the power of Parliament to do such things. If Parliament chose to do any of them the courts would not hold the Act of Parliament invalid."

9 US Constitution art.I § 8 cl.4 (providing that Congress shall have power to "establish . . . uniform Laws on the subject of Bankruptcies throughout the United States").
10 The law was non-uniform because it applied only to one debtor, the particular railroad.
11 Railway Labor Executives' Ass'n v Gibbons 455 U.S. 457 (1982). The Court explained that Congress could not invoke the Commerce Clause to enact a non-uniform bankruptcy law because that "would erode from the Constitution a limitation on the power of Congress to enact bankruptcy laws." Railway Labor 455 U.S. 457, 468-69 (1982). By that the Court meant that such a law would subvert the Constitution's express and intentional limitation of congressional power to establishment of uniform bankruptcy laws.
12 Without elision, the clause states that Congress shall have the power: "To 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." It is generally accepted that in the 18th century, "Science" meant human know ledge in general, and "Discoveries" meant what we now term inventions. See, e.g., In re Comiskey 499 F.2d 1365, 1375 n.9 (Fed. Cir. 2007); In re Bergy 596 F.2d 952, 958 (Ct. Cust. & Pat. App. 1979) ("the word 'science' in this connection having the meaning of knowledge in general, which is one of its meanings today").
"As we have noted in the past, the Clause contains both a grant of power and certain limitations upon the exercise of that power. Congress may not create patent monopolies of unlimited duration, nor may it "authorize the issuance of patents whose effects are to remove extant knowledge from the public domain, or to restrict free access to materials already available."

(quoting Graham v John Deere Co 383 U.S. 1, 6 (1966)); ("The clause is both a grant of power and a limitation. This qualified authority, unlike the power often exercised in the 16th and 17th
This distinctive feature of US jurisprudence may shortly assume special current prominence in intellectual property law because of the pendency in the US courts of In re Bliski, a case concerning the eligibility of business methods for patent protection. The case is now pending in the intermediate court of appeals for patent cases (the US Court of Appeals for the Federal Circuit), and commentators consider it likely that the case will then go to the Supreme Court. If Congress lacks power to enact statutes providing for the grant of patents on business methods, issued business method patents are invalid and applications for business method patents must be denied. That determination would put an end to the growing controversy over the propriety of business-method patents. Until the late 1990s, it was generally accepted that new business methods were outside the scope of the patent system. But then the Federal Circuit’s landmark decision in State Street Bank & Trust Co v Signature Financial Group Inc broke precedent and held business methods patent-eligible.

Since then, business-method patents have been a source of considerable dispute and increasing concern over their patent-eligibility.

**Patent-eligibility**

A technical advance or innovation may be ineligible for a patent simply because the statute omits it from the legislative catalogue. Section 101 of the US patent code authorizes issuance of a patent on any new and useful invention that is a “process, machine, manufacture, or composition of matter.” Inventions that do not fall into one of these categories cannot be patented under present law, although Congress could amend §101 to cover such inventions if it chose to do so.

An innovation may be patent-ineligible because it is not the kind of thing that the statute was enacted to protect, even though it purports to be claimed in terms of one of the statutory categories. Mathematical principles, for example, are held unpatentable even if claimed in “process” language. Thus, a process for determining the hypotenuse of a right triangle, comprising summing the squares of the sides adjacent to the right angle and calculating the square root of the sum, is not patent-eligible. The same principle denies patent-eligibility to laws of nature, natural phenomena, and abstract ideas.

The rule against patent-eligibility of such things is one of public policy—even limited monopolies on fundamental principles is more likely to hinder than promote technological progress. A recent Supreme Court minority opinion explained the concept:

> Sometimes [patents] can discourage research by impeding the free exchange of information ... and by raising the costs of using the patented information, sometimes prohibitively so... Thus, the Court has recognized that phenomena of nature, though just discovered, mental processes, and abstract intellectual concepts are the basic tools of scientific and technological work. It has treated fundamental scientific principles as part of the storehouse of knowledge and manifestations of laws of nature as free to all men and reserved exclusively to none. And its doing so reflects a basic judgment that protection in such cases, despite its potentially positive incentive effects, would too often severely interfere with, or discourage, development and the further spread of useful knowledge itself.

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21 United States Code 35 USC § 101. This language remains substantially unchanged from the first US patent law in 1790.

22 See In re Nautilus, 500 F.3d 1346 (Fed. Cir. 2007) (incorporal signal is not article of manufacture); see also American Fruit Growers Inc v Bredex Co 283 U.S. 1 (1931) (orange whose rind is impregnated with borax is not article of manufacture). An invention that fails to qualify under one category of the statute may nonetheless qualify under a different one. Thus, in the Bredex case the invention could not be patented as an article of manufacture but the process of preserving an orange from decay by impregnating its rind with borax, if novel, qualified as a patentable process.

23 Diamond v Diehr, 455 U.S. 175, 185 (1981):

> This Court has undoubtedly recognized limits to § 101 and every discovery is not embraced within the statutory terms. Excluded from such patent protection are laws of nature, natural phenomena, and abstract ideas; Parker v Flook, 437 U.S. 584, 589 (1978): "Phenomena of nature, though just discovered, mental processes, and abstract intellectual concepts are not patentable, as they are the basic tools of scientific and technological work." (quoting Gottschalk v Benson, 409 U.S. 63, 67 (1972) (holding an algorithm, as such, patent-ineligible because it is an abstract idea)). See also Diamond v Chakrabarty, 447 U.S. 303, 309 (1980): "[A] new mineral discovered in the earth or a new plant found in the wild is not patentable subject matter. Likewise, Einstein could not patent his celebrated law that E = mc²; nor could Newton have patented the law of gravity."

The policy is ultimately derived from the Constitution's purpose of promoting the progress of knowledge and technology by enacting intellectual property laws. The case law, however, usually phrases the issue in terms of statutory construction—the categories of s.101 of the US patent law are interpreted in the light of the Constitution. Thus, even though something may be claimed as a "process", as in the previous hypothetical-determination example, the case law "forecloses a purely literal reading of section 101". The words of the statute must be interpreted (if possible) to avoid a construction that makes the statute unconstitutional. Thus, the Supreme Court has said:

"The rule that the discovery of a law of nature cannot be patented rests, not on the notion that natural phenomena are not processes but rather on the more fundamental understanding that they are not the kind of 'discoveries' that the statute was enacted to protect."  

Because the language of s.101 cannot be read literally, a considerable body of case law—not entirely consistent or harmonious—has explored the proper meaning of "process" and the other words of s.101 enumerating the categories of patent-eligible subject matter. Several principles have emerged. First, a process is patent-eligible if it transforms one substance into another substance, thereby substantially altering material physical properties of the substance, as in tanning, ore-smelting, or rubber-vulcanization. Such a process is patent-eligible, even if the process is implemented with no specific device at all. This test is usually not helpful in business-method cases, for they typically do not involve transformation of substances.

A second, and more widely explored, legal test of patent-eligibility addresses the underlying principle or principles that the claimed advance embodies. Claimed processes typically implement some underlying scientific principle, phenomenon of nature, or abstract idea ("underlying principle") by using a device. The implementing device may be a machine, article of manufacture, or other product. Although the principle, of itself, is not patent-eligible, the process or implementing device may be patent-eligible. The clue to patent-eligibility is whether the device differs from the prior art, i.e. what was already known—in a way that is not concededly, or on its face, trivial. The process at issue in the Flook case failed this test because its implementation was concededly trivial. The composition or article of manufacture at issue in Funk Brothers Seed Co v Kalo Inoculant Co failed this test because the implementation was facially trivial once one was in possession of the underlying natural phenomenon. In contrast, the process at issue in the Diehr case survived this test because, at least on the record before the Court, the implementation was neither concededly nor facially trivial.

If an innovation fails to qualify under the substance-transformation test or device-implementation test, it is presumptively patent-ineligible. Thus, the Benson Court said:

"We do not hold that no process patent could ever qualify if it did not meet the requirements of our prior precedents [on substance-transformation and device-implementation]."

That statement suggests that it would be better to adopt a rebuttable presumption than an absolute rule that such processes are never patent-eligible. It remains uncertain that our past experience of the correctness of the proposition—that device-implementation and substance-transformation are the sole clues to patent-eligibility of processes—will project indefinitely into the future. Accordingly, a principle of prima facie or presumptive patent-ineligibility is preferable to an absolute ineligibility rule and is supported by case law.
The federal patent power and its limits

As mentioned earlier, the US copyright and patent laws stem from the Constitution’s grant of power to Congress, in art.I s.8 cl.8, to promote the progress of human knowledge by securing to inventors exclusive rights in their writings and to promote the progress of “useful Arts” by securing to inventors exclusive rights in their inventions (“discoveries”). The Supreme Court has held on several occasions that this grant of power (like that to enact uniform bankruptcy laws) is a limitation as well as a positive grant. In *The Trademark Cases*, the Court held that art.I s.8 cl.8 did not authorize Congress to pass legislation protecting trade marks, because they are neither writings nor inventions; accordingly, the original trade mark law was held unconstitutional as beyond congressional power. In *Feist Publications Inc v Rural Tel. Serv. Co*, the Court held that copyright protection could not be extended to things that were not original works of authorship—such as a rote tabulation of names, addresses and telephone numbers. In effect, this established a minimum creativity level for eligibility of writings to gain copyright protection.

Most importantly, for present purposes, in *Graham v John Deere Co* the Supreme Court held that the Constitution established a minimum creativity level for patent-eligibility. As a result, the meaning of the patent statute’s “inventive step” or “obviousness” requirement was prescribed in the Constitution’s limitation of patent protection to inventions of inventors—not those slight technological advances that resulted from merely routine artisanship. The Court explained:

“At the outset it must be remembered that the federal patent power stems from a specific constitutional provision which authorizes the Congress 'To promote the Progress of...useful Arts, by securing for limited Times to...Inventors the exclusive Right to their...Discoveries.' Art. I, § 8, cl. 8. The clause is both a grant of power and a limitation. This qualified authority, unlike the power often exercised in the sixteenth and seventeenth centuries by the English Crown, is limited to the promotion of advances in the 'useful arts'. It was written against the backdrop of the practices—eventually curtailed by the Statute of Monopolies—of the Crown in granting monopolies to court favorites in goods or businesses which had long before been enjoyed by the public. The Congress in the exercise of the patent power may not overreach the restraints imposed by the stated constitutional purpose. This is the standard expressed in the Constitution and it may not be ignored.”

The Court then went on to hold that the word “obvious”, used in s.103 of the patent statute to state the requirement that patents may issue only to technological advances that were not obvious to a person of ordinary skill in the art at the time of the invention, must be interpreted with “reference to a standard written into the Constitution”.

Consideration of the *Graham* opinion suggests that the “standard expressed in the Constitution” has several different elements or dimensions. These include level of technical merit, human inventorship, absence of conflict with the “monopoly backdrop” and the promotion of progress in useful arts.

Technical merit

Most immediately, for purposes of the *Graham* case, the constitutional standard includes a minimum level of technical merit below which patent protection was not to be permitted. It is unclear whether such a standard permits petty patents or utility models for innovations of only slight merit. Certainly, they cannot be granted under the patent clause. The unresolved question is whether they can instead be granted under the congressional power to regulate commerce, as trade marks have been granted, in the wake of the decision in *The Trademark Cases*. The decision striking down a non-uniform bankruptcy law as unconstitutional points in the opposite direction. The seeming difference is that a trade mark law under the commerce clause does not subvert the purposes of the patent clause but a petty patent law might do so, as the non-uniform bankruptcy law did in regard to the purposes of the uniformity requirement of the bankruptcy clause. Subsequent Supreme Court decisions confirm the rule that the patent clause establishes a minimum level of technical advance for patent protection. In *KSR Int’l Co v Telesfix Inc*, the Court again considered the meaning of the non-obviousness requirement of the patent law, indicating again that the Constitution set a minimum creativity level:

“[T]he results of ordinary innovation are not the subject of exclusive rights under the patent laws. Were it otherwise patents might stifle, rather than promote, the progress of useful arts. See U.S. Const., Art. I, § 8, cl. 8. These
premises led to the bar on patents claiming obvious subject matter."\(^4^7\)

Inventors

Another element of the standard written into the Constitution is that patents may be granted only to inventors, who are individual human beings. If it could be shown that a computer, rather than a human being, invented a given technical advance, presumably any patent granted on the advance—on the computer’s work—would be invalid.

Monopoly backdrop

The _Graham_ decision’s references to the monopoly backdrop of the patent clause and to the Statute of Monopolies make it clear that Congress cannot authorize patents to be granted on things already in the possession of the public or simply as rewards for services rendered to the state. A patent must be granted only for a contribution that will “add to the sum of useful knowledge”.\(^4^8\) As the _Graham_ Court explained:

> “Congress may not authorize the issuance of patents whose effects are to remove existing knowledge from the public domain, or to restrict free access to materials already available.”\(^4^9\)

Memory of the Boston Tea Party, less than two decades earlier than the framing of the Constitution and its patent clause, instructs us that the drafters of the patent clause wanted there to be no patents comparable to Parliament’s grant of exclusive rights to the East India Company to trade with the American colonies or to the odious monopolies of the Elizabethan and Jacobean periods. The monopoly backdrop thus illuminates for us the purpose of the framers in adopting the patent clause.

Promoting progress

By the same token, patent grants on things already in the possession of the public could not promote the “Progress of useful Arts”. Moreover, other kinds of patents, such as ones on mathematics or laws of nature, arguably might more hinder than promote progress—or, in the words of the _KSR_ decision, “stifle” such progress.\(^5^0\) While it is up to Congress to decide what will or will not promote technological progress,\(^5^1\) its discretion cannot be unlimited. There must be at least some minimum rational nexus between the means that Congress chooses to promote such progress and the accomplishment of that purpose,\(^5^2\) for Congress “may not overlook the restraints imposed by the stated constitutional purpose”\(^5^3\).

The “useful arts” limitation

Finally, just as the Constitution dictates the interpretation of “obvious” in s.103—“limiting it so that patents are not granted on “ordinary innovation””,\(^5^4\) so too the Constitution dictates the interpretation of “process”, “machine” and similar words in s.101—limiting them to things within the “useful Arts.” At the very least, it may be presumed—absent a persuasive showing to the contrary—that one cannot promote the progress of “useful Arts” by rewarding or regulating activities not within the “useful Arts.” Accordingly, Congress may no more authorize patents on things outside the “useful Arts” than it can enact non-uniform bankruptcy laws\(^5^5\) or protect non-discoveries and non-writings under the patent-copyright clause.\(^5^6\) Thus, a patent on a process for making or doing something not within the “useful Arts” exceeds Congress’s power. Quotation marks are repeatedly placed around “useful Arts” here because that term is not self-defining, and what it means is the crux of a problem with which the rest of this article wrestles.\(^5^7\)

It is possible for a claim to a process (or device) to satisfy all of the customary requirements of patentability—for example, full description of the supposed invention, detailed enablement with implementing devices, definiteness of claim language, novelty, and absence of obviousness—and yet be patent-ineligible because the subject matter is outside the useful Arts.

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47 _KSR_ 127 S. Ct. 1727 (2007) at 1746. See also _Bonito Boots_ 489 U.S. 141 (1989) (holding state utility model law on boat hull designs void—federal patent law reflects an “understanding, implicit in the Patent Clause itself, that free exploitation of ideas will be the rule” except for technological advances that merit patents, and state law that purports to set a different balance is void because it “conflicts with the ‘strong federal policy favoring free competition in ideas which do not merit patent protection’”) (quoting _Lear v Adkins_ 395 U.S. 653, 656 (1969)). _Bonito Boots_ and two earlier cases, _Sears, Roebuck & Co v Stiegel Co_ 376 U.S. 225, 230 (1964), and _Compo Corp v Day-Brite Lighting Inc_ 376 U.S. 234 (1964), established the further principle that not only does the Constitution keep Congress from granting patents on advances of only slight merit, but the Supremacy Clause of the Constitution (see Constitution of the United States art.VI cl.2 (“This Constitution ... shall be the supreme Law of the Land. ...”)), keeps states from granting patent-like protection on advances of slight or great merit.\(^4^8\) _Graham_ 383 U.S. 1 (1966) at 6.\(^4^9\) _Graham_ 383 U.S. 1 (1966) at 6.

50 See _KSR_ 127 S. Ct. at 1746. _KSR_ points out that patents may issue only for those innovations that promote “the progress of useful arts”.

51 _Graham_ 383 U.S. 1 (1966) at 6:
> “Within the limits of the constitutional grant, the Congress may, of course, implement the stated purpose of the Framers by selecting the policy which in its judgment best effectuates the constitutional aim.”


56 _Funk Brothers Seed Co v Kalo Inoculant Co_ 333 U.S. 127 (1948). There were also process claims in that case, which the Supreme Court did not address.

57 The literature has given very little attention to the useful-arts limitation on patent-eligibility. The most notable exception is Malli Pollack, “The Multiple Unconstitutionality of Business Method Patents: Common Sense, Congressional Choice, and Constitutional History” (2002) 28 _Rutgers Computer & Tech. L.J._ 61. The Supreme Court has never addressed the meaning of “useful Arts”, although over 100 of its opinions mention the phrase. But cf. _The Telephone Cases_ 126 U.S. 1 (1888) at 533 (“[I]t is only useful arts—arts which may be used to advantage—that can be made the subject of a patent.”).
Moreover, a process may be tied to a machine; the process may be more than merely a facially trivial or concededly old implementation of a scientific principle, natural phenomenon, or abstract idea; and the process may even cause a substance-transformation. The result of the process may be tangible and useful. Yet, the claimed subject matter will still be patent-ineligible if it is not within the useful arts. Some examples from literature will illustrate intuitively the point that being within the useful Arts is a *sine qua non* of patent-eligibility.

**The Kafka machine**

Consider the machine of Franz Kafka’s *In the Penal Colony*. It is a machine that cuts into the skin of culprits words appropriate to the crimes they committed, and its process continues until the culprits expire from loss of blood. The claimed subject matter of the machine is (my interpretation and claim drafting here, not Kafka’s):

A machine, said machine adapted to hold a person immobile, said machine comprising:

- a programming unit, said unit adapted to be programmed with instructions corresponding to preselected words, said unit adapted to transmit signals representative of said instructions; and
- a writing module, said module coupled to said programming unit and adapted to receive said signals therefrom, said module comprising a needle adapted to contact, penetrate, and traverse the skin of the person, said module capable of causing said needle to inscribe said preselected words on the skin of the person, responsively to said signals from said programming unit.

A process for administering to a culprit a punishment appropriate to a crime that the culprit committed, said process comprising:

1. strapping the culprit into a machine (repeat substance of above machine claim);
2. programming said programming unit with a name or a verbal description of the crime;
3. initiating operation of said writing module; and
4. continuing said operation of said writing module until the culprit expires.

Such a machine, whose function is “to make the punishment fit the crime”; is not within the useful Arts, and the process version of the machine claim, tied to the machine and claimed as a process for imposing a punishment that fits the crime, would equally be outside the useful Arts. The machine and process meet the usual non-constitutional tests of patent-eligibility; but the function of the machine and process—making punishment fit crime—is outside the useful Arts, and promoting accomplishment of that function does not promote progress of useful Arts. The utility of the machine and process are not within the useful Arts.

**Ovidian, Casanovaian and Youngmanian processes**

Consider next Ovid’s poem *Ars amatoria* or Casanova’s *Memoirs*, from either of which can be derived processes for seduction of young women, comprising such-and-such steps. Those processes may be deemed useful, concrete, tangible, valuable and other things that might seem to make them patent-eligible, but the processes are unquestionably not within the useful Arts as that term is used in art.I § 8 cl.8.

Similarly, claims to processes for making people laugh that comprise telling them anecdotes beginning, “Take my wife, please”, must be patent-ineligible. So, too, are claims to slapstick-comedy routines.

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58 These patent-eligibility requirements derive from a Supreme Court trilogy of opinions in the last third of the 20th century, since which the Supreme Court has not addressed patent-eligibility. They are: *Benson* (1972) 409 U.S. 63; *Flook* (1978) 437 U.S. 584; and *Diamond v. Diehr* 450 U.S. 175 (1981). See fn.23-33 and accompanying text.

59 The *State Street* case is said to support the proposition that a machine or process is patent-eligible if it produces a “useful, concrete, and tangible result” *State Street* 149 F.3d 1368 (1998) at 1373.

60 Ovid suggests that he will teach the reader such processes and terms himself the “professor of love” (*ego sum praeceptor amoris*). See, e.g. *Ars amatoria*, Book I (opening lines).

61 Henny Youngman is usually credited as the inventor of this expedient. For more information, see, e.g., [http://en.wikipedia.org/wiki/Henny_Youngman](http://en.wikipedia.org/wiki/Henny_Youngman) [Accessed November 5, 2008].

62 Slapstick-comedy routines ordinarily have specific device limitations, such as a paddle or cream pie, while the take-my-wife-please routine can be revised to add a nominal apparatus limitation, if that makes any difference, by designating the process one for making a large room of people laugh and by adding a microphone and sound system. Users of such processes
It is manifest, therefore, that the legal tests that have heretofore figured in patent-eligibility litigation, including even those derived from the Supreme Court's patent-eligibility trilogy—Benson, Flook and Diehr—are incomplete and incapable of addressing some processes (and devices) that we "know it when [we] see it" are patent-ineligible. A further test based on the constitutional requirements for patent-eligibility must be added.

Determined what are the useful Arts

Accordingly, the courts must find a way to determine whether given human activities are within the useful Arts. The usual approach of consulting legal precedents will not help, because there are few or none on what are and what are not useful Arts.

One legal approach that some analysts have favoured is to look to the policies that are furthered or hindered by one or another interpretation of the statutory or constitutional words—here, "useful arts". The analyst then compares the respective regimes that follow from one or another interpretation choice, and fastens on the choice that leads to a regime that the analyst prefers. This is likely to be a highly subjective and ultimately unsatisfying project, however, requiring agreement on a hierarchy of values for weighting pros and cons: such an agreement is not easy to come by. Are we better off with a regime that channels entrepreneurial and engineering talent into the creation of patented devices for exercising cats? Or the creation of something completely different? In the Bilski case, amicus curiae briefs of different representatives of the financial services industry came up with diametrically opposite conclusions as to whether society would be more benefited by allowing or disallowing patents on financial and business-method software. This approach does not promise a solution to this problem.

Alternatively, we might look to the purpose of the clause. Clearly, a major purpose is to promote the progress of "useful Arts". But we already knew that. Aside from the words of the text, about the only thing we know of the purpose of the clause is given by the "monopoly backdrop". We will return to that, but for the moment all we can derive from this aspect of the purpose of the clause is negative: re-establishing the East India Company's trading monopoly and re-instituting the odious monopolies that led to the Statute

are financially well-rewarded for performing them, making the processes economically valuable (a supposed badge of patent-eligibility).

64 The language is that of Stewart J. in Jacobellis v Ohio 378 U.S. 184 (1964) at 197. The criterion of knowing it when one sees it should be considered not so much a positive legal test as an intuitive reality-check.

Textualism

The analytic approach that it is proposed to explore here is known as textualism. A textual analysis relies on the ordinary meaning of the relevant passage, as it would have been understood at the time that the legal instrument—such as a statute or constitutional clause—was created. In this case, that would mean what were considered "useful Arts" in the 18th century. Wikipedia describes textualism as follows:

"Textualism is a formalist theory of statutory interpretation which holds that a statute's ordinary meaning should govern its interpretation, as opposed to inquiries into non-textual sources such as the intention of the legislature in passing the law, the problem it was intended to remedy, or substantive questions of the justice and rectitude of the law." [Accessed November 5, 2008].

Hugo Black and Antonin Scalia JJ. have been termed advocates of textualism. Textualism is not exactly the same as "plain meaning", for the sense of a term in a text may vary in different contexts and therefore vary from text to text. Scalia J. pointed out, in a 1988 opinion which attempted to interpret a law that excluded articles of foreign manufacture from the United States, that recourse to dictionaries in order to find the "plain meaning" may often not help, because dictionaries cannot identify for users the particular context at issue in the text in question. "Foreign manufacture" could mean made by a foreigner (as the majority thought) or made in a foreign country by anyone (as Scalia thought), and "foreign" means still something else when you refer to having a foreign object in your eye. Which dictionary meaning should apply?

Unitary concept

In the present case, there is a further reason why dictionaries do not help. The principal dictionaries used in and around the 18th century do not address what

are the useful Arts.\textsuperscript{68} Even worse, it does no good to look up “useful” and then look up “arts”, in order to combine the two definitions. Like the fine arts and the liberal arts, or “due process”, the “useful Arts” is one of those terms whose meaning is not the sum of its constituents. It is a unitary concept—usefullarts—with its own, independent meaning. A useful art is more than an art that is useful, although that is a clue. However, merely being useful does not put an art within the useful Arts. The “Take my wife, please” comedy routine is useful (for example, as a way to earn a living) but it is not within the useful Arts, and the same thought applies to other previous examples such as Casanovian methods. The useful Arts constitute a subset of those arts that are useful.

“Take my process instead, please?”

Another dead end should be eliminated at the outset. It might be thought that it would be sufficient to figure out what “process” means, for that is the specific problem of the Bilski case. Bilski claimed a process. Maybe it’s enough to find out what process meant in 1789, and never mind the rest of the useful Arts, such as ploughs, shovels, and flour mills. But that won’t work, even if we seek to put off for another day improvements in manufactured products such as superior ploughs.

First, the exercise is futile because the Supreme Court has already held, in Flook, that the meaning of “process” for purposes of § 101 of the patent law is not the ordinary or literal meaning of the word.\textsuperscript{69}

Rather, it is a term of art.

Secondly, even if the process is the kind of process that passes muster in the term-of-art sense—that is, it satisfies the regular Benson-Flook-Diehr tests of device-implementation and the like—it can still fail, as does the process of operating the Kafka machine, for example. The process still needs to be one within the useful Arts to be patent-eligible. We therefore still must ascertain what the useful Arts are. The question is unanswerable. We must turn to the US Constitution and seek to ascertain what its term “useful Arts” meant in and around 1789.\textsuperscript{70}

Determining what were useful Arts around the time of adoption of the US Constitution

Literary sources, however, may be of some value. We can look to books and other writings of the 18th century. George Washington, for example, explicitly distinguished commerce from useful Arts.\textsuperscript{71} A 1798 letter to Lafayette, Washington differentiated commerce from useful Arts by stating:

> “While our commerce has been considerably curtailed for want of that extensive credit formerly given in Europe, and for default of remittance; the useful arts have been almost imperceptibly pushed to a considerable degree of perfection.”\textsuperscript{72}

This is an important distinction, because trade, commerce and business were regarded as quite separate from the useful Arts in the 18th century. If sufficiently well supported, this usage may be dispositive for business-method patents, although not necessarily for other “peculiar” patents of the kind that have recently being springing up (such as methods for exercising a cat).

Colonial and early patents

It is even more useful to consider the kinds of patents that issued in the period near and preceding the adoption of the US Constitution. It is preemptively reasonable to assume that these patents exemplify what were regarded as useful Arts at the time of the Constitution. The first two patents that issued under the first federal patent statute were on manufacturing processes—potash-making and candle-making.\textsuperscript{73} Earlier colonial patents were for similar processes. In 1641 and 1656, the Massachusetts Bay Colony granted patents on new methods of making salt, and in 1646 on machinery for making scythes and other edged tools. In 1716, South Carolina granted a patent on a tar-oil derivative that prevented wood from rotting. In 1728, Connecticut granted a patent on a process for making steel from iron. In 1732, 1735, and 1756, South Carolina granted patents on rice-cleaning machines. In 1780, New York and Pennsylvania granted patents on an oil for currying horses. Maryland issued a patent on a steam-propelled

\textsuperscript{68} Neither Samuel Johnson nor Noah Webster, the principal lexicographers of the period, defined “useful arts” in their dictionaries. Noah Webster, An American Dictionary of the English Language, (1st edn 1828, reprint 6th edn (1899)) does not define “useful arts” but he does state, under art: “Arts are divided into useful or mechanic, and liberal or polite. The mechanic arts are those in which the hands and body are more concerned than the mind; as in making clothes and utensils. These arts are called trades. The liberal or polite arts are those in which the mind or imagination is chiefly concerned; as poetry, music and painting.”

\textsuperscript{69} Flook (1978) 437 U.S. 584 at 588–89.

> “The plain language of § 101 does not answer the question. It is true, as [the] respondent argues, that his method is a ‘process’ in the ordinary sense of the word. But that was also true of the algorithm, which described a method for converting binary-coded decimal numerals into pure binary numerals, that was involved in Gottschalk v. Benson. The holding that the discovery of that method could not be patented as a ‘process’ forecloses a purely literal reading of § 101.”

\textsuperscript{70} This is the approach that the Supreme Court’s decision in Markman v Westview Instruments Inc 517 U.S. 370 (1996) at 376–82, suggests for deciding whether judges or juries should interpret the words of patent claims: you should look to practice in and preceding the 18th century.

\textsuperscript{71} Fitzpatrick (ed.), The Writings of George Washington from the Original Manuscript Sources, 1722–1799 (Letter of January 29, 1798). Several other literary sources are collected in the Patent and Trademarks Office (PTO) Supplemental Brief in Bilski at 11 fn. 4 (suggesting that useful arts all are manufacturing processes). \textsuperscript{72} Other 18th century sources equate the useful arts to manufacturing techniques. See, e.g. Tench Coxe, “An Address to an Assembly of the Friends of American Manufactures” in Calling for More Domestic Manufacturing (1787), p.17 (equating “useful arts” to “manufactures”); (p.18) (describing progress in the useful arts as having produced improvements in numerous kinds of manufactures); George Logan M.D., A Letter to the Citizens of Pennsylvania, on the Necessity of Promoting Agriculture, Manufactures, and the Useful Arts (1800), pp.12–13 (equating “useful arts” to manufacturing processes).

\textsuperscript{73} The first US patent, granted to Samuel Hopkins (No.X1, issued July 31, 1790), was on a method of making potash. The next patent (No.X2, August 6, 1790) issued to Joseph Sampson on a method of making candles. The only other patent (No.X3, December 18, 1790) issued to Oliver Evans for flour-milling machinery.
horseless carriage in 1787. Pennsylvania granted a patent on improvements in steam engines in 1789. 74 These early patents indicate the kinds of things on which patents were considered appropriate in the 18th century. By the same token, we can recognise the absence from this list of some other categories of human endeavour. These include dancing, fencing, flower arrangement, portrait painting, rhetoric, music composition, musical performance, composition of drama and poetry, and geometry. At least some of these are arts, but they are not useful Arts and they do not appear to have been the subject of patents.

We can also recognise the absence of business methods from the list. Is that merely an indicator of the lack of innovativeness in methods of doing business? Are new business methods a creature only of the recent past? If so, might the absence of colonial patents on business methods reflect only the absence of new business devices? There is no reason to believe that the proverbial sharp Yankee was any less innovative than today’s Wall Street masters of the universe. People have always thought up new business methods. Italian bankers in the Middle Ages invented bills of exchange. Thales of Miletus (circa 600 BC) thought up a method of enriching a philosopher by cornering the market in olive presses. 75 It is implausible that the 18th century represented an intellectual desert for innovativeness in business methods. It is more plausible to infer that the lack of colonial business-method patents reflects a belief in their patent-inelegibility.

The monopoly backdrop

It is useful, too, to consider what the Graham decision terms the "the backdrop of the practices" that led to the passage of the Statute of Monopolies and ultimately to the patent clause of the US Constitution and its built-in restraints on congressional power, 76 when trying to determine what the framers of the clause sought to include and exclude from patent protection. Some features of the patent system—such as the limitation of patents to new forms of manufacture in which the public had not previously engaged—specifically reflect hostility to Crown-granted monopolies to those persons whom the Crown favoured.

Two examples illustrate the point. One is the East India Company’s tea monopoly, which had led to the 1773 Boston Tea Party a few years before the 1789 adoption of the Constitution. The East India Company did not invent or discover an improved way to process tea, for which it was awarded a patent monopoly. The Crown simply favoured the Company with a royal grant of a monopoly over trade with the American Colonies, which gave it a franchise to put the colonists by extracting monopoly rent from them, to enrich the Company’s shareholders. The monopoly in tea trade stands at the opposite pole from what the patent clause of the US Constitution seeks to establish. 77

A second example is the Case of the Playing Card Monopoly, 78 nearly two centuries before the adoption of the US patent clause. The Crown gave a monopoly on the sale of playing cards, which ended up in the hands of Darcy, a royal favourite. Darcy did not receive a patent for having invented an improved way to manufacture playing cards; his patent conferred the exclusive right to sell playing cards, simply as a royal favour from the Queen, 79 again a franchise to mulct the public by extracting monopoly rent from it. 80

The controversy over Darcy’s monopoly lead to the passage by Parliament of the Statute of Monopolies, one provision of which permits patents for new manufactures but prohibits other patent monopoly grants—which were called the "odious monopolies". The Statute of Monopolies is considered an ancestor of our own patent and antitrust systems. The playing card patent monopoly also stands at the opposite pole from what the patent clause seeks to promote.

Neither engaging in trade with the Colonies nor the right to sell playing cards is a useful Art. Both are paradigmatic examples of things which are not useful Arts—things that the framers intended to exclude from the operation of any patent system granting exclusionary rights. Just as the catalogue of artisanal arts informs us what are useful Arts, the catalogue of odious monopolies helps inform us what are not useful Arts. 81 Legal history thus informs courts of practices that should be considered outside the useful Arts. Both examples, while not business methods as such, are in the same general field—trade and business, and the apparent intent of the

that sparked the Revolution, and Jefferson certainly did not favor an equivalent form of monopoly under the new government. His abhorrence of monopoly extended initially to patents as well. 78

79 See In re Comiskey 499 F.3d 1365 (Fed. Cir. 2007) at 1374–75:
80 "[T]he English Crown granted monopolies over entire types of business to specific individuals, for example the grant to James I to Darcy in 1600 of the exclusive right to manufacture or sell playing cards or the exclusive right to the printing business held by the London guild of booksellers and printers. The purpose of such monopolies was to enrich the King . . . as well as the grantee, at the expense of the community. With this background in mind, the framers consciously acted to bar Congress from granting letters patent in particular types of business. The Constitution explicitly limited patentability to the national purpose of advancing the useful arts—the process today called technological innovation." (Internal quotations and citations omitted).
81 An extensive list of "odious monopolies" is found in David Hume, History of England, Ch. 44.
82 She granted her servants and courtiers patents for monopolies; and these patents they sold to others, who were thereby enabled to raise commodities to what price they pleased, and who put invincible restraints upon all commerce, industry, and emulation in the arts. It is astonishing to consider the number and importance of those commodities, which were thus assigned over to paternity.
83 Another part of the Graham "backdrop" is the set of practices that common-law courts regarded as having pernicious effects similar to those of monopolies and therefore similarly abhorred and condemned. For example, engaging—in preempting the sale of goods or securing a monopoly of their sale. See Standard Oil Co v United States 221 U.S. 1 (1911) at 53–54. The Boston Tea Party, which Graham singles out, was a Yankee response to engaging. See Standard Oil 221 U.S. 1 (1911).
drafters of the patent clause to exclude these examples from the patent system lends further support to the inference, based on 18th century linguistic usage, that trade and business are outside the useful Arts.

A general theory of useful Arts?

Clearly, it would be preferable to articulate a general principle of what are useful Arts than solely to extrapolate from an enumeration of specific examples. But efforts to generalise have as yet been unsuccessful. An effort of this kind was based, for example, on a proposed equation of the useful Arts to the "technological arts", but it floundered. Although the technological-arts test for patent-eligibility has great intuitive appeal, it also has severe difficulties. First, the US Constitution and the patent statute do not explicitly mention "technology" or "technological arts". Accordingly, it is difficult to frame a plausible, principled argument for imposing this requirement on patent-eligibility.

Further, equating useful Arts to technological arts simply pushes the search for a satisfactory legal definition to the next level, where it continues to resist definition. What are technological arts? For example, is making potash by boiling wood-ash in water a technological art? Is candle-making? Shoemaking? Tanning? Are all of the things that we know were considered useful Arts in and before 1789 in the technological arts? That is possible but doubtful. Yet, surely it would be impermissible to interpret constitutional language to exclude things that we know were included within the concept in 1789, which militates against equating useful to technological arts.

Finally, the technological arts are only a subset of the useful Arts. If one accepts that technology is the application of the physical sciences (e.g. physics, chemistry) to the useful Arts, the resulting technological arts are only those useful Arts derived from scientific knowledge. But some useful Arts are purely empirical and non-theoretical. (Shoemaking and tanning, for example, date from long before the birth of science.)

As yet, Congress has not chosen to narrow the patent-eligible useful Arts to only those that are technological— at least in the sense used here.

Similar difficulties attend equating useful Arts to industrial arts. Neither the technological arts nor the industrial arts provides the clue to defining the useful Arts. That throws us back to defining useful Arts by enumeration (affirmative and negative) and extrapolation, based on 18th century usage.

Can a general organising principle be articulated at this time for distinguishing between useful Arts and all other arts and things, other than to say that useful Arts are what practical artisans do? That is doubtful. It may well be possible only to make two lists—a catalogue of arts (artisanal arts) clearly recognised as useful Arts and one of arts and other human endeavours clearly recognisable as not within the useful Arts, at the time of the adoption of the US Constitution. It does seem clear, however, that buying, selling, and otherwise engaging in trade or business were not considered part of the useful Arts. Otherwise, a general principle eludes us.

Extrapolation

A coherent, principled argument can be made for interpreting the useful Arts limitation of the patent clause on patent-eligibility in terms of what was understood to be, and what was understood not to be, within the useful Arts in and around the time of the adoption of the US Constitution. A reasonable question to pose in considering this proposal, however, is whether using the principle can successfully sweep up advances in useful Arts as they occur and thus promote progress of useful Arts. Surely, the framers did not intend to freeze promotion of the progress of the useful Arts by excluding new categories of artisanal inventions. It must be recognised, therefore, that some evolution of the catalogue of useful Arts must be permitted.

However, to avoid subversion of the constitutional purpose, some guiding principle must limit the expansion. Guidance may be found in the process by which technology and the useful arts operate: they build accretionally on earlier developments. Proceeding incrementally through intermediate arts, including only artisanal advances akin to and of the same general kind as already-included arts, may successfully encourage growth in the concept of useful Arts without avulsive change that undermines the policy of the patent clause. This leads to the ultimate conclusion of this article: that the useful arts to which the US patent system is limited are those arts considered "useful Arts" around the time that the US Constitution was adopted and those further developments from such arts that can be recognised as akin to them and the products of incremental development from them.

Possible examples may provide appropriate thought experiments. For example, consider integrated circuits. They were not among the useful Arts known in the 18th century, and yet they would seem to be the kind of thing to which the patent system should now extend. Integrated circuits are akin to ( ejusdem generis with) the ceramic and silica-product arts known in 1789, such as glass-making and porcelain-making. Therefore, integrated circuits could appropriately be brought within the useful Arts as an extrapolation

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82 See In re Toma 575 F.2d 872 (CCPA 1978); In re Maugrae 431 F.2d 882 (CCPA 1970) at 893.

83 See Ex Parte Lundgren 76 USPQ2d 1385 (Bd Pat Apps & Ints 2005) at 1388 (precedential): "Our determination is that there is currently no judicially recognized separate 'technological arts' test to determine patent eligible subject matter under § 101. We decline to create one."

84 In principle, however, a new statute could impose a technology requirement.


86 A partial list follows of arts clearly recognised as within the useful Arts in and around 1789: brick-making, manufacture of ceramics and silica-based products (including glass, porcelain, pottery, tiles), milling, shoemaking, smelting of metals, tanning, the arts of many kinds of smith (e.g. blacksmith, goldsmith, silversmith, tinsmith), many textile-related arts (e.g. cloth-making, dyeing, fulling). See, e.g. Jacob Bigelow, Elements of Technology (1831) (lectures on application of science to the useful Arts).
from those conventional arts. Consider automobiles. The manufacture of automobiles is an outgrowth or development of, and akin to, the wagon-making art. That marks another successful use of the proposed accretional method.

Other examples may be more complicated and problematic. The manufacture of electric light bulbs is functionally akin to candle-making, allied perhaps with glass-making; both of which were 18th century useful Arts. On that basis one might say that light bulbs, although unknown in the 18th century, are now within the useful Arts. It is possible to take things a step further: the vacuum tube is historically an accidental outgrowth from and akin to the electric light-bulb, so that it may properly be argued that incremental steps illustrate an evolution from candle-making to the vacuum tube.

These examples show that some difficulties may be perceived (as in the last example) in applying the incremental approach of extrapolating from agreed-upon instances of useful Arts. But the difficulties are not insurmountable. Therefore, unless and until a better proposal is advanced, this seems to be the most useful way to approach the problem of determining whether something is within the useful Arts.

**Business-method patents and patent-eligibility**

Until the Federal Circuit's *State Street* decision in the late 1990s, it was unanimously accepted that the US patent system did not extend to business methods. For example, one court of appeals decision upheld the patent office's refusal to issue a patent on a method for determining optimal whiskey blends by blind-testing samples of different blends, because:

"... to give appellant a monopoly, through the issuance of a patent, upon so great an area in the field of marketing and determination of consumer preference, would in our view impose without warrant of law a serious restraint upon the advance of science and industry."  

A return to this principle in the name of constitutional wisdom would thus not be far from what was the mainstream of thinking.

The 18th century's exclusion of trade and commerce from the useful Arts, as Washington's letter to Lafayette illustrates, argues strongly against considering business methods to be within the scope of the useful arts for patent-eligibility purposes. So, too, does the absence of business-method patents from the catalogue of colonial patents during the early 18th century. A ruling that business methods, whether claimed as processes or machine systems, are outside the reach of s.101, either as a matter of statutory construction influenced by the constitutional background or else directly as a result that art.1 § 8 cl.8 compels, would not only resolve the issues in the *Bilski* appeal but would put an end to the current controversy over the legitimacy of business-method patents by barring the door to business-method patents. The legal analysis proposed in this article supports that result.

**Conclusion**

Although it has not figured significantly so far in the evolution of legal thought on patent-eligibility in the United States, the constitutional requirement that candidates for patenting be within the useful Arts cannot be ignored. Determining the outer boundaries of this requirement may be difficult. However, a methodology based on extrapolating from known and conceded examples is workable and logically supported. A significant consequence of applying the constitutional test is that business-method patents are impermissible. That result is consistent with the widely-held policy view that such patents are socially detrimental.

89 *State Street* 149 F.3d 1368 (1998).  