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WHAT CAN BE PATENTED? TECHNOLOGICAL INNOVATION AND THE CONTEMPORARY MESS IN PATENT LAW

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Abstract. The question of what types of inventions may be patented has become highly contentious in patent offices, law courts, legislatures, scientific organizations, international trade forums and various social advocacy groups. The patentability of computer software inventions, DNA-based products, new business techniques, medical diagnostic methods, or complex systems operating over the Internet, for example, have come under question. This paper addresses this topic by presenting the results of a comparative study of statutory law and case law in the United States and Europe concerned with what subject matter is patent eligible. In particular, the paper explores whether only technical inventions should be eligible for patent protection and, if so, whether those inventions must be physical in order to qualify as “technology” in patent law¹.

Key words: inventions, technicity, technology, European patent law, United States patent law.

Contrasting Perspectives in American and European Patent Law to the Issue of Patent-eligible Subject Matter. The confusion and inconsistency in patent law about what type of “stuff” may be patented – and in particular whether the subject matter of patents should be coterminous with technology – has arguably always been present in both

¹ Note: This paper draws heavily upon the research work of Professor Willoughby published in the following book: Willoughby Kelvin W. *What Can Be Patented? Confronting the Confusion in Patent Law About Patent-Eligible Subject Matter*. Saarbrücken: Scholars’ Press, 2014.

American law (i.e., the law of the United States of America) and European law (i.e., the law of both the European Patent Convention and of individual European countries), and to a lesser degree in the newer patent jurisdictions of Asia. During the last several decades, however, the confusion and inconsistency appears to have grown on both sides of the Atlantic, although it has done so differently in the United States than it has in Europe.

In Europe, under the terms of the European Patent Convention and in the practice of the European Patent Office, patents are permitted only for technology. More precisely, European patents may only be issued for new inventions involving a technical solution to a technical problem. In the United States, in contrast, there is no explicit mention of technology in the patent statutes and no explicit requirement that patents should be restricted to technology. Rather, patent law in the United States draws upon the concept of the “useful arts” from the U.S. Constitution, expressed in the four statutory categories of patent-eligible subject matter: processes, machines, manufactures, and compositions of matter, as well as any new and useful improvements to inventions in any of these categories. There are some who argue that the term “useful arts” from the U.S. Constitution has the same meaning as “technological arts” and that the several categories of patent-eligible subject matter in the United States Code together constitute the boundaries of what most people would call “technology.”

Nevertheless, the U.S. courts have generally refused to articulate a “technology” requirement for patentable inventions and have resisted adopting a general, philosophically coherent definition of patent-eligible subject matter that codifies the underlying concept behind the several categories mentioned in the patent statutes. This has led to a widespread perception that patent protection may be obtained in the United States for non-technical subject matter. However, many in the judiciary and the patent office believe that it is inappropriate for the scope of patentable subject matter to be drawn so broadly and, as a consequence, often reject applications for patents that, according to a literal interpretation of the statutes, are clearly patentable. Additionally, the United States Supreme Court has promulgated several judge-created exceptions to patent-eligible subject matter, namely, abstract ideas, laws of nature and physi-

cal phenomena. Unfortunately, however, there is much confusion in U.S. patent jurisprudence as to the meaning of these terms, especially when they are applied to processes or methods. The end result has been inconsistency and ambiguity in the decision-making of the courts and the patent examiners.

While European patent law has an ostensible advantage over United States patent law, stemming from its definitional acuity and its simple requirement that patents may only be issued for technical inventions, that advantage turns out to be ephemeral due to the failure of those in the European patent system to adequately define the meaning of the terms “technical” or “technology” that lie at the heart of their system. There is a shocking level of vagueness at the very core of European patent law that adversely affects decision-making about patents in Europe. Thus, an enigma of modern patent law is that while it is almost universally presumed by professionals in the world of patents that patent protection is intended only for technology, it has become almost impossible to apply that idea consistently in practice – because that concept has not been formally codified in U.S. law and, while in Europe it has been codified, it has not been adequately defined.

Confusion Between “Physical” and “Technical” in Patent Jurisprudence. An unfortunate result of this lacuna in the law is that, on both sides of the Atlantic, judges and patent examiners have substituted the concept of “physical” for the concept of “technical” in deciding whether or not an invention is eligible for patenting. In other words, for want of a cogent concept of “technology,” a trend has emerged in Europe and the United States for patent applications for intangible technical inventions to be rejected simply on the grounds that they are not physical. This is a problem partly because it is a misapplication of the basic patent statutes on both continents, but also because it proscribes patent protection for some of the most valuable types of technology. Novel and useful inventions in contemporary technological fields – such as computer software technology, genomics technology, medical diagnostic techniques or big-data analytics based on sophisticated algorithms – are being refused patent protection simply because they do not look and feel like the machines and materials that dominated the world of technology prior to the twentieth century.

Physicality and Technicity in Constitutional, Statutory and Case Law

Patentable Subject Matter: Physicality and Technicity
 Patent-Eligible Subject Matter Under Various Legal Settings and Cases

		Technicity		
		Does a patent-eligible invention need to be technological?		
		Yes	Ambiguous	No
Physicality	No	US Constitution (1787) [probably]; US patent statute (1790); <i>US Patent Act</i> (1952) [probably]; <i>TRIPS</i> ; <i>Tilghman v. Proctor</i> (1880); USPTO: <i>Morse</i> (1853); <i>Russell</i> (1922); <i>In re Musgrave</i> (1970); <i>Diamond v. Chakrabarty</i> (1980); <i>Diamond v. Diehr</i> (1981) [party]; <i>Vicom</i> (1986); <i>Arythmia v. Corazonix</i> (1992) [party]; <i>In re Allappat</i> (1994) [party]; <i>State Street Bank</i> (1998); <i>AT&T</i> (1999); EPC (2000) [statute]; <i>Henz</i> (2002); <i>Ex parte Lundgren</i> (2005) [party]; <i>Microsoft</i> (2006); <i>Symbian</i> (2008) [probably]; <i>Programs for computers</i> , G 0003/08 (2010); <i>Research Corp. Technologies</i> (2010); <i>Ultramicro</i> (2011); <i>CLS v. Alice</i> [CAFC] (2012); <i>SAP</i> (2014); "Willoughby's Proposed Law" (2014).	US Constitution (1787) [maybe]; <i>US Patent Act</i> (1952) [maybe]; <i>State Street Bank</i> (1998) [maybe]; <i>AT&T</i> (1999) [maybe]; <i>In re Bilski</i> , dissent [Rader] (2008); <i>Classen</i> [CAFC], dissent [Moore, Rader] (2008); <i>CLS v. Alice</i> [CAFC] (2012) [maybe]; [Perhaps some biotechnology/genomics patents fall in this category]	[Perhaps some genomics patents or business method patents fall in to this category, in addition to some poorly examined, questionable or inappropriately issued patents]
	Ambiguous	Venetian statute (1474); South Carolina statute (1784); German statute (2008); British jurisprudence (post-1977); <i>Cochrane v. Deener</i> (1876); <i>In re Toma</i> (1878); <i>Diamond v. Diehr</i> (1981) [party]; <i>Bauk v. Rizkalla</i> (1985); <i>Koch & Sterzel</i> (1987) [probably]; <i>Arythmia v. Corazonix</i> (1992) [party]; <i>IBM/Computer program product</i> (1998); <i>Comvik</i> (2002) [probably]; <i>Geodynamik HT Aktiebolag</i> (2002) [party]; <i>Duns Licensing Associates</i> (2006); <i>Infincon Technologies</i> (2006) [maybe]; <i>In re Comiskey</i> (2007); <i>Symbian</i> (2008) [maybe]; <i>Harex</i> (2013) [probably]; <i>Continental Automotive Systems</i> (2013) [probably]; EPO practice (overall).	Paris Convention; EPC jurisprudence (overall); US jurisprudence (overall); <i>FCT</i> (1979); EPC (1973) (statute); German statute (pre-2008); Statute; Canada; <i>Strasbourg Convention</i> (1963); <i>LabCorp v. Metabolete</i> (2006); <i>Mayo</i> (2010); <i>Myriad III</i> [Supreme Court] (2012); <i>Myriad V</i> [Supreme Court] (2013); USPTO practice (overall).	<i>Bilski</i> (2010), Supreme Court [party]; [Perhaps some genomics patents or business method patents fall in to this category, in addition to some poorly examined, questionable or inappropriately issued patents]
	Yes	British jurisprudence (pre-1977); Statutes: Japan, Korea, Taiwan, China; German jurisprudence; Purported EPC jurisprudence; <i>Burr v. Duryee</i> (1863); <i>Gottschalk v. Benson</i> (1972); <i>Parker v. Flook</i> (1978); <i>Koch & Sterzel</i> (1987) [maybe]; <i>IBM/Spelling checking</i> (1989); <i>ESCC</i> (1989); <i>In re Allappat</i> (1994) [party]; <i>Mitsubishi</i> (1995); <i>Pension Benefits Systems Partnership</i> (2000); <i>Geodynamik HT Aktiebolag</i> (2002) [party]; <i>Comvik</i> (2002) [possibly]; <i>Hitachi</i> (2004); <i>Ex parte Lundgren</i> (2005) [party]; <i>Ex parte Bilski</i> (2006); <i>Aerotel / Macrossan</i> (2006); <i>Infincon Technologies</i> (2006) [probably]; <i>Gamaccourt</i> (2007); <i>Harex</i> (2013) [maybe]; <i>Continental Automotive Systems</i> (2013) [maybe].	Statute of Monopolies (1623); English Common Law patent doctrines; Statutes: Australia, New Zealand; <i>Freeman-Walter-Aberle Test</i> ; <i>Classen</i> [District Court] (2005); <i>Classen</i> [CAFC] (2008); <i>Prometheus</i> [District Court] (2008); <i>CyberSource</i> [District Court] (2009); <i>CyberSource</i> [CAFC] (2009); <i>Myriad I</i> [District Court] (2010); <i>Myriad II</i> [CAFC] (2011); <i>Myriad IV</i> [CAFC] (2012); <i>Prometheus</i> [CAFC] (2011); <i>CLS v. Alice</i> [District Court] (2011); [perhaps, most chemical patents fall here]	<i>In re Bilski</i> (2008); [Many chemical patents probably fall in this category]

The problem on both sides of the Atlantic – in both the constitutionally-informed Common Law tradition of the United States and the Civil Law tradition of continental Europe – of “physicality” being employed as a substitute for “technicity” in patent jurisprudence, is neither unusual nor new. From the beginnings of European patent law in Venice in the fifteenth century, through its gradual resurgence following the English Statute of Monopolies in the seventeenth century, through the emergence of modern patent law in late eighteenth-century United States, in to the flowering of contemporary patent law worldwide during the latter half of the twentieth century, a rich panoply of opinions, ploys, perspectives and positions has been proffered in the law of patent-eligible subject matter. This diversity of thought and doctrine may be observed in statutory law, case law and constitutional law; and as patent law has spread from the United States and Europe to the rest of the world, it is also visible in the prominent jurisdictions of Asia, Russia and the other post-Soviet countries.

A full spectrum of examples may be drawn, across time and across geography, regarding answers to the following two questions:

1. Does an invention need to be physical to be patent eligible?
2. Does an invention need to be technical to be patent eligible?

The accompanying table¹ contains a summary of my effort to classify a wide variety of instances of patent law or patent-related law, including patenting decisions of patent offices, according to how they address these two questions. Many fall in to extreme “yes” or “no” positions in response to either or both of these two questions, while many others are fundamentally ambiguous. Thus, no simple solution to the current conceptual mess in patent law may be found by resorting to orthodoxy. Fresh thought is required.

A Solution to the Problem? After reviewing highlights of contemporary patent law and patent cases in the United States and Europe, I propose that a solution to the apparently interminable problems of contemporary patent law and practice in the United States and Europe in the domain of patent-eligible subject matter may be solved by the legislatures, courts and patent offices embracing the following three propositions:

1. **Patent protection should only be issued for technology.** In other words, only technological inventions (assuming, of course, that they will also be subject to the other statutory conditions of patentability) should be eligible for patent protection. This means that inventions that are not technological should not qualify as comprising patent-eligible subject matter.

2. **Technology is not necessarily physical.** This means that an invention should not need to be physical, or to have an effect-upon or make a contribution-to another invention that is physical, or anything else physical, in order to qualify as a technology for the purposes of patent law.

3. **A robust and simple definition of technology, for the purpose of patent law, needs to be adopted.** This definition needs to be close enough to widely held common sense notions of technology to be com-

¹ Willoughby Kelvin W. What Can Be Patented? Confronting the Confusion in Patent Law About Patent-Eligible Subject Matter. Saarbrücken: Scholars' Press, 2014. P. 171.

prehensible to the normal educated person yet sufficiently precise to permit rigorous analysis *vis-à-vis* patent law.

The reasons for making the above propositions are as follows.

Legal Certainty. First, there does appear to be considerable dissension and confusion in the patent communities of the United States and the member states of the European Patent Convention over precisely what kind of subject matter is eligible for patent protection. While, at first glance, both legal regimes do possess what appear to be straightforward statutes and rules about patent-eligible subject matter, it turns out, on closer examination, that these statutes and rules (which have their roots in the jurisprudence and technological environments of previous centuries) are not so easy to interpret in a consistent manner in the context of the 21st Century (characterized by the existence of new types of technologies, new nomenclature for new technology-practice, and changes in the common meanings of old words). Thus, the legal certainty that inventors, investors, technology developers and those who depend upon them expect from the patent laws has turned out to be elusive – ironically, just at the time when the basis of wealth creation and economic development in the world's economies depends more than ever upon the ostensible subject matter of patents, namely, technology. Thus, more cogent definitions of basic patent-eligible subject matter are needed, in both Europe and the United States, to bring more legal certainty to patent law.

Precaution Against Inappropriate Granting of Monopoly Rights. Second, given that in both Europe and the United States there is a natural reluctance to extend monopoly rights over economic assets inappropriately, it is very important – in the situation where exclusive economic rights (monopolies) are granted by governments, such as is the case with patents – that the boundaries of those rights be rationally defined, carefully chosen and awarded in a predictable and transparent manner. Defining patent-eligible subject matter more cogently will help ensure that the exclusive rights of patent holders are not granted unless they are, in fact, justified. This concern is doubly important in view of the fact that the current anti-I.P. movement appears to be growing more strident in its opposition to the patent system.

Technology is the Presumptive Subject Matter of Patents. Third, despite all the debates we have reviewed in this book about what, as a mat-

ter of law, the appropriate subject matter of patents ought to be, the reality is that there is an almost universal common-sense understanding – possessed both by educated people in general and by informed members of the legal profession – that patent protection is meant for new technology. A significant number of jurisdictions, including the EPC, now express this notion explicitly in their patent statutes. Almost nobody involved in the field of patent law suggests that patents are not intended for technology; it is just that not everybody believes it is appropriate or necessary to say so in the statutes or to define what it means. However, given that the whole edifice of patent law is arguably built on the conceptual foundation of something called “technology,” it does seem important to define at least this thing clearly. In any case, the profusion of court cases that has arisen about this question suggests that more definitional acuity would be helpful.

Reduction in the Waste of Resources. Fourth, greater cogency and consistency in statutory definitions and judicial interpretations of patent-eligible subject matter, particularly *vis-à-vis* the question of whether or not patentable inventions need to be technical inventions, would help reduce the amount of time and money spent by applicants and litigants on patent cases, not to mention enabling greater efficiency in the administration and execution of examinations in patent offices. Perhaps some of those who currently make money through providing professional services to those caught up in legal disputes over the legitimacy of patents would prefer the status quo to remain intact? ...but that should not be an acceptable reason for allowing unhelpful ambiguity in the law to be maintained.

Defining Technology for the Purpose of Patent Law is Not Such a Formidable Task. Fifth, despite the fact that it has become almost a truism amongst members of the patent community that it is impossible to define technology, a good number of reasonably persuasive attempts to do so have been made. Unfortunately, there is insufficient space here to elaborate on this topic fully, beyond observing that the basic elements of what makes an artifact a technology and how those elements might be portrayed in a definition have already been identified by a number of analysts. It also seems to this writer that defining important subject matter for the purpose of law is one of the basic responsibilities of lawyers;

and, given that technology is unquestionably important subject matter for patent law, it seems inappropriate for patent lawyers to shy away from trying to define the thing (technology) that is at the heart of their profession. Fulfilling this quest will no doubt take considerable effort and intelligence... but surely that does not make the task either impossible or inappropriate to pursue?

Conclusion

In summary, the conclusion of this paper is that patent law and patent practice will function best if the subject matter that is treated as eligible for patent protection is restricted to that of technology. This conclusion rests on the condition that a robust definition of technology is adopted for the purposes of patent law that does not treat physicality as a proxy for technicality.