

## THE EUROPEAN PATENT SYSTEM: AN OVERVIEW AND CRITIQUE

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## I. INTRODUCTION

A patent is a government-granted property right in an invention.<sup>1</sup> Typical rights conferred include the right to prevent use or sale of the patented invention.<sup>2</sup> A patent is a policy instrument designed as a trade-off to avoid secrecy in industry and promote knowledge and progress in society.

“The core of the utilitarian argument for patents is that free competition will generate an under-optimal rate of inventions, [because of] the ‘public good’ characteristic of knowledge.”<sup>3</sup> Society is therefore concerned with complementing a free market with a patent system. A patent system is seen as a way to encourage additional innovation. The knowledge disclosed in a patent application ultimately becomes public knowledge, thereby benefiting society.<sup>4</sup>

Because knowledge does not take tangible form, knowledge is “even more public than other public goods such as roads.”<sup>5</sup> To determine why a patent system is necessary to encourage disclosure of knowledge for the public good, we look to the economic aspects of invention.<sup>6</sup>

First, the cost of any inventive step is a sunk cost.<sup>7</sup> It is the cost that the inventor must incur through experimentation, supplies, and time before that cost can be recouped through marketing.<sup>8</sup> The inventor runs the risk of never being able to recoup this cost if the invention is not marketable.

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1. U.S. Patent and Trademark Office, Glossary <http://www.uspto.gov/main/glossary/index.html#p> (last visited Apr. 10, 2010).

2. *Id.*

3. DOMINIQUE GUELLEC & BRUNO VAN POTTELSBERGHE DE LA POTTERIE, THE ECONOMICS OF THE EUROPEAN PATENT SYSTEM: IP POLICY FOR INNOVATION AND COMPETITION 49 (2007).

4. *See id.* at 5, 8 (discussing the application process through the publishing process). Patents are not rewards for past accomplishments; rather, they are incentives to innovate. *Id.*

5. *Id.*

6. *See id.*

7. *Id.*

8. *See id.*

Second, to reinvent “an existing piece of knowledge is a waste of social resources.”<sup>9</sup> After invention, it is in the best interest of society that free and unlimited right to use is available to all possible users.<sup>10</sup>

Third, the invention may be of more benefit to other possible users than it is to the inventor. Indeed, the private inventor’s benefit from an invention is often lower than the benefit to society.<sup>11</sup>

Fourth, “as the private return is lower than the social return, certain inventions whose social return would justify the expenditure needed to obtain them will not be made due to insufficient private return.”<sup>12</sup> If the inventor’s benefits from the invention are too small, then the investment is not justified. “Hence the competitive market mechanisms might not generate as many inventions as society would be willing to have.”<sup>13</sup>

Fifth, “a competitive market could make things even worse, as an inventor must charge a price that will allow him to recoup his fixed cost while his competitors/imitators can charge just their marginal cost, hence driving the inventor out of business.”<sup>14</sup> Companies who see this problem will not be willing to make an investment into the inventor’s research. Without some type of legal protection, inventors and companies would have no economic incentive to disclose their inventions. These inventions would be kept secret, and others would have to reinvent—a process that would, by its nature, waste societal resources. “These various economic attributes of knowledge call for intervention by the government.”<sup>15</sup>

The patent system solves this problem. It is a barrier that makes an invention the exclusive property of the patent owner

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9. *Id.*

10. *Id.* The inventive cost, at this point, is finished. *Id.*

11. *Id.* The patent system allows the inventor to obtain his or her return, but gives more to society as a whole. *Id.*

12. *Id.* at 49–50.

13. *Id.* at 50.

14. *Id.* There is little incentive to invent and share if competitors may freely take advantage of the innovator’s invention. *Id.*

15. *Id.*

for a limited time.<sup>16</sup> Under this system the patent owner can license the invention to others, or keep exclusivity, in order to obtain economic reward.<sup>17</sup> In fact, “this exclusive right can translate into an [extra reward] beyond the normal competitive profit, that could allow recouping the cost of research and compensating for the risk.”<sup>18</sup> Therefore, economic benefit is promising and encourages further innovation.<sup>19</sup>

The patent system is also a trade-off between secrecy and disclosure. In exchange for the inventor’s disclosure, exclusive rights to the invention are granted for a limited time. In Europe, “patents are a contract between the inventor and society, by which society grants [a] transitory monopoly to the inventor in exchange for disclosure.”<sup>20</sup> This idea supports patent offices’ requirements that the invention must be disclosed.<sup>21</sup>

This paper will examine the problems facing the European patent system, including issuance and enforcement of a patent, the workload of the patent office, and specific types of debatable subject matter.

## II. HISTORY

### A. *French Patent Law of 1791*

In the late eighteenth and early nineteenth centuries patent laws were passed in numerous countries, including the United States in 1790,<sup>22</sup> France in 1791,<sup>23</sup> Spain in 1811,<sup>24</sup> Prussia in 1815,<sup>25</sup> and the Netherlands in 1817.<sup>26</sup> The importance the

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16. *See id.*

17. *Id.*

18. *Id.*

19. *See id.* A patent is considered an intellectual property right. *Id.*

20. *Id.*

21. *Id.* at 51. This idea originated from decisions of British judges. *Id.* at 50–51.

22. *Id.* at 22.

23. *Id.* at 21.

24. *Id.*

25. *Id.*

26. *Id.* at 24.

industrial revolution placed on technical change was a major factor in the adoption of these laws.<sup>27</sup>

The French law became the model for most European and Latin American patent laws.<sup>28</sup> France's 1791 law "presents intellectual property as a natural right of the individual, of the same kind as any other type of property."<sup>29</sup> France's view was that an invention's value was to be judged by society, and not by the government.<sup>30</sup> Any problems or claims were to be solved by the judiciary.<sup>31</sup> Limited durations of five to fifteen years were granted on patents under this law.<sup>32</sup>

### *B. The Paris Convention*

The first relevant international convention to the European Patent System was the Paris Convention in 1883.<sup>33</sup> Although the major focus of this convention was not patent law, it marked the first time that there was international cooperation in patent law. Even though relatively few aspects of patent law were discussed during the Paris Convention, the Convention opened the door for future cooperation.<sup>34</sup> The Paris Convention has "been revised six times since its inception, the last time . . . in Stockholm, in 1967."<sup>35</sup> Throughout these revisions, restrictions on the right to exercise patent rights have been decreased. The United States began to press for international agreements to include patent rights, and the result was the Trade Related IP agreements (TRIPs) of 1994.<sup>36</sup>

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27. *Id.* at 21. This was also related to strengthening economies and state governments. *Id.*

28. *Id.* at 22.

29. *Id.* at 21.

30. *Id.*

31. *Id.*

32. *Id.*

33. GERALD PATERSON, *THE EUROPEAN PATENT SYSTEM: THE LAW AND PRACTICE OF THE EUROPEAN PATENT CONVENTION* 11 (1992).

34. *Id.*

35. See GUELLEC & VAN POTTELSBERGHE, *supra* note 3, at 25.

36. *Id.* at 25–26. The United States had begun to push for this in the 1980s. *Id.*

Currently TRIP compliance is overseen by the World Trade Organization (WTO).<sup>37</sup> Previously, international intellectual property law was supervised by the World Intellectual Property Organization (WIPO).<sup>38</sup> The change is relevant because the WTO has enforcement and punishment power, whereas the WIPO does not.<sup>39</sup> Essentially, the major features of TRIPs are that “patents should apply to all fields of technology; the minimal duration for patents is 20 years after filing; and no working requirement should be imposed except in exceptional circumstances.”<sup>40</sup>

### *C. Patent Cooperation Treaty*

On June 19, 1970, in Washington, D.C., the Patent Cooperation Treaty (PCT) was signed.<sup>41</sup> Although the current European Patent System is independent from the PCT,<sup>42</sup> the PCT is still relevant because it shows how the European System interacts with the rest of the world. Procedurally, the PCT allows an applicant to file what is known as an international application in any of the ratifying countries. As long as all formal requirements are complied with, the international application has the potential to become a patent in every ratifying country which the applicant designates in the international application.<sup>43</sup>

The international application is searched by a WIPO-appointed patent office.<sup>44</sup> These offices include the U.S. Patent and Trademark Office (USPTO), Japan Patent Office (JPO), and the European Patent Office (EPO).<sup>45</sup> Although the application is searched in a WIPO-appointed office, the examination and grant of any patent remain tasks for each of the countries designated

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37. *Id.* at 26.

38. *See id.*

39. *Id.*

40. *Id.* Countries that wished to develop patent systems were given up to fifteen years to do so. *Id.*

41. *Id.* at 156.

42. *See* E. ARMITAGE ET AL., *THE NEW EUROPEAN PATENT SYSTEM* 4 (1976).

43. *Id.* at 4–5.

44. GUELLEC & VAN POTTELSBERGHE, *supra* note 3, at 26.

45. ARMITAGE ET AL., *supra* note 42, at 5.

by the applicant.<sup>46</sup> However, the applicant under the PCT does “benefit from [a] search report, which gives [the applicant] information on the likelihood of their having the application granted [and] which claims are . . . less robust.”<sup>47</sup>

“The PCT has experienced several changes since its inception, all making it friendlier to the applicant and ever closer to being a real patent application.”<sup>48</sup> In January 2004 the Written Opinion of the International Search Authority (WOISA) was created.<sup>49</sup> The WOISA is a “preliminary, non-binding opinion of the examiner regarding the prospect for patentability of the invention . . . includ[ing] certain aspects of examination.”<sup>50</sup> Some countries argue that a worldwide patent should be granted as a result of a PCT application.<sup>51</sup>

“In addition, negotiations have been conducted at the WIPO regarding the harmonization of national administrative procedures, resulting in the Patent Law Treaty (PLT) of 2004.”<sup>52</sup> Further negotiations intended to synchronize worldwide patent law substantively began in 2004.<sup>53</sup> For the most part, developed countries were unified; however, negotiation failed because “certain developing countries led by Brazil would request more stringent disclosure for certain matters (the origin of biological [matter] used for genetic inventions)[, but] protection of ‘traditional knowledge,’ [was] strongly resisted by the pharmaceutical industry and [the United States]”<sup>54</sup>

#### *D. Strasbourg Convention*

While international agreements were being made with respect to patent law, Europe was developing its own agreements exclusively among European nations. The Council of Europe, established in 1949, provided a forum for discussion

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46. GUELLEC & VAN POTTELSBERGHE, *supra* note 3, at 26.

47. *Id.*

48. *Id.*

49. *Id.*

50. *Id.*

51. *Id.*

52. *Id.*

53. *Id.*

54. *Id.* at 26–27.

that would lead to European patent law's further internationalization.<sup>55</sup> The Strasbourg Convention came out of talks to unify Europe on both procedural and substantive requirements of patent law.<sup>56</sup> The key purpose of this convention was to unify the patent system throughout Europe, thereby encouraging industry and invention in all of Europe.<sup>57</sup> The Council of Europe also called for implementation of the EPO.<sup>58</sup>

Procedural requirements, including requirements for obtaining a patent application's filing date and requirements for later stages of prosecution, were adopted in this convention, eventually adopted in the PCT, and later adopted in the European Patent Convention (EPC).<sup>59</sup> As to substantive requirements, the major ideas of the European patent were drafted at this convention because of the interest in a common European market. These provisions were later incorporated into the EPC with minimal changes.<sup>60</sup>

#### *E. The European Patent Convention*

Officially titled "The Convention on the Grant of European Patents," the EPC was taken place between September 10 and October 5, 1973.<sup>61</sup> It is only open to European countries.<sup>62</sup> In establishing the internal rules for a European patent, the EPC's primary function was to set up the EPO.<sup>63</sup>

"The EPO is a stand-alone body, unrelated to other European institutions such as the European Commission."<sup>64</sup> Its administrative council is comprised of member-state

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55. PATERSON, *supra* note 33, at 15.

56. *Id.* at 15–16.

57. *See id.* at 16.

58. GUELLEC & VAN POTTELSBERGHE, *supra* note 3, at 27.

59. PATERSON, *supra* note 33, at 16.

60. *See id.* at 16.

61. ARMITAGE ET AL., *supra* note 42, at 5.

62. *Id.*

63. GUELLEC & VAN POTTELSBERGHE, *supra* note 3, at 27.

64. *Id.*

representatives. The EPO is financed through application and renewal fees as well as fees from member states.<sup>65</sup>

A European Patent Application, that is, an application filed under the EPC, must be filed in one of the EPC's official languages: English, French, or German.<sup>66</sup> European Patent Applications are to be filed in Munich at the EPO's main office, or through a national patent office.<sup>67</sup> If a patent is granted as a result of a European Patent Application, then the resulting patent has the same effect in all designated EPO countries as a national patent in each designated country would.<sup>68</sup> This concept is generally called a "bundle of patents."<sup>69</sup>

In essence, obtaining such a bundle is simple: A single European Patent Application is filed with the EPO. The applicant designates EPC member countries in which he or she wishes to have patent rights should a European Patent ultimately be granted. If the patent is granted, the applicant now has a patent enforceable in all EPC countries that he or she has designated.<sup>70</sup>

This system allows an applicant to avoid filing an application in every European country, a process that would be quite expensive and time-consuming. Also, under this system, member countries are able to maintain sovereignty over patent enforcement because the EPC established that patent rights must be administered and enforced in each designated country.<sup>71</sup>

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65. *Id.* at 27. Austria, Belgium, Bulgaria, Switzerland, Cyprus, the Czech Republic, Germany, Denmark, Estonia, Spain, Finland, France, the United Kingdom, Greece, Hungary, Ireland, Iceland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Monaco, the Netherlands, Poland, Portugal, Romania, Sweden, Slovenia, Slovakia, and Turkey are members of the EPO. *Id.* at 28.

66. ARMITAGE ET AL., *supra* note 42, at 20.

67. *Id.* at 21. The EPO originally conducted searches for novelty in Benelux countries (Belgium, the Netherlands, and Luxembourg) and France. GUELLEC & VAN POTTELSBERGHE, *supra* note 3, at 27.

68. See ARMITAGE ET AL., *supra* note 42, at 6.

69. PATERSON, *supra* note 33, at 20.

70. *Id.* at 22–23. An applicant may designate any state which has ratified the EPC. *Id.*

71. *Id.* at 19–20.

The EPC is the law in Europe, but it is not without problems. It has drawn criticism for being expensive and difficult to navigate.<sup>72</sup> For decades the European Commission has attempted to create a more unified and user-friendly system with a single court system for enforcement.<sup>73</sup>

*F. The Community Patent Convention*

In 1975, the Community Patent Convention (CPC) set out to solve this problem via the community patent system.<sup>74</sup> This system had already been discussed and attempted during the Strasbourg Convention; however, that attempt was unsuccessful because the United Kingdom did not join.<sup>75</sup>

The first CPC likewise failed. “The Community Patent Convention was signed in Luxembourg in 1975 by the then nine Member States, but for political reasons relating to certain Member States the CPC did not then come into force.”<sup>76</sup>

In Luxembourg in 1985, another conference took place to implement the community patent system, including setting up the protocol for establishing the judicial system for community patents and establishing conditions on nations joining the EPC after 1975.<sup>77</sup> However, although the same political reasons prevented some progress, the protocol for establishing the judicial system was completed.<sup>78</sup>

The Conference established “[a]n Agreement relating to Community Patents [and] enabled general recognition of the political problems which required solution before the [other] objectives would be achieved.”<sup>79</sup> The relevant portions of this agreement, the Single European Act, state that “[t]he Community will take the necessary measures [] to bring the

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72. Gareth Morgan & Taylor Wessing, *London Agreement Ushers in New Era for European Patents*, WORLD INTELL. PROP. REP., Mar. 2008, at 34, 34.

73. *Id.*

74. PATERSON, *supra* note 33, at 21.

75. *Id.* at 16.

76. *Id.* at 21. This failure was also caused by the United Kingdom’s failure to join. *Id.*

77. *Id.*

78. *Id.*

79. *Id.*

internal market into existence in stages by December 31, 1992” and “[t]he internal market will comprise an area without internal frontiers, in which the free movement of goods, persons, services and capital is guaranteed in accordance with the terms of this Treaty.”<sup>80</sup> Unfortunately, all CPC attempts to date have failed.<sup>81</sup>

The CPC is desirable because a unitary system of enforcement and simple language rules would greatly reduce the cost of patents in Europe. EPC members have attempted to institute rules that would mirror the proposed CPC system by utilizing the European Patent Litigation Agreement (EPLA) and the London Protocol. “The [EPLA] would establish a centralized court system in Europe for patent related matters (including revocation and infringement cases), [but] the [London Protocol] would simplify translation requirements.”<sup>82</sup> To date, the London Protocol has been approved, but the EPLA has not.<sup>83</sup>

### III. EUROPEAN PATENT PRACTICE

#### A. *Extent of Protection and Rights Conferred*

Before the EPC “there was no uniformity of approach in Europe . . . of the extent of protection . . . conferred by a national patent and thus [no uniformity as to] what constituted infringement of such a patent.”<sup>84</sup> After the EPC there is uniformity in the extent of protection.<sup>85</sup> “The protection conferred by a patent is determined by the terms of the claims

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80. *Id.* at 21–22.

81. *See id.*

82. GUELLEC & VAN POTTELSBERGHE, *supra* note 3, at 29.

83. Agreement on the Application of Article 65 of the Convention on the Grant of European Patents, Oct. 17, 2000, 2001 OFFICIAL J. EUR. PAT. OFF. 550, *available at* [http://archive.epo.org/epo/pubs/oj001/12\\_01/12\\_5491.pdf](http://archive.epo.org/epo/pubs/oj001/12_01/12_5491.pdf); European Patent Office, The European Patent Litigation Agreement (EPLA), <http://www.epo.org/topics/issues/epl.html> (last visited Apr. 10, 2010). “I.e., signatory states would not necessarily request that a patent be translated in their own language in order to be validated, but rather a language they have designated from a choice of English, French or German.” GUELLEC & VAN POTTELSBERGHE, *supra* note 3, at 29.

84. PATERSON, *supra* note 33, at 456.

85. *Id.*

(Article 69(1) EPC), and in particular by the categories of such claims and their technical features.”<sup>86</sup>

“Article 69 EPC and its Protocol are to be applied[] both in proceedings before the EPO and in proceedings within the Contracting States, whenever it is necessary to determine the protection which is conferred.”<sup>87</sup> However, the rights conferred to a patent holder, including rights in an infringement proceeding, are left solely to EPC member states.

In other words . . . [the] determination of the “extent of protection conferred” by a patent under Article 69(1) EPC is a determination of *what* is protected, in terms of category plus technical features; whereas the “rights conferred” by a patent are a matter solely for the designated contracting states, and are related to *how* such subject-matter is protected.<sup>88</sup>

### *B. EPO Procedures*

Currently the EPO is comprised of thirty-one states and five extension states.<sup>89</sup> The European Patent System is quite “complex and costly . . . as a patent must . . . be validated, put in force, and renewed in each national patent system, with its own legislation and its own fees structure.”<sup>90</sup>

Usually “applicants start with a national filing, commonly called a priority filing.”<sup>91</sup> The priority filing establishes the priority date of a patent application. For one year after the priority date, an applicant may extend an application to other countries under the Paris Convention.<sup>92</sup> The applicant may also obtain a thirty-month period to decide which countries to designate by filing an international application with the WIPO

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86. *Id.* at 460.

87. *Id.*

88. *Id.* (quoting Board of Appeal Decision G2/88, 1990 OFFICIAL J. EUR. PAT. OFF. 93, 101, available at [http://archive.epo.org/epo/pubs/oj1990/p093\\_185.pdf](http://archive.epo.org/epo/pubs/oj1990/p093_185.pdf)).

89. GUELLEC & VAN POTTELSBERGHE, *supra* note 3, at 155–56.

90. *Id.* at 156.

91. *Id.* Applicants are allowed to use this date as their filing date for a future EPO application. *See id.* at 156–57.

92. *Id.*

under PCT rules.<sup>93</sup> “Partly as a function of a consideration of expected profits and targeted markets, applicants must [m]ake the decision of whether to file nationally, regionally, and/or internationally.”<sup>94</sup> As a result, EPO applications are usually secondary from a PCT application or an EPC member application.<sup>95</sup>

If an applicant wishes to receive protection in only one country, the applicant will probably file a national patent application in that state, rather than through the EPO. This is so because it is less expensive to obtain a national patent than a European patent.<sup>96</sup> An applicant could likewise file in several countries, or even all EPC member countries, and obtain the same rights conferred as a European Patent, although this latter option would neither be cost-effective nor efficient.<sup>97</sup>

There are some conclusions to be made about the European patent process. “First, it is possible to bypass the EPO for an effective protection in several European countries,” even though most patent filings seeking protection in more than three EPC member states actually apply at the EPO.<sup>98</sup> Also, the applicant must know a clear patenting strategy before filing, so that the applicant can most efficiently obtain protection in the desired countries. Third, the European patent “process can be highly complex and reflects a fragmented European market for technology, as a granted patent must be managed at the national level of each EPC member state.”<sup>99</sup>

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93. *Id.* at 156–57.

94. *Id.* at 157.

95. *Id.*

96. *Id.*

97. *Id.* at 156. The most frequently designated country is Germany, followed by the United Kingdom and France. *Id.*

98. *Id.* at 159.

99. *Id.*

## IV. SUBJECT MATTER

A. *Substantive European Patentable Subject Matter*

Article 52 of the EPC defines the substantive requirements to obtain a European patent.<sup>100</sup> The EPO uses the following guidelines to determine if a patent should be granted. “European patents shall be granted for any inventions which are susceptible [to] industrial application, which are new[,] and which involve an inventive step.”<sup>101</sup> However, “discoveries, scientific theories[,] mathematical methods[,] aesthetic creations[,] schemes, rules and methods for performing mental acts, playing games or doing business, and programs for computers[, and] presentations of information”<sup>102</sup> are not considered inventions. Also, “[m]ethods for treatment of the human or animal body by surgery or therapy and diagnostic methods practi[c]ed on the human or animal body shall not be regarded as inventions which are susceptible of industrial application.”<sup>103</sup> “New” means that the exact claimed invention was not known before the application was filed.<sup>104</sup> “Inventive step” means that there must be “a sufficiently large advance from the prior art” in order to obtain a patent.<sup>105</sup>

In the 1980s, the United States extended patentability to genetic material, software, and business methods.<sup>106</sup> Following this, Europe similarly allowed for patents on genetic material and software through several EPO Board of Appeal decisions.<sup>107</sup>

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100. *Id.* at 119.

101. *Id.* (quoting Convention on the Grant of European Patents art. 52, Oct. 5, 1973, 13 I.L.M. 270).

102. *Id.*

103. *Id.*

104. *Id.* at 132.

105. Robert M. Hunt, *Patentability, Industry Structure, and Innovation* 3 (Fed. Reserve Bank of Phila., Working Paper No. 01-13/R, 2004), available at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=295664](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=295664). “Prior art” means anything which had been previously invented. PATERSON, *supra* note 33, at 372. “[I]n U.S. patent law this standard is called *nonobviousness*.” Hunt, *supra*, at 2. For a U.S. claim to be obvious, the invention must have been obvious to a person of ordinary skill in the art, at the time of invention. *Id.* at 23.

106. See GUELLEC & VAN POTTELSBERGHE, *supra* note 3, at 122–30.

107. See *id.* at 122–26.

Although these areas are now unrestricted in terms of patentability, other areas remain unpatentable, and the statute itself does not explain why certain subject matter is excluded from the patent system.<sup>108</sup>

“[E]conomics recommends two tests for deciding on patentability of a field: (1) will patents encourage inventions? And (2) will patents encourage or impede the diffusion of technology?”<sup>109</sup> “Fields should be excluded from the subject matter when it is likely that patents are not needed for encouraging innovation or when they might have too detrimental [an effect] on the diffusion of technology.”<sup>110</sup>

Other than the subject matter that is specifically listed as not being an invention, the only other limit on patentable subject matter is “industrial application.”<sup>111</sup> “‘Industrial application’ has often been interpreted in Europe as meaning an application in the *manufacturing* industry (and agriculture), adding weight to the notion of technicality seen as synonymous to materiality.”<sup>112</sup> This restricted view of science and industry is the opposite of the approach taken in the United States, which does not block nonmaterial inventions.<sup>113</sup>

### *B. Biotechnology*

In the 1990s the EPO Board of Appeal gradually established that genetic material is patentable. The opinions of the EPO Board in these decisions used technical arguments to establish genetic material patentability. The Board reasoned that, “once it is isolated from the body, genetic material could be considered as an invention, not a discovery.”<sup>114</sup> However, “[o]pponents claim that living material is a discovery, not . . . an invention, as it exists in nature before being identified by researchers.”<sup>115</sup>

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108. *Id.* at 120.

109. *Id.* at 121.

110. *Id.* By using this test, it can be determined whether patents are an effective policy tool for specific subject matter. *Id.*

111. *Id.* at 121.

112. *Id.* at 121–22.

113. *Id.* at 122.

114. *Id.*

115. *Id.*

To clarify this issue the European Parliament passed the Biotech Patents Directive.

Article 5 of the directive[] allows the patenting of an element isolated from the human body or otherwise produced by means of a technical process[; t]he sequence or partial sequence of a gene may constitute a patentable invention, even if the structure of that element is identical to that of a natural element.<sup>116</sup>

After genetic material was deemed patentable in Europe, the biotechnology industry began to emerge and thrive. Many biotech companies

have no asset but their patents [and] do not have the capabilities to go downstream [to do] clinical tests or manufactur[e] drugs[;] they earn revenue by licensing or selling their patents to pharmaceutical companies, or by being taken over by these companies, which thereby acquire their patent portfolio.<sup>117</sup>

Industrial companies would be quickly imitated if not for their patents. Although genetic research likely would have occurred regardless of its patentability, this research and innovation may not have reached the same scale without patentability.<sup>118</sup>

Research may have occurred more rapidly because of the high level of competitiveness in the biotechnology industry. It seems to be considerably more competitive than the pharmaceutical industry or academia.<sup>119</sup>

The pharmaceutical industry was not as resolute in attempting to obtain biotech patents as universities were.<sup>120</sup> The pharmaceutical industry tends to see biotech as disruptive to their business. Indeed, innovation in the biotech industry

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116. *Id.* at 122–23 (internal quotation marks omitted). The biotech patents directive was passed in 1998 by the European Parliament. *Id.*

117. *Id.* at 123.

118. *Id.*

119. *Id.* This observation “was clear in the case of the decoding of the human genome, where competition between the public consortium (the Human Genome Project, HGP) and a private company (Celera) led to the invention of new techniques which allowed faster decoding of genes.” *Id.*

120. *See id.*

sometimes eliminates part of pharmaceutical business. As for academia, universities see patents as a motivation for continued biotech research.<sup>121</sup>

There are two major alternatives to patents in the biotech field.<sup>122</sup> The first is for the government to sponsor research.<sup>123</sup> This system would have the effect of forcing disclosure of results.<sup>124</sup>

The second alternative is for companies to do their own in-house research. However, this method does not lead to disclosure because a company might be apprehensive that a competitor could better utilize or market any results that it may obtain. “In fact, for fear that biotechnology companies would patent SNPs (single nucleotide polymorphisms), large pharmaceutical companies founded . . . the SNPs consortium, which identifies these entities and put[s] them in the public domain, in databases accessible on the Internet.”<sup>125</sup> Without “competition by heavily patenting biotech companies, [it is likely that] pharmaceutical companies would have worked on SNPs in the traditional way, by just keeping their findings secret and proprietary.”<sup>126</sup>

Therefore, the consequence of biotech patents is that research and public knowledge has increased and been sped along. “Biotechnology illustrates a situation that might become more frequent in the future: pure science having foreseeable business applications.”<sup>127</sup>

### C. Software

Another issue of heated public debate in Europe is that of software patents.<sup>128</sup> Software is also referred to as Computer Implemented Inventions (CII), and “[a] CII is defined as an

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121. *Id.*

122. *Id.* at 124.

123. *Id.*

124. *Id.* at 123.

125. *Id.* at 124–25.

126. *Id.* at 125.

127. *Id.* This corresponds to the relationship between academic research and business research. *Id.*

128. *Id.*

invention whose implementation involves the use of a [] computer network or other programmable apparatus, the invention having one or more features reali[z]ed wholly or partly by means of a computer program.”<sup>129</sup>

The EPC excludes computer programs from patentable subject matter. However, only computer programs “as such” are not subject to patentability. “The EPO ha[s] interpreted . . . ‘computer program[s] as such’ . . . to mean the source code.”<sup>130</sup>

This approach adopted by the EPO does not allow for patents on the most common software used in business, like spreadsheets and word processing programs.<sup>131</sup> The justification for this is that all inventions patentable when implemented by a physical device—and only those inventions—should be equally patentable when implemented by software.<sup>132</sup>

Currently in Europe “a computer program or computer-implemented invention[s] must[] have a technical character[,] solve a technical problem[,] and make a technical contribution to the state of the art.”<sup>133</sup> “[T]echnical character’ is defined as ‘teaching for technical action, solution to a technical problem’” where “‘technical’ (which is not defined in the EPC) is interpreted as ‘having an effect beyond the normal physical interaction between a program and a computer.’”<sup>134</sup>

The strongest opponents of software patents are open source code writers. They want software patents to be defeated and have tried to remove the “as such” qualifier in an attempt to exclude computer programs from patentable subject matter entirely.<sup>135</sup>

Open source code writers fear that large corporations would be the primary beneficiaries if such patents were allowed.<sup>136</sup> They argue that small businesses and consumers will suffer

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129. *Id.* (internal quotation marks omitted).

130. Erwin Basinski, *Status of Computer-Implemented Invention Patents in Europe Now*, WORLD INTELL. PROP. REP., Aug. 2005, at 20.

131. GUELLEC & VAN POTTELSBERGHE, *supra* note 3, at 126.

132. *Id.* That this is implemented is not relevant to patentability. *Id.*

133. Basinski, *supra* note 130, at 21.

134. GUELLEC & VAN POTTELSBERGHE, *supra* note 3, at 126.

135. *Id.* at 20.

136. *Id.* at 129.

injury because of a reduction in competition and an increase in barriers to market entry in software.<sup>137</sup> Some European Parliament members even believe that there is no legal basis for the allowance of software patents and that this system only benefits big business.<sup>138</sup>

The EPLA has also been attacked because of the debate regarding software patents. Opponents of software patents believe that the EPLA is an attempt to eliminate their arguments and ensure that software is clearly patentable subject matter.<sup>139</sup>

However, there is no strong evidence in the United States that software patents have harmed small business.<sup>140</sup> Therefore, contrary to software patents opponents' fears, to allow patents of software should help small business. Small businesses, having neither market power nor the name recognition of companies like Microsoft, have no means of protection other than patents.<sup>141</sup> Although attempts to disallow software patents will likely persist, the EPO continues to issue them.<sup>142</sup>

#### *D. Business Methods*

In 1998 the U.S. Court of Appeals for the Federal Circuit upheld a challenge to a patent on a type of portfolio management.<sup>143</sup> This decision changed the long-held view that business methods were not subject to patent. Subsequent to this decision the USPTO was flooded with patent applications for business methods, as was the EPO.<sup>144</sup>

The EPO, through board decisions, also allowed patents on business methods, but unlike the United States, the EPO Board's view places additional restrictions on patentability of

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137. Opponents believe that patents will be an absolute bar to market entry. *Id.*

138. Basinski, *supra* note 130, at 21.

139. Alain Pompidou, President, European Patent Office, Address at the European Patent Office Online Servs. Annual Conference (Oct. 4, 2006), *transcript available at* <http://www.diritto.it/docs/22861>.

140. GUELLEC & VAN POTTELSBERGHE, *supra* note 3, at 129.

141. *Id.*

142. Basinski, *supra* note 130, at 21.

143. GUELLEC & VAN POTTELSBERGHE, *supra* note 3, at 130.

144. *Id.*

business methods.<sup>145</sup> Following a study of the USPTO and the JPO, the EPO stated that “[a] technical aspect is necessary for a computer-implemented business method to be eligible for patenting[,]” and “[m]erely to automate a known human transaction process using well-known automation techniques is not patentable.”<sup>146</sup>

Three types of claims can arise under business method subject matter. The first type is “abstract[ing] business methods that should be rejected on the grounds that they are . . . methods of doing business ‘as such.’”<sup>147</sup> The second type includes business methods with the use of a computer, which should be examined in the exact same way a software patent is examined.<sup>148</sup> The third type includes any other type of business method, which the EPO will likewise examine as a software patent.<sup>149</sup>

Although business methods remain patentable, there are detractors. The main question to ask in a discussion of whether business methods should be patentable is, “[a]re patents a useful addition to incentives to innovate in [the area of business methods]?”<sup>150</sup> After all, the point of a patent system is to encourage innovation. The evidence seems to support that patents have not encouraged innovation in this field.<sup>151</sup> In the past there has been a great deal of innovation in the field of business methods without the prospect of a patent reward.<sup>152</sup>

One reason why patentability would not noticeably increase innovation in this area is that the sunk cost on this type of innovation is low.<sup>153</sup> A business method is usually an idea with a minimal amount of implementation. By contrast, the sunk cost of what is commonly considered research and development is

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145. *See id.*

146. Peter Ward, *The EPO's Approach to Business Method Patents: A Study*, WORLD INTELL. PROP. REP., Nov. 2003, at 25, 25.

147. *Id.*

148. *Id.*

149. *Id.*

150. GUELLEC & VAN POTTELSBERGHE, *supra* note 3, at 130.

151. *Id.*

152. *See id.* U.S. business method patents often consist of utilizing known business methods electronically. *Id.*

153. *Id.* at 131.

normally quite substantial. Also, protection for business methods could be obtained through secrecy or trademark in this field. Patents are typically much more expensive and have a shorter duration than these other types of protection, so innovators may not choose patent protection even if it is available. Thus, patents do not significantly increase the incentive to innovate regarding business methods.<sup>154</sup>

There is also little to be gained from disclosure of patented business methods. If a product is to be marketed, disclosure will happen at that time regardless, as secrecy cannot be maintained. If a method is kept secret for a substantial amount of time, then it normally makes more sense to use trade secret protection rather than patent. These methods would not be disclosed anyway.<sup>155</sup>

Furthermore, patents may even create problems regarding business methods. “Inventing new ways of doing business is the essence of market competition: new ways of attracting customers, more efficient procedures for reducing internal costs, [and] new services.”<sup>156</sup> Though “[b]usiness innovation is the ordinary working of competitive markets; [p]atents are an exception to the competition rules.”<sup>157</sup> Allowing patents in business methods may subject all competition to unjustifiable social restrictions.<sup>158</sup>

### *E. Academic Patenting*

Academia is a relatively new player in patents.

[University] patenting activity, which [has] increased substantially since the early 1980s in the [United States] and the early 1990s in Europe, is the result of two events [, specifically,] the emergence of new technologies (especially biotechnolog[y] for which the distinction between basic and applied research is

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154. *Id.*

155. *Id.* at 132.

156. *Id.*

157. *Id.*

158. Business methods should be subject solely to the usual rules of competition.  
*Id.*

difficult to draw) and the adoption of the Bayh–Dole Act in the [United States] in 1980.<sup>159</sup>

The Bayh–Dole Act “allow[s] universities to patent the results of federally-funded research and license the resulting technology to businesses and other entities.”<sup>160</sup> This Act has greatly influenced Europe’s view on universities’ obtaining of patents. In fact, some European countries have similar legislation in force today: Germany and the United Kingdom implemented a similar law in 1998, and Belgium did in 1999.<sup>161</sup>

Conversely, however, Denmark in 2000, Germany in 2001, and Austria in 2002 revoked the “professor’s privilege.”<sup>162</sup> The professor’s privilege “means that professors-inventors [have] the right to patent their own inventions.”<sup>163</sup> Regardless of whether outside legislation plays a role, there has been a considerable increase in academic patenting recently.<sup>164</sup>

Although university filings account for a relatively low number of EPO applications, they have risen 600% since the 1980s.<sup>165</sup> Furthermore, academic patenting is highly significant in certain areas: In nanotechnology and the life sciences, universities file up to 50% of patent applications.<sup>166</sup>

Justification for academic patenting and regional governments’ support thereof find their roots in the belief that “academic patenting fosters the rate of technology transfer from the academic sector to the business sector.”<sup>167</sup> Also, academic patenting could mean potential new jobs in the management of university intellectual property.<sup>168</sup>

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159. *Id.* at 184.

160. JOINT ECONOMIC COMM., OFFICE OF THE CHAIRMAN, ENTREPRENEURIAL DYNAMISM AND THE SUCCESS OF U.S. HIGH-TECH 31 (1999).

161. GUELLEC & VAN POTTELSBERGHE, *supra* note 3, at 184–85.

162. *Id.* at 185.

163. *Id.*

164. Some local governments have funded development of offices for technology transfer. *Id.*

165. *Id.* at 186.

166. *Id.*

167. *Id.*

168. *Id.*

Several scholars have, however, expressed serious concerns regarding the arrival of universities in the patent area, based on two grounds[,] first . . . that fostering academic patents might lead to a lower “quality” of these patents [and] second . . . that the incentives created by the fostering of academic patenting might shift the academic research towards more “applied” research . . . with detrimental effect on long-term growth.<sup>169</sup>

There is no evidence that shows a negative impact on academic patent quality. Moreover, the scientific production of academics involved in patenting is often higher and of better quality when compared to that of their colleagues. Studies suggest that academics involved in patenting typically have prominent research records.<sup>170</sup> Also, “a high scientific performance in terms of [number of] publications and citations . . . increase[s] the probability of filing a patent [application, and] more productive scientists are more likely to become academic inventors, to no detriment of their orientation towards basic research.”<sup>171</sup>

In summary, few studies support the idea that academic research will suffer because of academic patenting. To the contrary, the evidence suggests that academic patents are complimentary to research. Also, patents can serve to offer more incentive for further academic research.<sup>172</sup>

A related issue is that of a potential exemption in academia for research on patented inventions. Without an exemption, conducting research on a patented invention may be considered infringement. Proponents of this exemption believe that not granting exemptions would hinder scientific research and subject academics to potential patent infringement claims.<sup>173</sup>

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169. *Id.* at 186–88.

170. *Id.* at 188.

171. *Id.* at 188–89.

172. *Id.* at 189. Murray and Stern show the sole negative research, demonstrating a 9–17% drop-off in research after the issue of a patent. *Id.*

173. *Id.* at 190.

Opponents argue that research would not be prohibited. The cost of research will simply increase.<sup>174</sup>

The CPC does allow for an academic exemption for research, but the implementation and interpretation among EPC countries is varied.<sup>175</sup> “Article 27(b) states that: ‘the rights conferred by a Community patent shall not extend to [] (b) acts done for experimental purposes relating to the subject-matter of the patented invention.’”<sup>176</sup> Also, many academics do not perform patent searches and tend to disregard potential infringement because they do not feel threatened.<sup>177</sup> They are generally correct not to fear suit. Because of the potential for poor public relations, a minimal amount of damages, and uncertainty in the law, universities are not likely to be sued for infringement.<sup>178</sup> However, “universities [are] increasingly being funded by the business sector,” which “do[es] enforce their proprietary knowledge.”<sup>179</sup> If this trend continues, or if universities file infringement suits, the debate on an academic research exemption will intensify.<sup>180</sup>

## V. THE COMMUNITY PATENT SYSTEM

The patent system is designed to improve and encourage the development of new technologies; however, currently the European Union and the EPO operate as completely separate entities.<sup>181</sup> Furthermore, the rules applied in each EPC member country are different. This makes both the patenting and enforcement processes expensive and difficult. However, the

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174. *Id.*

175. *Id.*

176. *Id.* at 190.

177. It is often difficult to determine infringement, and academics are sometimes uninformed about the consequences. *Id.* at 190–91.

178. *Id.* at 191.

179. *Id.*

180. *Id.*

181. Geertrui Van Overwalle & Jens Schovsbo, *Policy Options for the Improvement of the European Patent System*, 38 INT’L REV. INTELL. PROP. & COMPETITION L. 834, 835 (2007).

continued success of the EPO shows that Europe is open to further integration.<sup>182</sup>

Because patent enforcement is solely a national matter, the current patent system is expensive and unpredictable.<sup>183</sup> There must be further integration to improve the system.<sup>184</sup>

One reason for the CPC's repeated failure is the self-interest of several European governments. "For instance, some countries, and particularly the ones which are less inventive but have a large market, have no immediate interest in a reform which would strengthen patents," because "[l]ocal customers would have to pay a higher price for patented goods . . . , and local inventors would be submitted to a more intense foreign competition."<sup>185</sup>

This is the reason why some countries have rejected the CPC. However, this conservative approach does not further innovation. India and China do not currently produce a great deal of innovation, but they are committed to becoming much more innovative.<sup>186</sup> Because of this, they have begun the process of implementing strong patent systems, thus offering more incentives for potential innovators. In this way, they will encourage more innovation. Self-interested European countries should adopt a similar policy, thereby providing more incentives for their citizens to innovate.<sup>187</sup>

Giving European countries economic incentives to integrate would be effective as well. Because economic incentives benefit all of Europe, countries would be less likely to insist on the adoption of certain aspects of their legal system. "Putting the patent system [into] an economic dynamic would refocus the debate from legal details to the mission of the system, an area

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182. EPO rules are not necessarily implemented the same way in every country. GUELLEC & VAN POTTELSBERGHE, *supra* note 3, at 221.

183. *See id.* at 221 (describing how, in Europe, patents are national rights, which means different rights across national borders and a multiplication of filing costs).

184. *See* Pompidou, *supra* note 139 (describing the EPLA as a uniform system for patent litigation across the European Union).

185. These goods could be reproduced locally if not for patent protection. GUELLEC & VAN POTTELSBERGHE, *supra* note 3, at 221.

186. *Id.*

187. *Id.*

where different criteria apply and where different parts of the government are involved,” and “[t]here would be more likelihood that the European integration process would resume.”<sup>188</sup>

Because of the CPC’s failure, some EPO countries have attempted to achieve the same goals via the EPLA and the London Protocol.<sup>189</sup> The EPLA would set up one judicial system for patent cases throughout Europe. The London Protocol minimizes translation issues by allowing any application to be filed in French, German, or English.<sup>190</sup>

Although claims must still be translated into all three languages, France’s recent ratification of the London Protocol significantly decreases the cost of an EPO application. Every additional country that ratifies this agreement will decrease the cost further. There have been reports that Belgium and Latvia are considering ratifying the agreement.<sup>191</sup> Ratification is an important step toward the CPC and a better patent system, and it “is to be welcomed as one of the most significant developments in . . . European patents.”<sup>192</sup>

## VI. EPO WORKLOAD

Another major problem is the EPO’s workload:

The EPO has witnessed a radical surge in the size of its workload; [n]ot only [in] the total number of patent applications . . . but [in] size, as measured with the number of pages [and] number of claims per patent [which] has . . . nearly doubled since the early 1980s.<sup>193</sup>

At the EPO, patent filings have increased “from about 20,000 in the early 1980s . . . to 192,000 in 2005.”<sup>194</sup> Considering technological patents specifically, communication, information

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188. *Id.* at 222–23.

189. *Id.* at 223.

190. Morgan & Wessing, *supra* note 72, at 35.

191. *Id.*

192. Now that France has ratified the agreement, French-speaking countries are more likely to follow suit. Morgan & Wessing, *supra* note 72, at 36.

193. GUELLEC & VAN POTTELSBERGHE, *supra* note 3, at 209.

194. *Id.*

technology, and biotechnology have seen the sharpest rise in the number of patent applications recently.<sup>195</sup>

Possibly more problematic than the increase in the number of patent applications is the increase in the number of claims and pages in the average application. The average number of claims in an application is now about twenty, but it was twelve in 1990.<sup>196</sup> Pages have increased over the same time period to thirty from sixteen.<sup>197</sup> “Over the past 25 years the workload of the [EPO] has been multiplied by 20.”<sup>198</sup>

The applications that the EPO receives are also increasingly more complex.<sup>199</sup> Though this increase is, in part, because of the idea that new technology built on old technology will be more complex, it is also because of the introduction of additional subject matter to the patent system.<sup>200</sup> Computer-related inventions, biotech, and organic chemistry, for example, are increasingly more complex and typically have the most number of claims per application.<sup>201</sup>

There is no reason to expect that the EPO workload will not continue its substantial increase:

[T]hree factors that may contribute to a sharp increase in the number of patent applications are (1) the improved integration of the European market for technology through the London Protocol or the European Patent Litigation Agreement, which may improve the attractiveness of the EPO; (2) the potentially sharp increase in patent filings originating from fast developing countries (e.g., India and China); and (3) the arrival of new actors, like [university inventors].<sup>202</sup>

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195. *See id.* Investors in these fields have more incentives to patent, and thus have filed more often. *Id.* at 211.

196. *Id.* at 210 tbls.7.6 & 7.7.

197. *Id.* at tbl.7.6.

198. *Id.* at 211.

199. “The threshold for patents [is also] too low.” Van Overwalle & Schovsbo, *supra* note 181, at 836.

200. GUELLEC & VAN POTTELSBERGHE, *supra* note 3, at 211.

201. Just as electronics have become more complicated, so too have corresponding patent applications. *Id.* at 212.

202. *Id.* at 213.

Because of the extreme workload increase and backlog at the EPO, examiners have been under mounting pressure to increase productivity. However, this “can be done only by reducing the resources allocated to each application, mainly examiners’ time, with the danger of substituting quantity for quality.”<sup>203</sup> Occasionally, even applicants have noted anxiety about patent value. Moreover, as examiners began to spend less time per application, applicants began to file for inventions of a lesser quality. This served to create more difficulty for the EPO.<sup>204</sup>

There are two potential solutions to this problem. The EPO can either “relax[] standards or [reinforce] stringent examination.”<sup>205</sup> By relaxing standards, the EPO’s issued patents would be of a lesser quality and therefore of less value to the patent holder.<sup>206</sup> Most users of the EPO system feel that this would be worse than the current system.<sup>207</sup> But by reinforcing examination, patent value would increase, even though the volume of issued patents would decrease. However, this problem can be easily corrected. The standards for patentability could be raised along with application fees. This solution would cause a decrease in lower-quality applications being filed and increase the value of patents that are ultimately granted. The goal of the patent “system [should be] to produce good quality patents, and costs related to this end should be accepted.”<sup>208</sup>

## VII. CONCLUSION

In order to integrate and strengthen the European patent system, the community patent system must be adopted. An economic incentive should be used to convince self-interested countries and those who fear the English language preeminence within the system to adopt the community patent system.<sup>209</sup>

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203. *Id.* at 217.

204. *Id.* at 216–17.

205. Van Overwalle & Schovsbo, *supra* note 181, at 836 (emphasis omitted).

206. *See id.* at 836 (noting that a relaxation of standards “would lead to more, but less valuable, patents”).

207. Morgan & Wessing, *supra* note 72, at 34.

208. Van Overwalle & Schovsbo, *supra* note 181, at 837.

209. With economic incentive, countries will be less likely to ignore the common good. GUELLEC & VAN POTTELSBERGHE, *supra* note 3, at 222–23.

The first step to implement this dynamic should be to emphasize the goals of the patent system. Patents “are tools to promote welfare in society by furthering innovation.”<sup>210</sup> This fact should be made clear via the implementation of an EPC preamble. The preamble should stress economic benefit for the good of all of Europe, “guide the legislature in setting patent rules and determining what inventions should be patentable,” and “serve as a tool for the interpretation of . . . patent rules . . . by the Boards of Appeal [and] national courts.”<sup>211</sup>

The preamble should also guide the legislature’s hand with respect to which subject matter should be patentable, and to what standard, through an economic viewpoint.<sup>212</sup> For subject matter where patents would provide a significant economic incentive to innovate, patents should be allowed. They should be allowed on biotechnology and software, but not on business methods.<sup>213</sup>

The recent emergence of academic patenting has also raised much debate. However, there is no strong evidence that patent quality or academic research will suffer as a result of patentability. In fact, evidence seems to be to the contrary. Therefore, academic patenting should be allowed.<sup>214</sup>

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210. Van Overwalle & Schovsbo, *supra* note 181, at 835.

211. *Id.* The suggestion is to use the following language:

The granting of patents serves the purpose of enhancing social and economic welfare by means of encouraging inventions and their diffusion. The protection provided by patents should be sufficient to ensure proper incentives to inventors. This should imply that patents should be granted in a proportionate and transparent manner, so as to ensure legal certainty.

*Id.*

212. *Id.*

213. This is because patents are not necessary to encourage innovation in the field of business methods. See GUELLEC & VAN POTTELSBERGHE, *supra* note 3, at 63–89.

214. See *id.* at 186, 188 (discussing critics of academic patenting and answers to criticism that patent quality will decrease or academic research will suffer).

A related issue deals with an academic research exemption to patent infringement. In the interest of fostering the advancement of knowledge, this exemption should be allowed. However, it should also be limited. As universities are increasingly funded by businesses, academic research may become a loophole for businesses to do what would otherwise be infringement. This bypass of patent protection diminishes competitors' incentives to innovate and obtain a patent. It should therefore not fit into the exception. University research that is funded by business or is done generally for economic benefit of the university researcher should not be allowed in the academic research exemption. Only research done for mainly academic purposes should be allowed, lest too much patent protection be taken from competitors. Likewise, there is too much potential for corruption if the exemption were without limits.<sup>215</sup>

The final part of the problem with the European patent system is the EPO's ever-increasing workload. It would be partially solved with full integration of the European patent system which would mean the elimination of all European national patent offices. These offices and examiners could then become additional branches of the EPO, thus creating more EPO examiners and redistributing the workload.<sup>216</sup>

The rest of the overload could be solved by increasing fees, and therefore the time examiners spend on each application. More time per application means fewer low quality patents will be granted and, in turn, fewer low quality patent applications will be filed, thus serving to further relieve the EPO's workload. If further alleviation is needed, the patentability standards could also be increased, resulting in even fewer applications being filed. However, increasing patentability standards should be a last resort.<sup>217</sup>

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215. See *Madey v. Duke Univ.*, 307 F.3d 1351, 1361–62 (Fed. Cir. 2002).

216. Applications files in a country's native language could be redirected to a corresponding new EPO branch office. Cf. GUELLEC & VAN POTTELSBERGHE, *supra* note 3, at 212 (describing the existing practice of transferring applications to other patent offices).

217. *But see id.* at 213.

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Although some inventors may be discouraged by high fees and potentially higher standards, inventors should find comfort in knowing that the result of their efforts will be a high quality patent, enforceable throughout all of Europe in a court of common jurisdiction. In these ways, the European patent system can advance in quality and prestige, and become the policy tool that it is meant to be: enhancing the economics and knowledge of Europe.