

Draft Article:

## **Defending patents: a risky enterprise for the businessmen of the Industrial Revolution**

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### *Abstract*

*From the mid-eighteenth century, the Industrial Revolution was gathering momentum in England. Inventing processes of use to industry and manufacturing was becoming increasingly lucrative, but inventors often needed financial backers. The patenting of inventions offered businessmen a more secure investment opportunity. However, it was of vital importance to these businessmen that their patent would be upheld in court.*

*Patent litigation during the early phase of the Industrial Revolution was a risky enterprise for patentees. The judges of the common law courts were faced with the task of determining the patentability of inventions related to the mechanisation of processes and the use of chemical discoveries. Whether a process, as distinct from the product made, could be the subject matter of a patent was an issue which divided the judiciary. It would only be in the 1840s that businessmen could be sure that a process patent with an industrial application would be upheld in court. However, even today not all processes are patentable. The technology has changed from mechanization to digitalization but, in some respect, the risks of patent litigation for commercial inventors today are not fundamentally different from those facing the commercial inventors of the Industrial Revolution.*

### Introduction

A patent is a grant of an exclusive right to exploit an invention. Patent applications have become a regular feature of business for many companies, with some companies filing hundreds or even thousands of patent applications each year.<sup>1</sup> Patenting has become an important strategy not only for hi-tech companies, but also for a whole range of companies, for example the opening of a tetra pack is protected by patent. However, not all inventions are patentable. It can be difficult for businesses to make a reliable estimate of the patent eligibility of an invention, particularly in an era characterised by new forms of innovation. This was illustrated in more recent times by the shift to digital technology. From the 1970s, a series of patent cases relating to computer applications saw courts, both in Europe and the USA, struggling to determine when software would be patent eligible and when it would not. Various digital methods failed to procure patent protection, for example a computer program

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<sup>1</sup>Heading the list in 2010 was the Japanese Panasonic Corporation, which filed 2,154 patent applications; the Chinese telecommunications corporation ZTE Corporation came in second filing 1,863. The Dutch corporation, Koninklijke Philips Electronics also filed more than 1,000 patent applications. WIPO statistics at [www.wipo.int/pressroom/en/articles/2011/article\\_0004.html](http://www.wipo.int/pressroom/en/articles/2011/article_0004.html)

which displayed crystal structures and made the hand crafting of models unnecessary, and a procedure to convert binary digits into binary numbers.<sup>2</sup>

There was an earlier era which was also characterised by a wave of new techniques: the Industrial Revolution. England led the way. The early stirrings of industrialisation became apparent after the mid-eighteenth century in England. Production would become increasingly mechanised; that the pace of industrialisation gathered speed was due in no small part to the inventions of such men as Hargreaves, Arkwright and Watt. This surge in technical innovation was accompanied by a surge in the number of new patents. As the patenting of an invention could form a substantial investment, it was an investment which a patentee would seek to protect by bringing lawsuits against anyone found infringing the patent. However, patent law was in its infancy and patent litigation could be a risky enterprise for inventors in the early phase of the Industrial Revolution. It was particularly risky if the patent that the inventor wished to defend was for a process, rather than for a product. Whether a patent for a method would be held to be patent eligible could depend to a large degree upon the interpretation of the existing patent law by individual members of the judiciary.

## 1. The patent framework in the early Industrial Revolution

In England in the eighteenth-early nineteenth century, the patent grant was an act of the royal prerogative, as regulated by the Statute of Monopolies 1624. “Letters patent” were royal proclamations which functioned as administrative instruments for granting certain powers and privileges. These powers and privileges were diverse in nature. The crown could use letters patent to grant land, titles and offices. Patents for new inventions were, therefore, just one type of patent; the term ‘patent’ would only become specifically linked to inventions in the course of the nineteenth century. Until the late eighteenth century, patents for new inventions represented only a small minority of all the letters patent which were filed.<sup>3</sup>

To obtain a patent, the inventor submitted a petition requesting a patent to one of the Secretaries of State, which would be referred to the law officers of the crown (the principal law officer being the Attorney-General, assisted by his deputy the Solicitor-General). This was only the beginning of a time-consuming, bureaucratic process, which included the signing and countersigning of a warrant, a bill being drafted, signed and sealed, and a writ authorising the Chancellor to engross the patent on parchment and seal it. There was, however, no system of examination (as there is today). It was only rarely that an invention would be examined prior to the patent being granted. Once all the necessary fees had been paid, in the eighteenth-early nineteenth century the patent grant was usually a formality. The recipient of a patent grant for a new invention then had the sole right of “working or making” the invention for a term of fourteen years, as provided under Section VI of the Statute of Monopolies 1624.

From the 1730s onwards, the inventor was also required to register a patent specification, disclosing the nature of his invention, within a certain period after the grant of patent. Whether the patent specification had been instigated on the initiative of the patentee, as a means to protect his invention, or by the State in the name of the crown, to ensure that the invention could be made by others at the expiration of the period of patent protection, is a

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<sup>2</sup> Respectively the UK case of *Fujitsu Ltd’s Application* 1996, RPC 511 and the US case of *Gottschalk v Benson*, 409 US 63 (1972)

<sup>3</sup> Christine MacLeod, *Inventing the Industrial Revolution: the English patent system, 1660-1800* (Cambridge: 1988), p. 2

matter of scholarly debate. However, the courts made it clear in the late eighteenth century that the purpose of the specification was to provide instructions so that a skilled workman could make the invention purely from the information given in the specification. In this way, once the patent had expired, any skilled craftsman who wanted to make the patented invention would be able to do so.

The number of English patents in force would rise dramatically over the course of the Industrial Revolution. It has been calculated that in 1750 there were 102 patents in force. By the end of the eighteenth century that number had risen to 847; by the mid-1830s there were more than 2,000 patents in force and in 1850 the number had risen to 6,155.<sup>4</sup> The increasing number of patents would be reflected in the increased number of patent disputes brought before the courts. The patent actions brought before the common law courts involved either an action to annul a patent or an action for an infringement. An action to annul a patent was brought in the name of the crown by the Attorney-General against the patentee; an infringement action was brought by the patentee against the alleged infringer to prevent the piracy of his invention.

It is not possible to know with any certainty how many patent disputes were brought to court during this period. Dutton, using B. Woodcroft's 'Patents for Invention: Reference Index', draws the conclusion that in the second half of the eighteenth century, no more than twenty-two cases came before the superior courts of Westminster. He makes the following estimation: Dollond's case is the first major case, followed by four in the 1770s, nine in the 1780s, and eight in the 1790s. The new century saw an increase, with eleven between 1800 and 1810, three between 1810 and 1815, eighteen cases between 1815 and 1820, and twenty-nine in the 1820s. In the early 1830s there were thirteen, but after 1835 there was a significant increase with thirty-four cases being heard between 1835 and 1840, and 128 in the 1840s.<sup>5</sup>

Dutton rightly approaches these figures with caution, however. Making an accurate estimate of the number of patent cases in this early phase of the Industrial Revolution is difficult. The reporting of cases was not consistent, particularly in the eighteenth century, and there are few reported cases before 1800. Dollond's case illustrates the point. Dollond's achromatic lens patent was dated 1758, but the first lawsuits were brought by Peter Dollond, the son of the patentee. Sorrenson's research has revealed that Peter Dollond brought an action against Francis Watkin and his new partner Addison Smith in the Court of King's Bench in 1763 and another action in 1764. These were the first of twelve actions Dollond would bring against various opticians.<sup>6</sup> None of the cases appears in a series of reports. Some cases, like Dollond's, are known primarily because they were cited in reported cases. That the number of reported patent cases increased can, however, be safely said. This increase is immediately apparent from the division of the volumes in Hayward's collection of patent cases. Hayward's first volume of patent cases covers the period 1600 to 1828; the second volume is already restricted to the seven years between 1829 and 1836, and volume three to only the four years between 1837 and 1841.<sup>7</sup>

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<sup>4</sup> B. R. Mitchell and P. Deane, *Abstract of British Historical Statistics* (1962), pp. 268-9

<sup>5</sup> H.I. Dutton, *The patent system and inventive activity during the industrial revolution 1750-1852* (Manchester: 1984), p. 71

<sup>6</sup> Richard Sorrenson, "Dollond & Son's Pursuit of Achromaticity 1758-1789," *History of Science* xxxix (2001), p. 40

<sup>7</sup> Peter Hayward, *Hayward's Patent Cases 1600-1883* (Abingdon, Oxon: 1987)

## 2. The patent as a business venture

MacLeod distinguishes three broad categories of patentees during this early phase of the Industrial Revolution: the amateur inventor, the professional inventor and the businessman. Commercial inventors, in particular businessmen, came to dominate the patent system from 1760 onward. These businessmen inventors were artisans, manufacturers, millwrights or machine-makers interested mainly in patents which related to their own branch of business. They might devise an invention themselves or purchase an invention relevant to their business (a patent could have been assigned to one particular manufacturer).<sup>8</sup>

Inventors often worked in association with entrepreneurs, as the development of an invention could necessitate a substantial investment. Patentees' applications to parliament for an extension of their patents, and later to the Privy Council when it took over this task from parliament, give some indication of the expenses that could be incurred in the commercial development of an invention at this time. For example, in Joseph's Bramah's petition, to extend his 1784 patent for a lock, he states that the numerous machines and apparatus necessary for the production of locks and keys entailed such a capital outlay that he had not been able to realize a profit equal to 5%. He added: "Indeed so costly are the machines erected for making the locks, that no individual with a small capital could possibly undertake the business."<sup>9</sup> Richard Arkwright entered into several partnerships to finance his spinning machinery. In requesting parliament to grant him an extension of his patent, he pointed out that: "He has induced men of property to engage with him to a large amount."<sup>10</sup> James Watt too had a succession of investors to finance the development of his steam engine: John Craig, John Roebuck and finally the successful Birmingham manufacturer, Matthew Boulton.

A patent could be a highly lucrative investment. An early example of the profits that could be made is that of Dollond's achromatic lens patent. It would appear that in 1765 Peter Dollond's profit margin was at least 200%, giving Dollond a minimum annual profit of £800.<sup>11</sup> That a patent could be a valuable investment was pointed out by Moses Poole, who was a clerk in the patent office, in his testimony to the parliamentary Select Committee on Patents in 1829: "I have known them to get £130,000 by a patent".<sup>12</sup>

### 2.1 Opposition from industrialists

A patentee whose patent stood in the way of the business of major industrialists could expect resistance to his patent. The challenge to the patent from these industrialists could take the form of an infringement of the patent by the manufacturer or an attempt by the manufacturer to persuade the crown to bring an action to annul the patent and thereby have the patent formally pronounced void.

In cases of infringement, the alleged infringer may have been acting as an individual or, in practice, acting as a representative of a consortium. That the infringement was a strategy endorsed by a consortium is indicated in various cases. If the infringement was ignored by the patentee, he took the risk that others would similarly invade his patent. Taking up the

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<sup>8</sup> MacLeod, *Inventing the Industrial Revolution: the English patent system, 1660-1800*, p. 78-79

<sup>9</sup> Joseph Bramah, "The petition and case of Joseph Bramah, of Piccadilly, engineer, inventor of the patent locks for the security of life and property" (London: 1798), p. 5

<sup>10</sup> Richard Arkwright, *The Trial of a Cause instituted by Richard Pepper Arden, Esq.*, p. 102

<sup>11</sup> Sorrenson, "Dollond & Son's Pursuit of Achromaticity 1758-1789," fn 31 and 32, p. 52-53.

<sup>12</sup> *Select Committee Report 1829*, p. 86

challenge would force the patentee to bring a lawsuit to defend the validity of his patent. The hearing would act as a test case for all the other interested manufacturers. It was a case that the patentee might lose.

In the case of James Watt's patent, there was strong opposition from mine proprietors, particularly in Cornwall. The proprietors of the Cornish mines did not want to pay Boulton and Watt's premium for the steam engine. In 1780, a movement was started to petition parliament to repeal the Act of Parliament that had extended Watt's patent beyond the fourteen years allowed under the Statute of Monopolies. In 1795 Boulton and Watt responded to this opposition to their monopoly by bringing an action against Edward Bull for infringing their patent. There are indications that Bull was actually being supported by mine proprietors in his lawsuit against Boulton and Watt.<sup>13</sup> Eyre, C.J. referred in *Boulton and Watt v Bull* 1795 to the magnitude of the interest involved, in particular to the mining industry. So vital had the engine become that "our mines cannot be worked without them."<sup>14</sup> Watt himself considered several of the judges hearing the case of *Boulton and Watt v Bull* to be under the influence of the mining proprietors and, therefore, biased against them: "Justice Buller and Justice Heath against us (Cornwall and Devonshire own these gentlemen)."<sup>15</sup> In this context it is interesting to note that Boulton was apparently quite prepared to try to influence the court himself. Boulton had dined with a judge shortly before a crucial hearing on Watt's patent.<sup>16</sup>

Patentees whose patents related to the textile industry could also be faced with powerful opponents. One example is the case of *Hall v Boot* 1822. Hall's patent was for a means of singeing lace called gassed lace. It was upheld despite the best efforts of the lace-making industry.<sup>17</sup> Some years later, James Kay would also face opposition from textile manufacturers, in his case to his 1825 patent for the process of wet-spinning of flax. Initially, one firm in particular, Marshall and Co, refused to pay for Kay's invention. Marshall campaigned actively in Leeds to encourage the other manufacturers to resist the patent. They appear to have entered into a bond to contribute towards any expenses arising from legal actions and to prevent private contracts with Kay. Marshall's persistence, together with the weight of the trade, brought down an invention which had made the boom in the early 1830s possible.<sup>18</sup> The strength of the opposition was recognised by counsel for James Kay, the plaintiff in this lawsuit. He described the defendants "of whom Mr. Marshall is at the head, are probably by name well known in this great county as a house of most extensive business, and as persons of the greatest wealth embarked in the commerce of this country." The plaintiff's counsel pointed out how much was at stake: the patent had nearly expired but "such is the importance of it, such is the value of it, that even at this late period the defendants have thought it worth their while to invade the patent."<sup>19</sup> Kay's patent was set aside by the House of Lords in 1841.

An alternative strategy for those opposed to the patent was to persuade the Attorney-General, as the crown's representative, that the patent had been wrongfully obtained by the

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<sup>13</sup> Cornish Record Office, volume 11, document AD 1583/11/102

<sup>14</sup> *Boulton and Watt v Bull* 1795, 2 H. Black 495

<sup>15</sup> Eric Robinson and Douglas McKie, eds., *Partners in Science: James Watt & Joseph Black* (London: 1970). Letter 155, p. 217

<sup>16</sup> John Hewish, "From Cromford to Chancery Lane: New Light on the Arkwright Patent Trials," *Technology and Culture* 28 (1987), p. 86

<sup>17</sup> *Hall v Boot* 1822, 1 WPC 103, Webster's editorial note.

<sup>18</sup> Dutton, *The patent system and inventive activity during the industrial revolution 1750-1852*, pp. 189-192

<sup>19</sup> *Kay v Marshall* 1836, 2 WPC 49

patentee from the crown and that the State should, therefore, initiate an action in the name of the crown to revoke the patent (by a writ of *scire facias*). Collusive action by manufacturers to have patents set aside by the crown clearly prompted a number of such cases. In Arkwright's case, an association of cotton manufacturers wished the crown to act against Arkwright's second patent. Hewish has discovered evidence of the unconventional way in which the crown's action against Arkwright (*R v Arkwright* 1785) was commenced, "perhaps indicative of influence at high level". There is fairly conclusive evidence that the crown case to repeal Arkwright's second patent was already underway before the verdict in Arkwright's own civil action for infringement against a certain Mr Nightingale was known (*Arkwright v Nightingale* 1785). Arkwright's counsel referred to "those behind the scenes, the movers and conductors of this business."<sup>20</sup> Arkwright too had referred to this association in a document dated 1782 (Arkwright's petition to parliament for an extension of the duration of his patent), which was read out in evidence in *R v Arkwright*:

"Without the assistance of Parliament, the late verdict threatens him with the most serious consequences; and truly alarming is the *association* against him, being formed of men of property, anxiously desirous of overbearing him at all events."<sup>21</sup>

Arkwright lost the action brought by the crown and his second patent was set aside.

In *R v Arkwright* 1785, the trial judge, Justice Buller, made a comment about the use of this writ of *scire facias*: that although the writ had been used often in former times, the proceeding by *scire facias* to repeal a patent "is somewhat new in our days; none such has occurred within my memory."<sup>22</sup> However, later that same year, Buller would preside over another *scire facias* patent case, *R v Else* 1785, which was a trial of major interest to the country's lace manufacturers. More cases for annulment would follow, for example *R v Boileau* 1799, *R v Cutler* 1816, *R v Metcalf* 1817, *R v Hadden* 1826, *R v Fussell* 1826, *R v Daniell* 1827. The crown had a remarkable success rate: in all these cases, the verdict was for the crown and the patent was declared void.

## 2.2 The strategy of the patentee

If industrialists were prepared to wage war on patentees via the courts, so too were many of the patentees and their financial backers prepared to hit back via the courts. Dollond's case appears to be the first major patent case heard by the common law courts after the Privy Council ceded its jurisdiction in patent validity cases in the early 1750s. John Dollond had been granted a patent in 1758 for making achromatic lenses. His son, Peter Dollond, brought twelve legal actions against seven different opticians for the infringement of the patent granted to his father. He won them all.

Boulton and Watt were also willing to use the same tactics as those manufacturers who wished to see the end of patents that stood in their way: to persuade the Attorney-General to bring an action in the name of the crown to annul the offending patent. The case of *R v Murray* 1803 was instigated by Boulton and Watt. It was an action brought by the crown to revoke Murray's patent, which had been granted in 1801, for an air pump for steam engines.

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<sup>20</sup> Hewish, "From Cromford to Chancery Lane: New Light on the Arkwright Patent Trials," pp. 82-3, 85-6

<sup>21</sup> Arkwright, *The Trial of a Cause instituted by Richard Pepper Arden, Esq.*, p. 102

<sup>22</sup> *Ibid.* p. 172

Apparently, so intimidating was this combination against him that the day before the trial was due to be heard, Murray withdrew his plea and his patent was cancelled.<sup>23</sup>

Nuvolari argues that Boulton and Watt actually used the courts as a weapon to scare off any real competition. The most serious competing design to Watt's steam engine was that of Jonathan Hornblower. Jonathan Hornblower took out a patent in 1781 for a new pumping steam engine. Boulton and Watt's strategy for dealing with the threat of Jonathan Hornblower was to start a campaign of legal actions against those who were clearly infringing their patent. The first action was against Edward Bull. Bull's engine was essentially a simplified version of Watt's engine. The second was against Jonathan Hornblower's brother, Jabez Hornblower, and Maberley. Successful in both cases, the point had been made to the infringers. There would be no further courtroom clash between Boulton and Watt and Jonathan Hornblower.<sup>24</sup>

If Nuvolari is right to attribute to Boulton and Watt a premeditated strategy of court actions, this would presume that Boulton and Watt were reasonably confident of success. However, these proceedings were far more risky than Nuvolari seems to have taken into account. It may well be the case that Bull's engine, from the technical perspective, was quite obviously an infringement of Watt's engine. Yet that would only be relevant if Watt's own patent was held by the court to be a valid patent. That was indeed the issue raised by Bull. The possibility was always there that Watt's patent would be set aside because of *legal* defects: that the specification was insufficient to instruct one skilled in the profession; it was claiming the steam engine as such whereas it should only have claimed an improvement to a previous steam engine; the patent was only for a principle and a scientific principle could not be patented. Indeed, not all of the judges found in favour of Boulton and Watt in Bull's case. Heath, J. considered that as the patent extended to all machinery build on the same principle, Watt had taken out a patent for more than he had specified and Buller, J. argued that Watt was claiming the whole machine rather than an improvement to the steam engine.<sup>25</sup> The perils of patent litigation for inventors and their financial backers should not be underestimated. By the end of the eighteenth century, the legal concepts of patent law were still in a process of development. The bounds of patentability were by no means always crystal clear, as the courts struggled to find a legal framework to deal with inventions of an increasingly technical nature.

### 3. The role of the judiciary in defining patent eligibility in the Industrial Revolution

As there was no system of searching for prior art in the eighteenth-early nineteenth century, and it was only rarely that a patent application was subject to any examination before the patent was granted, the first real testing of the validity of a patent was in the courts. If the court held that there was no infringement because the patent was not valid, then even in the absence of a formal revocation by the crown, the patent was in effect annulled. Bringing a case for infringement to court could, therefore, have a disastrous consequence for the patentee. By the late eighteenth century, it was becoming a dictum that a patent was of little commercial value until it had been successfully defended in the courts.<sup>26</sup> A successful action not only deterred infringers, it often increased the profits that could be made from the invention. For

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<sup>23</sup> R v Murray 1803, 1 HPC 522/3 RA 235-6

<sup>24</sup> Alessandro Nuvolari, *The Making of Steam Power Technology: a Study of Technical Change during the British Industrial Revolution* (Eindhoven: 2004), pp. 29-30, 102-3

<sup>25</sup> Boulton and Watt v Bull 1795, 2 H. Black 483, 489-90

<sup>26</sup> MacLeod, *Inventing the Industrial Revolution: the English patent system, 1660-1800*, p. 73

example, Peter Dollond substantially raised the price of his lenses once his achromatic lens patent had been upheld in court.<sup>27</sup>

However, it could be difficult for patentees to evaluate their chances of success in the courtroom. By the mid-eighteenth century, there had been too few patent disputes in the period since the Statute of Monopolies 1624 for a substantial body of case law to have been built up. The common law courts had heard several patent cases in the seventeenth century, but thereafter their role seems to have been minimal. Until the mid-eighteenth century, patent validity cases had also fallen under the jurisdiction of the Privy Council. The Privy Council had jurisdiction in this matter because a patent at this time was an act of the royal prerogative and the powers exercised by the Privy Council were the powers which the crown could exercise under the royal prerogative. Despite the fact that the Statute of Monopolies had stated that all monopolies should be “hereafter examined, heard, tried and determined by and according to the *common laws of this realm, and not otherwise*”, a stipulation that such cases should be heard by the common law courts, it was the Privy Council which had become the main forum for hearing patent disputes, not the common law courts.

When the common law courts did become the primary forum in the 1750s, (the Privy Council having relinquished its jurisdiction in patent validity cases<sup>28</sup>), there was hardly any patent law to help the judges. With respect to legislation, all they had was the Statute of Monopolies 1624 which was already more than a hundred years old. The Statute had been drafted in response to the concerns of an earlier era when whole industries, rather than specific techniques, had been the subject of patent protection. Inventions had become more technical since the early seventeenth century.<sup>29</sup> As for case law, there were only a few old cases. Hulme notes that, “the common law judges were left to pick up the threads of the principles of law without the aid of recent and reliable precedents”.<sup>30</sup>

With no well-established legal framework in place, as was the case with older, more familiar areas of law, members of the judiciary could not fall back on years of accepted practice. Consequently, this left the development of patent law very largely in the hands of the judges. Without recourse to a settled body of received wisdom, judges’ decisions would be more individualistic. Decisions in patent cases would be more susceptible to the preference of an individual judge for a particular mode of interpretation, filtered through the judge’s own frame of reference. Judicial decisions were, therefore, often experienced by patentees as inconsistent with each other and out of step with the needs of an increasingly industrial society.

### 3.1 The interpretative function of judges

To what extent did these judges make patent law rather than simply interpret it? Judicial decision-making is always to some degree a creative act. The very selection of which facts are

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<sup>27</sup> Sorrenson, “Dollond & Son's Pursuit of Achromaticity 1758-1789,” fn 31 and 32, p. 52-53.

<sup>28</sup> Whether the Privy Council ceded its jurisdiction in patent validity cases to the common law courts because of constitutional considerations or whether the increasing number and complexity of patent applications meant that the transfer was the practical option is a matter of scholarly debate.

<sup>29</sup> Dirk van Zijl Smit, *The Social Creation of a Legal Reality: A Study of the Emergence and Acceptance of the British Patent System as a Legal Instrument for the Control of New Technology* (PhD thesis, Edinburgh University: 1981), p. 90

<sup>30</sup> E. Hulme, “On the Consideration of the Patent Grant Past and Present,” *Law Quarterly Review* 13 (1897), p. 318



relevant and which are not is in itself a creative act. The famous American judge Oliver Wendell Holmes argued that judicial decision-making was not simply a logical exercise in which an established rule of law was applied to the facts of a particular case: "... the life of the law has not been logic, it has been experience."<sup>31</sup> He dismissed the idea that the law could be dealt with as if it contained only the axioms and corollaries of a book of mathematics.

On the other hand, it has been argued that to maintain that judges are free to create law arbitrarily is a step too far. C.K. Allen acknowledges that judges in "a derivative or secondary sense" make law, but only in this sense. Theirs is not an original act of creation. Every act of interpretation shapes something new, in a secondary sense. A judge cannot, however much he may wish to do so, sweep away what he believes to be the prevailing rule of law and substitute something else in its place. "In this sense it is no 'childish fiction' to say that he does not and cannot 'make' law."<sup>32</sup> Allen's approach is similar, in this respect, to that of the Dutch civil law scholar, Paul Scholten. Scholten too argued that the function of the judge is essentially a creative one, but it is restricted by the given legal order. Scholten saw that legal order as embedded within society. Every law is based upon an appreciation of social interests, and is aimed at exerting an influence on what happens in that social reality. As society is constantly changing, so legal regulations may come to cover areas for which they were not intended. There is continuity in the law, but it changes every day by its application.<sup>33</sup>

Judges have very different ideas about their interpretative function. Within the judiciary a split is discernable between those judges who conceive of their role in formalist terms and those judges who adopt a purposive approach. The formalist style favours a more black letter approach to the interpretation of legal instruments, whereas the purposive style places the interpretation of legal instruments within a social context, allowing judicial interpretation to adapt the law to the perceived needs and circumstances of the day. As Allen points out: "some judges will always play safe and some will be astute to mitigate the *rigor juris* in accordance with common sense, justice and social requirements".<sup>34</sup>

The internal divisions always present within the judiciary, but in general less conspicuous in the decision-making in more established areas of law, would surface openly in the development of patent law. Whereas some judges considered that their role was to abide by the strict letter of what they deemed to be the existing patent law, others preferred to interpret that law according to what they considered to be the spirit or purpose of the law. The factors taken into consideration in interpreting patent law would vary depending upon the nature of the approach adopted by the judge. In a predominantly formalistic approach, the emphasis would be on such matters as grammar, word formulation or the historical context of the Statute of Monopolies. In a purposive approach, the emphasis would be more on the aim of the Statute, interpreting that law within a contemporary social context.

### 3.2 The effect on patent law of different judicial interpretational styles

After the enactment of the Statute of Monopolies in 1624, it was clear that an inventor could only protect his invention from piracy by patent. As a patent granted a monopoly, a patent

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<sup>31</sup> Oliver Wendell Holmes, *The Common Law* (Chicago: 1881/2000), p. 1

<sup>32</sup> C.K. Allen, *Law in the Making*, 7th ed. (Oxford: 1978), p. 308-309

<sup>33</sup> Paul Scholten, *Asser's Handleiding tot de Beoefening van het Nederlands Burgerlijk Recht: Algemeen Deel* (Zwolle: 1974), p. 34-35

<sup>34</sup> Allen, *Law in the Making*, p. 345

would only be valid if it was granted according to the conditions set out in the Statute of Monopolies. Section VI of the Statute stated that a patent monopoly could be given to:

- the first and true inventor of
- a new manufacture
- if the invention was not harmful to the State or generally inconvenient.

Whether the word ‘manufacture’ would be interpreted by judges to include a process, as well as a physical product, would be strongly affected by a judge’s own individual interpretational style.

Patent applications were dealt with by the law officers of the crown. If the report of the law officer was favourable, the patent would be granted and the specification enrolled. The report was a formality. There are indications that the system was administered by the law officers in the most cursory way.<sup>35</sup> Many patents were granted by the law officers for inventions that were processes: the patented invention was a method of use to industry or manufacturing. One of the major points of discussion in the case of *Boulton and Watt v Bull* was the fact that Watt had described his invention in his patent specification as a “method of lessening the consumption of steam and consequently fuel in fire engines”.<sup>36</sup> Although the judiciary was unanimous in its conclusion that a scientific principle could not be patented, it was clear from the discussions in *Boulton and Watt v Bull* that there was disagreement on the bench as to whether a method (making use of a scientific principle) could be patented. Did the law recognise such a thing as a process patent? Could there be patent protection for a method itself, as something separate from the thing so produced, or was patent protection restricted to the material product that resulted from a process?

Some judges were prepared to recognise the fact that patents for processes were regularly granted and considered that no purpose would be served by the courts pronouncing these patents to be void. Furthermore, these methods were clearly of great value to the development of industry and trade. They considered that the term ‘manufacture’ should, therefore, be interpreted as encompassing a method. Lord Chief Justice Eyre, who found in favour of Boulton and Watt in *Boulton and Watt v Bull*, pointed out in that case:

“we may not shake the foundation upon which these patents stand. Probably I do not overrate it, when I state that two thirds, I believe I might say three fourths of all patents granted since the statute passed, are for *methods* of *operating* and of manufacturing, producing no new substances and employing no new machinery.”<sup>37</sup>

Eyre was aware of patents for new methods, where “the sole merit and the only effect produced was the saving of time and expense, which lowered the price of the article and therefore introduced it into more general use”. “Now I think these methods may be said to be new manufactures, in one of the common acceptations of the word, as we speak of manufactory of glass or any other thing of that kind.”<sup>38</sup> This line of argument was rejected by the other judges in *Boulton and Watt v Bull*. Justice Buller, who found against Boulton and Watt, rejected the patentability of a method:

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<sup>35</sup> Adams and Averley, "The Patent Specification: The Role of *Liardet v Johnson*", p. 160

<sup>36</sup> *Boulton and Watt v Bull* 1795, 2 H. Black 463

<sup>37</sup> *Ibid.* 494-5

<sup>38</sup> *Ibid.* 494

“I think it is impossible to support a patent for a method only, without having carried it into effect and produced some new substance.” “When the thing is done or produced, then it becomes the manufacture which is the proper subject of a patent.”<sup>39</sup>

Like Justice Heath, Justice Buller considered that mechanical and chemical discoveries could only be described as manufactures if the patent was for a new, physical article so produced.

For years after this case, the legal position was uncertain. Collier, who wrote the first ever legal treatise on patent law in 1803, asserted: “A patent cannot be granted for a method or principle, its object must be some substantial thing produced.” Although Collier did go on to note: “It is now completely decided in Westminster Hall [the courts of law], that if a patentee denominate his discovery a method, when in fact the thing invented is something substantial, the verbal inaccuracy shall not vitiate the grant.”<sup>40</sup> Richard Godson, writing some twenty years later than Collier, was less emphatic with respect to the status of a method: “that a mere method of making a thing, or a process, or a manner of operating, cannot be the subject of a patent, is not quite so clear. Much discussion has taken place on this rule”. Godson, like Collier, was convinced that the simple use of the term ‘method’ would not itself invalidate a patent if the specification was actually describing some tangible matter. Nonetheless, he doubted that a method without a corporeal dimension was sufficient for a patent:

“It is conceived that such a device, method, or process, cannot be a manufacture within the meaning of the statute of James [the Statute of Monopolies], because it is destitute of one of the qualities absolutely necessary to be found in a new manufacture, or subject proper for a patent – materiality. The description given by that very learned judge, Eyre, C.J. is not of any thing that can be made. There is nothing corporeal, - nothing tangible - nothing that can be bought or sold; no instrument by which the supposed benefit is produced, and which might, as an article of trade, be purchased and used by another person.”<sup>41</sup>

During the course of the nineteenth century, what was understood to constitute a ‘manufacture’ would change. The dominant judicial opinion in the late eighteenth century had been that the term ‘manufacture’ required the subject matter of the patent to be a material thing, such as a new substance or a machine. A method as such could not be the subject matter of a patent. However, Eyre was not the only judge who was prepared to endorse a method as a suitable subject matter of a patent.<sup>42</sup> Some judges sidestepped the issue by holding a process patent to be valid if it included a material component: instruments that had been built to put the method into effect could be seen as the ‘manufacture’, even though these instruments were only relevant to the process.<sup>43</sup>

In the 1820s and 30s, various cases established that there could be a patent for a new combination of well-known materials. Examples are Hall’s patent for singeing off superfluous fibres of lace, Russell’s patent for a process of welding tubes (in this case without using a known implement, the mandrel), Derosne’s patent for refining sugar and Cornish and Sievier’s patent for a new combination of known materials to make an elastic cloth.<sup>44</sup> A change in a process which enabled a product to be made more efficiently or more economically had been

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<sup>39</sup> Ibid. 485-7

<sup>40</sup> John Dyer Collier, *An Essay on Patents for new Inventions* (London: 1803), p. 75, 130

<sup>41</sup> Richard Godson, *A practical Treatise on the Law of Patents for Inventions and of Copyright* (London: 1823) pp. 82-4, 88

<sup>42</sup> See Lord Eldon in *Hill v Thompson* 1817, 1 WPC 237

<sup>43</sup> Abbott LCJ in *R v Wheeler* 1819, 106 ER 395

<sup>44</sup> These cases were summed up by Tindal, L.C.J in *Crane v Price* 1842, 1 WPC 409-10

implicitly accepted by these judges as constituting the ‘manufacture’. A method as a subject matter of a patent was endorsed by Tindal, L.C.J. in *Crane v Price* 1842 and this case has been seen as finally settling the law on this point. In 1849, Thomas Webster (whose compilation of patent cases became a standard work) considered “that the law has from the number of fresh cases latterly become a good deal more settled...I think that the principles of the law are pretty well settled now.”<sup>45</sup>

#### 4. Patentability: a recurring issue

However, the issue of what can and what cannot be protected by patent is one that does not seem to go away. In the Industrial Revolution there were courtroom discussions on whether a process could be the subject of a patent at all. That a process can, in principle, be the proper subject matter of a patent is no longer in dispute. Nevertheless, it is still the case today that not all process patents will be upheld as patent eligible.

The issue of patentability in English law is now governed by the Patent Act 1977, these provisions being based on the European Patent Convention (EPC). Any invention that is new, involves an inventive step and is capable of industrial application can be patented, unless it falls within an excluded category.<sup>46</sup> Certain methods were explicitly excluded. These include: a mathematical method, a method for performing a mental act, playing a game or doing business, or a program for a computer. A very wide provision for patentability, which included processes, appeared at an early stage in the legislation of the USA:

“Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.”<sup>47</sup>

Business methods, unlike in England, have not been explicitly excluded by statute in the US. Nonetheless, as in England, not all processes are patentable. US Supreme Court decisions have imposed certain restrictions on patentability: laws of nature, physical phenomena and abstract ideas have been held not to be patent eligible.<sup>48</sup>

On both sides of the Atlantic the issue of patentability came very much to the fore in more recent times with respect to software-related inventions. Just as the judges during the early Industrial Revolution had little case law to guide them on the patentability of methods used in newly industrialised areas of production, so had the judges of the early digital age little to assist them in determining the patentability of software-related inventions. The UK Patent Act (in line with the EPC) did leave a window open for computer programmers to have their invention patented: only a computer program “as such” was excluded from patentability.<sup>49</sup> But what was the definition of a computer program “as such”? Court decisions referred to the requirement of a further “technical effect”.<sup>50</sup> But what kind of further “technical effect” would

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<sup>45</sup> In 1849 *Report of the Committee Appointed by the Lords of the Treasure on the Signet and Privy Seal Office* 34 (Q. 720)

<sup>46</sup> Patent Act 1977, Section 1(1)

<sup>47</sup> Section 101, 35 USC

<sup>48</sup> *Diamond v Chakrabarty* (1980), 100 S. Ct. 2204 at 309

<sup>49</sup> Patent Act 1977, section 1(2)

<sup>50</sup> For example, in *Gale’s Application* 1991, RPC 305, which was a method of calculating square root numbers using a computer. It was held this was essentially a computer program, despite the fact it was incorporated in the

be required before the software was patentable remained debateable. The issue has caused considerable confusion, with businesses still not always being able to be sure whether their software falls within the realms of patent protection under English law or not.

In the USA, the courts heard a series of cases on computer software in the 1970s and 80s. If software was seen as a process of computation using mathematical algorithms, it was close to patenting an idea and the courts had determined that abstract ideas were not patentable.<sup>51</sup> *In Re Walter* 1980, the court held that “a principle of nature or a scientific truth (including any mathematical algorithm which expresses such a principle or truth) is not the kind of discovery or invention which the patent laws were designed to protect.”<sup>52</sup> The Supreme Court held that a process using digital technology that transformed an article into a different state was, on the other hand, patent eligible. It was a type of industrial process that could be protected.<sup>53</sup> The recent case of *Bilski v Kappos*, in which the claim at issue was for a business method, exposed major divisions within the US judiciary concerning patent eligibility. In the US Court of Appeals for the Federal Circuit hearing of the case, the court concluded that the test of patent eligibility for a process was whether it was tied to a machine or transformed a particular article into a different state or thing.<sup>54</sup> On appeal, the US Supreme Court in 2010 rejected the Court of Appeals’ machine or transformation test as the sole test of patent eligibility.<sup>55</sup>

## Conclusion

By the 1840s, it had become accepted by the English courts that a patent could be granted for a process itself: patent protection was not restricted to an invention in the form of a material, tangible product. Nonetheless, certain reservations concerning the patentability of processes have remained embedded in the law, as not all processes are considered to be patent eligible. In more recent times, the question of patent eligibility emerged with respect to software regulated processes.

What became very apparent in the Industrial Revolution was that the interaction between two very different communities – the legal community and the technical, scientific community – was not always smooth. Their languages were different. The patentees brought to their patent titles and specifications a language based upon the concepts of physical science: they spoke of principles and methods and processes. The concern of the judges was whether the subject matter of the patent conformed to the legal requirement of being a ‘manufacture’ under the Statute of Monopolies. Whether a process as a subject of a patent conformed to that legal requirement was for years a matter of legal debate in the English courts. Most judges at first rejected the notion of a process, as distinct from a material thing so produced, as being patent eligible; a few judges openly accepted the notion and other compromised by regarding instruments made to carry out the process as satisfying the term ‘manufacture’. How the term ‘manufacture’ would be construed by the courts was of vital concern to those businessmen

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hardware; Fujitsu Ltd’s Application 1996, RPC 511, which was for a computer programmed to represent crystal structures, confirmed the need for a technical contribution.

<sup>51</sup> *Gottschalk v Benson* 1972, 409 U.S. 63 at 71-2

<sup>52</sup> *In re Walter* 1980, 618 F.2d at 765

<sup>53</sup> *Diamond v Diehr* 1981, 450 U.S. at 184-5

<sup>54</sup> *Bilski v Kappos*, 545 F.3d, at 954

<sup>55</sup> *Bilski v Kappos*, 130 S.Ct. 3218

who had invested in the patenting of the invention at question. If the patent failed in court, their investment was lost.

During the early phase of the Industrial Revolution, whether the invention at issue fell within the meaning of the term 'manufacture' in the Statute of Monopolies could depend upon an individual judge's interpretational style. Those who adopted a purposive approach to the Statute were more prepared to see a process as a manufacture. The split within the judiciary concerning whether a formalist or a purposive approach is adopted in interpreting patent law is as much a factor today as it was in the Industrial Revolution. In more recent times, differences in approach have affected whether English judges saw a computer program as more than a computer program "as such", or whether American judges saw a computer program purely in terms of its mathematical algorithms, and hence patent ineligible as an attempt to patent abstract ideas or principles.

The *Bilski* case heard in the US federal courts provides a good, modern illustration of how the split between formalistic and purposive styles of interpretation within the judiciary can impact upon patent law. In the Federal Circuit hearing of the case, Judge Dyk wrote a separate concurring opinion, in which he considered *Bilski's* claim within a historical context, arguing that the claim was not consistent with the types of claims historically recognised by the patent system, and would not have been a manufacture under the old English Statute of Monopolies 1624. Judge Newman disagreed with the majority reasoning, arguing that earlier US Supreme Court decisions had made it clear that the law should not freeze process patents to old technologies.<sup>56</sup>

The technology has changed but the discussions taking place on patent eligibility during the Industrial Revolution show some remarkable similarities to those taking place today. A new wave of innovation heralds a period of transition, in which new ways of working have to become integrated: in the Industrial Revolution it was the mechanisation of processes; in the Information Age the digitalization of processes. In each period of transition, legal uncertainty has ensued. In that period of uncertainty, it can be very difficult for businesses to estimate the probability of successfully defending a patent action. In this transitional stage, in which legal concepts have not fully crystallised, there is an increased risk that the money they have invested in research and development will lead to unsuccessful patent applications. Disputed applications may result in costly litigation, not all of which will be resolved in favour of the patent applicant.

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<sup>56</sup> 545 F.3d at 966-976, 997

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