



ISMA

Patenting Finance: Financing Patents

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This report has been commissioned by ISMA to provide an overview of the current trends and possible future developments regarding the impact of intellectual property rights on financial services and other areas of business. All opinions expressed herein represent the personal opinions of the author and do not represent the opinion of ISMA, which has not taken an official position on the matters discussed herein.

EXECUTIVE SUMMARY

The boundaries of patentability are being extended in three directions, all of which affect financial firms or their clients. First, since 1998, 'business methods' have been patentable in the United States. Patents that have been granted there include methods for managing mutual fund structures, collateral management and monitoring the value of an index-linked bond, none of which are obviously novel. This, in part, is because - given that they had been viewed as not patentable - the records held by patent offices of previously-used business methods are often very limited. Firms outside the US need to consider whether any of their business activities might be affected by the business method patents that have so far been approved in the States.

Second, moves are afoot to permit patenting of software. The European Commission recently published a consultation document seeking opinions on whether or not software could be patented. ISMA member firms spend substantial amounts on software and may have differing views on whether or not patent protection should be extended in this way. But in any case, given that the Commission is about to draft a directive on the subject, firms may find it helpful to form a view as to whether or not to support such patentability.

The arguments over these two issues have been extensive. Indeed, the November 2000 diplomatic conference, held in Munich with the purpose of updating the European Patent Convention, delayed a decision on whether to permit patents on business methods and software. Instead, the present arrange-

ments have been left in place and these issues have been left for a separate conference, likely to be called later in 2001. Therefore policy in both these areas is currently open for discussion, presenting ISMA members with an opportunity to influence the debate if they so wish.

The third area in which patentability is being extended, amidst heated controversy, is the patentability of human genes and genes in general. This paper briefly reviews the background to this issue and concludes that laboratory-isolated DNA sequences which express genes are likely to be patentable (as distinct from genes in raw nature, which are not). This view is reinforced by the EU biotechnology directive. Because of the crucial importance of patents to assessing the value of technology firms, particularly biotechnology firms, this paper also features an overview of patent valuation methods.

CHAPTER 1

INTRODUCTION

This paper looks at the changing relationship between patents and finance. There are two main issues.

First, some firms - particularly in the United States - are seeking patents on methods of doing business in finance, usually in connection with a patent on the associated software. The leading court case on the subject - *State Street Bank & Trust Co. v. Signature Financial Group* - is as recent as 1998¹. The decision in *State Street* has already had a dramatic impact on the number of applications containing 'business methods' claims that have been filed with the US Patent Office: in 1999 they increased by 70%. The *Financial Times* reported recently that General Electric now has 300 lawyers working full-time on patenting a number of its business methods. The application by Halifax Bank to patent its Intelligent Finance web-based mortgage account shows that the trend is not isolated to the US. However, even in Europe, it is still US firms that are spearheading the push towards patenting business methods. A recent study² found that, in 1999, US companies accounted for 52% of business method applications to the European Patent Office, compared with less than 20% for companies from the UK, Germany and France combined. If business methods were to become patentable, the consequences would clearly be far-reaching. For example, it might conceivably be possible to patent a particular kind of stock exchange or bond market, if considered to be sufficiently novel by the granting authority. This is clearly relevant in the rapidly evolving electronic

trading environment in which a number of ISMA members are investing - either in developing their own systems or by taking stakes in other platforms.

Second, lenders and investors in the world's financial markets are taking increasing exposure to technology-based firms. In many cases, the revenue-earning capacity of these firms depends on patents. In the internet arena there has been controversy regarding a number of internet-related patents. Likewise, US patent policy on the patenting of human genes has led to a heated and complex discussion. Whilst it is not possible to do full justice to the subject in this paper, a short overview is included in Chapter 4. The instinctive reaction of this author, and of many others, has been that it is morally wrong to patent parts of the human body. Greenpeace and kindred organisations have been very vocal on this point. However, a closer look shows that matters are not quite so simple. Patentability of laboratory-isolated DNA sequences that make up genes³ is likely to be sustainable in principle⁴, though patents on our body parts are not. Clearly, when assessing biotechnology firms, knowing the sustainability of their business models will often require an understanding of the sustainability of their patents.

A key reason for looking at these issues now is that a clear divergence over the boundaries of patentability is emerging between the United States, on the one hand, and Europe and Japan, on the other. In Europe, for example, a patent granted in the US on a method for administering a pension fund was refused by the European Patent Office on the grounds

¹*State Street Bank & Trust Co. v. Signature Financial Group*, 149 F.3d 1368, 1374 (Federal Circuit 1998). See Chapter 2, section 2.2 for further details.

² M.Likhovski et al. *The First Mover Monopoly*, OISWANG and Oxford Intellectual Property Research Centre, November 2000, <http://www.oiprc.ox.ac.uk>.

³ All living things are made up of cells programmed by the same basic genetic material, called DNA (deoxyribonucleic acid). Every cell in an individual organism has the same DNA units. But the different segments of DNA coding tell individual cells how to differentiate, that is, to develop into an eye or blood cell, a muscle or skin cell etc. Stretches of DNA are organised into sections called genes.

⁴ It is, however, worth noting that TRIPS (see Appendix) permits governments, subject to certain safeguards, to grant free licences to third parties.

that, as a business method, it was not patentable. Likewise, the Japanese authorities have apparently turned down the Amazon 'one-click' patent discussed below⁵. In November 2000 the Japanese Patent Office published an outline of business method policies⁶. They are also making major efforts to improve their information database on 'prior art' in respect of business methods⁷. This includes asking finance and insurance firms to supply them with information about their business methods.

At the time of writing, the European Union has been engaged in a consultation exercise over the patentability of computer software. The European Commission originally aimed to draft a directive on the subject in early 2001, but following consultations which included a vehement response from the Euro-Linux Alliance (dedicated to 'Open Source' software and, it claimed, backed by a petition with 60,000 signatures) there is, as yet, no sign of a draft. In November 2000, a diplomatic conference was held in Munich with a view to drafting a revision of the European Patent Convention. However, the conference concluded, in view of the EU consultation exercise, that it was preferable to defer a decision on whether to permit patents on business methods and software - at least until a further conference is convened within the next year or so.

So, a good deal is happening at the moment. If ISMA member firms have a view - either way - on whether or not patenting software or business methods would be a good thing, they may wish to think about putting that view to the European Commission, European Parliament and their national government. Whatever the case, firms would be well advised to consider the extent to which they need to protect themselves against possible problems. With this in mind, the chapters that follow seek to provide a concise background guide to introduce some of the critical issues.

Background

Before turning to recent developments, some basic concepts. There are three main ways in which intellectual property has traditionally been protected. In ascending order of openness these are: trade secrecy; copyright; and patents⁸.

Trade secrecy is still important. Many investment banks have proprietary option pricing models that are neither disclosed nor patented. From the point of view of society as a whole, the disadvantage of this approach is that such specialist knowledge may never reach the public domain. The secret of Titian's colours mostly died with him.

For intellectual property such as books and films - whose commercial value depends upon being published - trade secrecy is clearly not an option. For these, copyright offers protection for the specific expression of an idea. For example, one could write a book about the foreign exchange markets which attracts copyright. Somebody else could also write such a book, but they must express their ideas differently: simply copying and re-publishing the text would, more than likely, constitute an infringement of the original author's copyright. The term of copyright protection is generally quite long: the lifetime of the author plus up to seventy years in some cases. Historically, in the United States and Europe, copyright was believed to be the sole protection available for computer software. However, because copyright protects only the specific expression of a given idea, it offers less protection than patent law.

A patent grants a monopoly, usually for up to twenty years, allowing the holder to prevent the manufacture of any invention substantially equivalent to that patented. The price of this monopoly is that the inventor must disclose enough detail so that anyone 'skilled in the art' could make the device. The

⁵ It appears that the Japanese authorities have rejected a patent application by Amazon in Japan, 10-260502 filed September 14, 1998, after a "more thorough" search of prior art.

⁶ See <http://www.jpo-miti.go.jp/>.

⁷ The term 'prior art' refers to documents and information relating to the state of the art before the patent was applied for. According to the Japanese Patent Office, as of August 2000 its computer software database, established in October 1997, includes approximately 96,000 documents of which approximately 12,000 are business-related documents.

⁸ Trademarks, while important, do not appear to be central to the issues raised in this paper and are therefore ignored.

basic argument in favour of the patent system is that the invention is put into the public domain. In exchange, the inventor is protected from theft of the intellectual property. Knowledge, which might otherwise be kept a trade secret, is therefore shared with the community. Also, by having access to the patent details, competitors can 'design round' the patent, enabling them to produce a new product that is, potentially, a better one, without infringing the patent.

Clearly, a patent can offer strong protection to the inventor. However, the cost of obtaining a patent can be high, particularly for world wide cover. Further, because the cost of challenging a patent can also be high⁹, this form of protection is available only to those with significant resources. It is, therefore, crucial that a patent should not be too broad. If it is, a monopolist may be able to strangle competition.

This issue has recently been the subject of heated controversy, sparked by - amongst other matters, the publication of a report from Oxfam arguing that stronger global patent rules will increase the cost of vital medicines. On February 14, 2001 a letter was published in the *Financial Times* by 13 scientists - all of whom were Fellows of the Royal Society, a high British scientific distinction - and including a signatory from the Sanger Centre which has played a leading role in the Human Genome Project. The letter argued that "while patents do play a useful role, taken to current extremes they can produce outcomes that are bad for human welfare and, indeed, for innovation... In the case at hand, the limited benefits arising from stronger patent protection do not seem to justify the frightening health risks..." .

A related controversy has concerned the court case between a number of pharmaceutical companies and the South African government. At

issue has been the cost of drugs required to treat the AIDS epidemic. The controversy here has been particularly heated, with AIDS activists using terms such as "genocide", and it is clear that the Pharmaceutical Manufacturers Association (PMA) has created something of a public relations problem for itself by, as one newspaper commented, "putting Nelson Mandela in the dock". There are complicating factors on both sides. The South African government's hold on the moral high ground is rather weak in view of its President's notorious refusal to accept the generally held scientific view of AIDS transmission and to take action accordingly. Likewise, the drugs companies point out that, last year, they offered several African countries, including South Africa, discounts of between 70% and 90% on several drugs to treat HIV infection, with little response¹⁰. It is clear, however, as noted in the Appendix to this report, that the South African government does have the ability, if it chooses, to require compulsory licensing of drugs manufacturers under the TRIPs regime. The court case appears to turn on whether this itself is consistent with domestic South African law.

This is a complex and emotional controversy to which this report cannot do justice. All that can be noted here is that this is an area where law and politics conflict and the eventual outcome will be determined as much by political as by legal considerations. The international legal framework of the World Trade Organisation, in the shape of the TRIPs regime, appears to be sufficiently flexible to adapt to any outcome which is negotiated, despite the heated claims of AIDS and anti-globalisation activists.

⁹ The cost of challenging a patent application differs depending on the jurisdiction. In the UK, for example, it is possible to mount a challenge *before* the grant of a patent, which is much cheaper. But this, of course, relies on potentially affected parties monitoring all patent applications which might affect them.

¹⁰ *The Economist*, March 10, 2001, page 75.

CHAPTER 2

PATENTS ON BUSINESS METHODS

2.1 US patent law - historical contexts

It had always been thought that the US courts would not recognise a patent on a business method. Hence the excitement aroused by the *State Street* case, where the Court of Appeals of the Federal Circuit took the opportunity to “lay this ill-conceived exception to rest.”¹¹

The scope of patentable subject matter is extraordinarily wide, to the extent that, according to the Supreme Court, a patent could cover “anything under the sun that is made by man”¹².

However, there are limits to this broad sweep. In 1981, the Supreme Court identified three categories of subject matter that are unpatentable under US law, namely ‘laws of nature’, ‘natural phenomena’ and ‘abstract ideas’¹³. In certain cases, ‘abstract ideas’ can be held to apply to both computer software and business methods.

The statutory foundation for patent law in the United States is Title 35 of the US Commercial Code. Under 35 USC §101, in order to be patentable an invention must be:

- new;
- useful; and
- non-obvious.

Further, the invention must fall into one of the following four statutory categories:

- process;
- machine;
- manufacture; or
- composition of matter.

US restrictions on the patenting of business methods have, in fact, evolved principally from a range of court judgements, rather than by statute. In a leading case from the early 1900s, the patent at issue was a “method of and means for cash-registering and account-checking designed to prevent frauds ... by waiters and cashiers in hotels and restaurants”¹⁴. In this case the court focused on the fact that business methods are difficult to find novel:

“There is nothing peculiar or novel in preparing a sheet of paper with headings generally appropriate to classes of facts to be recorded. ... Given a series of transactions, there is no patentable novelty in recording them, where, as in this case, such record consists simply in setting down some of their details in an order or sequence common to each record.”¹⁵

The brakes continued to be applied to the scope of patentability some forty years later, when the court concluded:

“[A] system for the transaction of business, ... however novel, useful, or commercially successful is not patentable apart from the means for making the system practically useful, or carrying it out.”¹⁶

2.2 New problems

Nowadays, however, the courts have a new problem to deal with. The increasing role played by computers means that a business method can be implemented through the use of software. Code is

¹¹ *State Street Bank & Trust Co. v. Signature Financial Group*, 149 F.3d 1368, 1374 (Federal Circuit 1998).

¹² *Diamond v. Chakrabarty* 447 U.S. 303 (1980).

¹³ *Diamond v. Diehr* 450 U.S. 175, 182 (1981).

¹⁴ *Hotel Security Checking v. Lorraine*.

¹⁵ 160 F. 467 (2d Circuit 1908).

¹⁶ *Loew's Drive-In v. Park-In* 174 F.2d 547, 552 (1st Circuit 1949).

programmed into and resides in a computer which - according to the decision made in the *Alappat* case¹⁷ - can be considered a special-purpose machine. The combination of software plus machine can be patentable. Clearly, this interpretation of the US Commercial Code is of considerable significance to internet-related business, e-commerce and the financial services industry as a whole.

The landmark case, to date, on the patentability of business methods is *State Street Bank & Trust Co. v. Signature Financial Group*, considered in 1998 by the Federal Circuit¹⁸. Both State Street and Signature, the defendant, were acting as accounting agents for similar multi-tier partnership funds. Signature's patented invention was a data processing system for running a 'hub and spoke' mutual fund partnership¹⁹. When negotiations broke down for a licence to use the system, State Street brought an action claiming that Signature's patent was invalid.

The system worked by allocating assets daily for 'spoke' funds invested in the same 'hub'. For reasons of tax efficiency, the hub was a partnership and the spokes were mutual funds. It calculated how much each spoke owned of the hub, allowing for changes in value of the hub's securities. It also allowed for allocation among the spokes of the hub's daily income, expenses, and net realised/unrealised gain/loss, thereby working out a true asset value for each spoke.

According to the Federal Circuit judgement in *State Street*, if the computer took underlying share prices and, from these, calculated a price for fund units, this was a "useful, concrete and tangible result". The rule that the useful result should be "concrete and tangible" apparently was satisfied by the fact that the share price was "momentarily fixed for recording and reporting purposes," by being stored in memory. Signature's patent was valid.

Initially, the court of first instance had declared Signature's patent invalid, for two reasons. First, because it was a mathematical algorithm, and thus intrinsically unpatentable. Second, because it was a patent of a business method, which the court of first instance held to be unpatentable. Overruling this, the Federal Circuit specifically stated:

"Since the 1952 Patent Act, business methods have been, and should have been, subject to the same legal requirements for patentability as applied to any other process or method."

2.3 Evolution not revolution

Despite the excitement surrounding *State Street*, more recent history shows that it did not represent a revolution in legal thinking. Instead, it fits into a continuum of decisions, each of which have been, and will continue to be, decided on their own facts. The limits of *State Street* and *Alappat* were emphasised by the recent *WMS Gaming* decision, where the patent was for a way of cutting the odds of winning on a three-reel slot machine²⁰.

On the facts of the case, the difference between the two was held to be insubstantial and that there was an infringement of the patent. But the case does not say how much difference between programs would have been needed in order to avoid infringement. This factual decision remains open, frequently up for settlement according to testimony from expert witnesses in each case. Clearly, a programmer who knows what a patented system does and how it works could probably write a 'me too' system - in order to escape infringement. It would do the same thing, but with quite different code.

The point to note in the context of *WMS Gaming* is that it established that the courts need to compare the software used by the plaintiff's and

¹⁷ *In re Alappat*, 33 F.3d 1526, 1545 (Federal Circuit 1994).

¹⁸ 149 F.3d 1368, 1374 (Federal Circuit 1998).

¹⁹ Signature's patent is entitled "Data Processing System for Hub and Spoke Financial Services Configuration". The relevant patent class is class 705: "machines and their corresponding methods for performing data processing or calculation operations, where the machine or method is utilized in the 1) practice, administration, or management of an enterprise, or 2) processing of financial data; or 3) determination of the charge for goods or services."

²⁰ *WMS Gaming Inc. v. International Game Technology* 184 F.3d 1339 (Fed. Cir. 1999).

defendant's systems: each case will always be decided by making a subjective assessment of the software involved. *State Street*, in contrast, did not establish a 'one-size-fits-all' precedent. Although evolutionary rather than revolutionary, *State Street* - in conjunction with a number of widely-publicised patents for internet business methods such as priceline.com's patent on an internet-based reverse auction²¹ - led to a series of newspaper articles along the lines of 'the floodgates are open' for business patent applications.

Another case which has roused attention is *Amazon.com v. Barnesandnoble.com*. Both plaintiff and defendant sell books over the internet. Amazon had been granted a patent for a method whereby a single mouse click by the customer sent an order, carrying the identity of the buyer, to a server system. The District Court granted a preliminary injunction to restrain Barnes and Noble from continuing to use its, similar, system.

2.4 Concerns

Critics of these developments argue that the software industry has innovated rapidly without patent protection. They argue, too, that in a fast moving industry such as software, the 17 to 20-year protection afforded by a patent is far too long²². Further, they point out that there is no 'fair use' exemption in patent law, as there is for copyright²³. Thus, for example, a software reviewer for a computer magazine could, in theory, be prosecuted for loading a borrowed copy of patented software into his computer for review purposes.

There has also been concern that some patent claims have been far too widely cast. An example of a patent ultimately rejected for being too broad was US Patent 5,241,671 - the Compton Multimedia patent. Competitors claimed that this patent tried

to cover almost every possible way of providing a multimedia system. When a re-examination of Compton's system showed it to be a mere rearrangement of old elements, the patent was found invalid on the basis of 'prior art'.

The Compton case serves to demonstrate that errors of judgement can be made in the process of granting a patent for a business method and, indeed, associated software. In the US, critics have argued that patent examiners - typically young engineers - may lack the broad knowledge of business software needed to assess patents on business methods. At the time of the *State Street* decision, the relevant department had a total of three fully-trained plus nine partly-trained examiners²⁴. Further, the resources available at the US Patent Office for researching into and locating non-patented software 'prior art' are limited. Because old software products and processes can be very difficult to track down, there is scope for the Patent Office to issue software patents for ideas that are not really new and non-obvious.

Another potential problem lies in how to define a 'business process'. For example, it could be argued that a surgeon working in a private, commercially-owned hospital who develops a new method of heart transplants has evolved a new business process. It is, after all, a process, carried out in a profit-making business. Many would find such an argument abhorrent, taking the view that medical advances should be openly available to the human race at large.

2.5 Solutions?

The problem of how to define business methods in the context of pursuing a patent has alarmed those involved in e-commerce. Partly in response to these concerns about e-commerce, and

²¹ U.S. Pat. # 5,794,207, "Method and Apparatus for a Cryptographically Assisted Commercial Network System Designed to Facilitate Buyer-driven Conditional Purchase Offers".

²² This argument seems odd: copyright protection for software is much longer - the lifetime of the creator plus 70 years in the EU. Similarly, copyright protection for the 'look and feel' of a computer program grants protection without the underlying processes having to be disclosed as they would under a patent, preventing any attempts to 'design round' the patented software.

²³ Depending on the jurisdiction: for example, in the UK, the Patents Act 1977, section 60(5) grants exceptions for private non-commercial use and experimental use. The copyright exemption under UK law is, in contrast, far broader.

²⁴ The total has now risen to 38 (see the recent US Patent Office White Paper at <http://www.uspto.gov/web/menu/busmethp/transition.htm>).

partly in response to wider concerns aroused by *State Street*, in late 1999 US Congress created a new 'first inventor' (or 'prior user') defence against actions for infringement of patents by "any method of doing or conducting an entity's business"²⁵.

The new 'prior user' provision applies only if the party being sued had, in good faith, set the business method up at least one year before the effective filing date of the patent being sued over. However, the defence has its limitations:

- It applies only to methods used in the United States. Conceivably, therefore, a business method previously used in, say, the UK or Europe that is subsequently applied in the US might fall foul of a US patent.
- The defence does not render the patent invalid if the business method is purchased from someone else. It is, in other words, strictly personal to the first inventor.
- Further, it applies only at the sites where the business method was being carried on before the patent application (no doubt the definition of "sites" will raise issues in its own right).
- The defence is limited to methods of "doing or conducting business". Unfortunately, however, the new law falls short of defining the meaning of "doing or conducting business".
- Would-be patentees will probably be unable to find out who, if anyone, is currently using the business method that they are seeking to patent, and so could find themselves being awarded a patent of very limited value.

The new law also made provision for the creation of a new post of Deputy Secretary of Commerce and Director of the Patent and Trademark Office, whose task is to implement regulations regarding the re-examination of patents. Hopefully, this will help to swiftly reduce the number of 'bad' patents that are awarded.

²⁵ To effect the new law, Congress added provisions to the omnibus spending proposal, Title IV of the Consolidated Appropriations Act, 2000 Pub. L. 106-113 (1999). This part of the budget act is often referred to as the 1999 Patent Law.

2.6 Summary

In summary, on the subject of the patenting of 'business methods', the developments in *State Street* and *Amazon.com* are a culmination of a trend in which patent protection in the United States is becoming broader. Given the scale of activity that has been triggered by this apparent change in philosophy underpinning these US court judgments, ISMA member firms may wish to consider whether their business methods – whether inside or outside the United States – might become the subject of a patent lawsuit. This applies particularly to e-commerce, given its inherently global nature.

At the moment, and as the Appendix covers in more detail, it seems unlikely that the European Patent Office (EPO) will follow the US approach. Indeed, as mentioned in Chapter 1, the US approach has been specifically rejected by the EPO. However, for ISMA members it would probably be a wise precaution to have documentation in place to demonstrate when a specific business method and its associated computer system was implemented. Furthermore, in an increasingly global financial marketplace, international firms doing incidental business in the US - for example, placements under Rule 144A or global bond offerings - might be exposed to challenge.

CHAPTER 3

PATENTS ON SOFTWARE

3.1 In the United States

The problem with computer software has been to distinguish it from 'abstract ideas' which, as mentioned in Chapter 2 in the case of *Diamond v. Diehr*, the Supreme Court held intrinsically unpatentable²⁶. The case related to a computer controlled process for curing rubber. For the court, the mere fact that the patent used a computer to apply a mathematical formula in controlling a process did not mean that the formula itself was being sought the protection of a patent. There was a "useful, concrete and tangible result", rendering the patent valid.

In the years that followed, many attempts were made to patent software. Critics argued against a system which permitted a monopolistic patent on a drug like Prozac – a multi-billion dollar industry in its own right – but denied a patent on software. To allow patent law to have such an enormous impact on one industry, while excluding patent protection from another, seemed incongruous. While the courts generally continued to reject patent protection for pure software, the boundaries were gradually extended. The decision of the Federal Circuit Court of Appeal in the *Alappat* case was widely hailed as clearing the way for patent protection of a host of devices and processes using a computer. In that case, the court held that data, transformed by calculations to produce a smooth waveform display, produced "a useful, concrete and tangible result", i.e. the waveform:

"a general purpose computer in effect becomes a special purpose computer once it is programmed to perform particular functions pursuant to instructions from program software."²⁷

In March 1996, new guidelines issued by the US Patent and Trademark Office laid down that software could be patentable. According to the guidelines, the software must provide some type of function to the computer in the form of data structures and programs. Also, the patent examiner must see if the invention has a practical use. Furthermore, the software must be new, compared with all other computer programs and computer systems. Its new features must be "not obvious" to computer programmers. The guidelines still state that music, text, other literary works and simple data compilations are not patentable.

Under this approach, software is likely to be patentable in the US if:

- (i) it receives and processes real-world (i.e. useful, concrete, and tangible) data; or
- (ii) it produces a real-world output (manipulation of information inside a computer alone will be more difficult, but still not impossible, to patent).

3.2 In Europe

Regarding patenting of software in Europe, Article 52 of the European Patent Convention (see Appendix) expressly excludes methods of doing business and computer software from the definition

²⁶ *Diamond v. Diehr* 450 U.S. 175, 182 (1981).

²⁷ *In re Alappat*, 33 F.3d 1526, 1545 (Fed. Cir. 1994).

of patentable subject matter in the European Union. Furthermore, in 1991, the European Union software directive laid down that copyright, not patent, is the proper vehicle for the protection of software.

In practice, however, there has been a considerable blurring of the edges. According to guidelines issued by the European Patent Office (EPO), patentable inventions must have a "technical character". In its decision on SOHEI²⁸ the EPO said that, if technical considerations were applied to arrive at the invention, the invention has technical character. Further, if a computer solution to a problem is different from how a human would solve the problem, technical considerations should be assumed. In reaching its decision, the EPO further stated that "as to computer programs, Article 52 (2) (C) was only intended to exclude program listings."

In early 1999, in considering two claims made by IBM, the EPO accepted that a computer program, on its own, is patentable if it brings about a technical effect beyond the 'normal' physical interactions between software and hardware. In one case²⁹, the invention related to detecting where a second window in a computer display overlies part of a first window to obscure information contained in a portion of the first window. In the other case³⁰, the invention related to resource recovery in a computer system in the event of failure. In certain cases this offers significant new patent protection for software.

The IBM decisions follow a line of similar cases where the EPO has allowed patents where the software solves a technical problem³¹ or where technical considerations are involved to arrive at the invention, as in SOHEI.

²⁸ T769/92, OJ 1995, 525 (in respect of Sohei Yamamoto and Moriyama Teruko)

²⁹ T0935/97-3.5.1.

³⁰ T1173/97-3.5.1.

³¹ For example, the VICOM decision T208/84, OJ 1987, 14.

CHAPTER 4

BIOTECHNOLOGY PATENTS

The third area of patent policy that has aroused great controversy is US biotechnology patents.

The patent granted to Myriad Genetics Inc.³² in respect of "17Q-linked breast and ovarian cancer susceptibility gene" (BRCA1, a gene implicated in breast cancer) provides a concrete example. The claim is not, in fact, for the gene but for:

1. An isolated DNA coding for a BRCA1 polypeptide...[technical detail omitted]
2. The isolated DNA of claim 1...[]
3. The isolated DNA of claim 1 which contains BRCA1 regulatory sequences."

The remainder of the claim is for:

- "4-7. [Other related isolated DNAs]
- 8. A replicative cloning vector which comprises the isolated DNA of claim 1 or parts thereof and a replicon operative in a host cell.
- 9-13. [Similar vectors] ...
- 14-20. [Various methods and kits]".

Myriad and those that support its claim therefore distinguish between a patent claim on a gene, which exists naturally in the body, and the laboratory-isolated DNA sequence³³.

Clear differences of opinion exist between qualified scientists on the issue of genetic patenting. To illustrate the point, in the 1980s the US National Institutes of Health (NIH) - a publicly-funded institute - attempted to patent a collection of gene sequences. Mr. Craig Ventner - a scientist at NIH involved with its Human Genome Project (HGP)³⁴ - had made a library of all the genes expressed in the human brain,

and subsequently sequenced parts of each gene. Ventner, however, was unable to explain what any of the sequences actually did in the human brain, so the patent was rejected on the grounds that the sequences lacked utility. Later, the NIH withdrew the application following the high-profile resignation in 1992 of Mr. James Watson as the first director of the NIH genome institute in a dispute over whether to patent DNA sequences³⁵.

Concerns over the issue were heightened when, in October 1999, Celera Genomics filed some 6,500 provisional patent applications on various genes. Celera was set up by Venter - having left the NIH - to compete with the HGP. An agreement was however patched up whereby former US President Clinton and UK Prime Minister Blair were able to announce that the HGP and Celera had "simultaneously succeeded in decoding the genome tensions between the two organisations over patenting remained. The final publication of the scientific results of each team was done separately because of the HGP's objections to Celera's approach. Ironically, the confirmation that the human genome consists only of about 30,000 genes may weaken Celera's patents. This is because it indicates that many genes have multiple functions so that the idea 'one gene - one function - one patent' is unlikely to work. This is important because of the need for "utility" of the patent: if Celera is not able to show that it knows exactly what the gene does, the patent may be difficult to sustain.

Celera's application is not isolated in causing

³² United States patent no. 5,747,282.

³³ A comment on the scientific validity of this distinction lies outside the author's expertise.

³⁴ A collaborative effort, run by the Wellcome Trust (UK), the Sanger Laboratory at Cambridge (UK) and the NIH.

³⁵ In 1953, Watson won the Nobel Prize for discovering DNA's double-helix structure.

public anxiety. The ramifications of gene patenting if this - and other firms' applications - succeed may be illustrated by the following example, which involves the gene for Canavan disease.

Discovered in 1993 by doctors at Miami Children's Hospital, the disorder attacks an infant's brain, robbing the baby of normal development, blinding and eventually killing the child. Its victims are primarily people of Eastern European Jewish descent. In 1998 the hospital sought to enforce genetic patent rights and began negotiating a USD 12.50 royalty on each test performed by various academic laboratories³⁶. The test tells prospective parents whether they are at risk of having an affected child. The hospital also limited the number of tests that each lab could carry out. Canavan-affected families fear that this cap will deny them access to the test. The hospital argues that, because the disease is so rare, only 30,000 people a year will need the test and that it will not therefore make enough on the patent to cover the USD 5 million it invested to find the gene.

The Miami hospital case is not unique: according to one recent survey³⁷, 90% of 150 US clinical genetics laboratories said that they had withheld tests because of onerous patent claims. However, amidst heated discussions on the issue, there have been signs of a fight-back, illustrated by the following statement by the Wellcome Trust, a major UK charitable body which largely supported the Human Genome Project:

"The mission of the Wellcome Trust is to foster and promote research with the aim of improving human and animal health. This is ... the basis for its policy on the protection and use of intellectual property rights ...

"In order for research advances to qualify for intellectual property protection, the legal criteria for patent protection must be fulfilled.... Patents ...

covering genes and their products are no exception, and the Trust is supportive of these if there is sufficient information to indicate that the DNA sequences in question can be used to develop healthcare benefits. The Trust does not support the patenting of raw DNA sequences in the absence of such information. This is in line with EU law, which states that a gene sequence, whether partial or complete, is only patentable when it has been isolated and its function described:

"The Trust is particularly concerned about patents and patent applications which are unreasonably broad and opportunistic, e.g. when there is limited functional data available to support those patent claims. The Trust may challenge such speculative patents if it believes that they are being applied for or used in ways that could be detrimental to research or limiting to the development of healthcare benefits."³⁸

Although the Trust is an interested party, as a non-profit organisation that has contributed greatly to gene research, its views must carry some weight. It is worth noting that the Trust supports the patenting of gene sequences that can contribute to healthcare. Its concern is directed towards broad or speculative patent applications, which others might use unreasonably to restrict healthcare activities. Clearly, these issues will be decided on a case-by-case basis, but the Trust's willingness to challenge speculative patents suggests that 'bad' US patents may well not be sustained in the UK or perhaps elsewhere.

Finally, for the purposes of this chapter, it should be noted that the issue of genetic patenting has been addressed by the EU in a directive covering the legal protection of biotechnological inventions.³⁹ The directive provides, in part:

"...discoveries, the human body at the various stages of its formation and development and processes for cloning human beings and for modifying

³⁶ As reported in the *Miami Herald*, November 14, 1999.

³⁷ Salon (www.salon.com) March 7, 2000.

³⁸ <http://www.wellcome.ac.uk/en/1/biopolpat.html>.

³⁹ 98/44/EC of July 6, 1998.

the germ-line genetic identity of human beings may not be regarded as patentable inventions....

"Plant and animal varieties and essentially biological processes for the production of plants or animals, including crossing or selection, are not patentable....

"An element isolated from the human body or otherwise produced by means of a technical process, including the sequence or partial sequence of a gene, *may constitute a patentable invention*" [emphasis added].

CHAPTER 5

PATENTS IN FINANCIAL SERVICES

Bearing in mind the developments outlined in the previous three chapters, this chapter looks at examples of specific patents that have been granted in the financial services area. There are a very large number of these – as can be seen by visiting the US Patent Office web site⁴⁰ and searching on key words such as "Merrill Lynch" or "investment". A selection follows.

Example 1

Granted to an employee of Merrill Lynch⁴¹ and subsequently assigned to the company⁴², this patent is for a "Securities brokerage-asset management system". The abstract states:

"A central asset management system is provided having a central reference facility for co-ordination of all transaction processing. For each customer, a unique identifier (UID) is assigned as a stable, semi-permanent tag. The UID is then used for subsequent processing relating to that customer, even with multiple customer accounts, rather than individual transaction numbers for each process. Use of the UID is facilitated through a front-end processor that handles all incoming external transaction data and converts it into a usable format, cross-referenced with the appropriate UID. Use of the UID reduces the overall variability and number of transaction identifiers, thus increasing efficiency and simplifying all aspects of the system. The system makes other simplifying uses of the UID, for example, as a key for segregating the transaction processes into different

processing areas to be performed simultaneously. Once processed, transactions are converted back into the necessary formats usable by various external systems by a back end processor." ⁴³

The key to this patent seems to be in assigning a unique ID to each customer, regardless of how many accounts they have, rather than individual transaction numbers. It was apparently applied for in respect of Merrill's well-known Cash Management Account (CMA) in the US, building on four separate patents which underlie the CMA⁴⁴.

Without the specialist knowledge of a patent examiner, it is beyond the scope of this paper for this author to comment on whether or not this invention was worthy of being granted a patent. As an initial reaction, the concept involved hardly seems non-obvious, making it reasonable to question how far the particular examiner was familiar with the 'prior art'.

Example 2

Another patent, assigned to Citibank⁴⁵, is for a "Method and system for improved collateral monitoring and control". The abstract states:

"A system and method is provided for advanced multi-currency collateral monitoring and controlling for use in a variety of businesses. The system maintains portfolios of collateral accounts and liability information. It supports transaction processing whether by manual input or S.W.I.F.T. messaging. The system has the ability to apply acceptance rules in determining whether a security

⁴⁰ <http://www.uspto.gov>.

⁴¹ US patent no. 5,940,809 (filed in August 19, 1996; granted: August 17, 1999).

⁴² Unless otherwise stated, this pattern of assignation from the individual grantee to the company applies for each patent mentioned.

⁴³ Author's note: a patent expert has commented that the abstract is often much broader than the patent claims, and it is the latter which are important. With this in mind, in the case of each of the three patents discussed in this section, the claims themselves have been reviewed. The comments made here apply equally to the claims, as well as to the abstracts. The claims have not been reproduced in full because they are much more lengthy.

⁴⁴ Patent nos. 4,346,442; 4,376,978; 4,597,046; and 4,774,663.

⁴⁵ US patent no. 6,018,721 (filed: May 19, 1997; granted January 25, 2000).

purchase by a client is of a sufficient quality as to have collateral value. Additionally, the system may hold-up or prevent a security sale based upon insufficient collateral remaining in the client's accounts. Tables, preferably located in a relational database, are included within the system for assessing the risk associated with holding securities of a particular type, and the risk associated with holding securities in currencies other than the liability currency."

Again, none of this seems earth-shatteringly new.

Example 3

This example is of a patent filed by Morgan Stanley⁴⁶ for a "Data processing system and method for financial debt instruments". The abstract states:

"A data processing system and method is disclosed for implementing and control of a financial instrument which is issued for a limited period of time. The instrument is based on an underlying basket of stocks, optimally selected to track an established capital market and its price also reflects accrued investment income and maintenance expenses. The data processing system receives input from the capital market and periodically evaluates the performance of the financial instrument, reporting its price to customers. Also disclosed is a data processing system for administering an investment group of such instruments designed to track the performance of several domestic and foreign markets, estimate their return and provide current price information to customers."

Enough has perhaps been said to convey the flavour of the patents involved. Whilst those more expert in the field than the author of this paper may disagree, these patents appear to contain very little that would justify their acceptance under a more

rigorous patent system. It therefore seems unlikely that they would be accepted by the European Patent Office, and rightly so.

Those with long memories may recall that the birth of the Eurodollar market arose not just from the introduction in the United States of Interest Equalisation Tax, but also from the Federal Reserve's Regulation Q. It may be that the beginnings of a similar phenomenon are starting to emerge. If broadly-drawn patents in United States succeed in stifling innovation, this may in fact benefit London and the major European markets. On the other hand, it must be conceded, none of these patents seems to have destroyed the ability of the US financial system to keep innovating. Those who favour broadening the scope of patentability to include business processes - who mainly seem, unsurprisingly, to be patent lawyers - would doubtless argue that this is because patents stimulate competitors to design round them. It could also be argued, though, that these patents are very new and that their effects have yet to be seen.

Whichever the case, ISMA members may wish to consider investing a degree of resources in assessing the patents granted in the United States in respect of their lines of business. If nothing else, the background knowledge gained would assist them, if it became necessary, in objecting to the filing of applications for a parallel patent in Europe or elsewhere.

⁴⁶ US patent no. 6,092,056 (filed: May 17, 1999 : granted: July 18, 2000).

CHAPTER 6

INVESTMENT ASSESSMENTS OF PATENTS

As the content of the previous chapters indicates, it is likely that patents will, in future, play a greater part in the financial calculations of ISMA member firms than they have in the past. It may, therefore, be helpful to make some brief comments on patent valuation⁴⁷.

6.1 Patent valuation

The value of a patent is, basically, the value of extra profits earned from exploiting the invention, compared with what might be earned without a patent. The commercialisation of inventions and the patents that protect them are, therefore, two different issues. If the patent is declared invalid, the firm may still beat others to market and earn revenue from the invention. Conversely, if it fails to develop the invention, it can still earn a stream of revenue from the patent by licensing out to others the right to use it.

For the purposes of this discussion, therefore, the risks and costs of building a production facility (or computer system) for the invention need to be set aside. Instead, the focus should relate purely to the costs of obtaining the patent, and the extra revenues it will provide, compared with not having a patent.

In essence, there are two possible ways of construing this analysis. First is the traditional discounted cash flow (DCF) approach. Second is a variant of 'real option' theory, under which each stage of the patent application is treated as paying a

premium for having an option to proceed further.

Applying the DCF method involves making an assumption about the discount rate to be applied to future cash flows. With a multi-stage cash-flow such as a patent the risk will vary over time. It would clearly not be right to apply a single rate of discount. A newly granted patent, about to be litigated for the first time, will be much riskier than a 15 year old veteran which has survived many attempts to attack it. Indeed, the use of a single discount rate actually makes the opposite assumption that the risk of a successful challenge increases as the patent ages. A possible solution to this problem might be to apply two separate discount factors: (i) a pure legal risk discount, which would be a high in the early years and low in later years, and (ii) a discount for the time value of money applied to risk-adjusted cash-flows. A related point, working in the opposite direction, is technical obsolescence. The risk of this clearly increases over time.

A problem with the simple DCF method is that no account is taken of the various choices open to a patent applicant. The patent could be allowed to lapse or be abandoned. After the first application, there is also the option to make foreign applications. If the number of such possibilities is limited, and they only occur at defined times, it may be possible to use decision-tree analysis. This ought to be based on an underlying DCF analysis of each branch, starting with the final ones and working back in time to give a present value.

Probably the broadest and most theoretically

⁴⁷ This section draws on *The Valuation of Patents* by Robert Pitkethly, The Said Business School, University of Oxford, 1997 <http://www.ojprc.ox.ac.uk/EJWP0599.html>

sound approach to patent valuation is a variant of the compound financial option. However, this needs to be adjusted to take account of the fact that the patent applicant is dealing with real options. It would be necessary to build a tree of possible outcomes in terms of incremental cash flow attributable to the patent. Where appropriate, a legal/obsolescence risk discount factor would need to be applied to cash-flows at various points on the tree. The trees would need to be built in respect of each option point (e.g., whether to file the patent, whether to file for foreign patents, whether to incur legal costs defending the patent, and so on). A problem is the fact that some of these option points, particularly in respect of defending the patent against legal challenge, may be hard to predict in advance. A crude solution might be to apply a ‘legal costs reserve’ at the point at which the patent application is made, on the assumption that, if it is valuable, somebody is likely to try to challenge it.

6.2 Future opportunities

There is much scope for work here. Perhaps the next great field for derivatives will be patents? Stripping out the value of a bundle of patents from the value of a firm could provide some interesting trading opportunities. Of course, in the case of some biotechnology firms, its patent rights may account for the entire value of the firm. In a similar vein, one could imagine ‘mature’ patents being securitised.

CHAPTER 7

CONCLUSIONS AND OUTLOOK

7.1 Conclusions

In conclusion, as the foregoing chapters serve to illustrate, there are substantial difficulties in enlarging the boundaries of patent protection to software and to business processes - a view reinforced by the decision of the November 2000 diplomatic conference in Munich (designed to update the European Patent Convention) to defer the issue before making a hasty decision. To date, it is not clear that a strong case has been made for the need for such an extension.

US policy on what is or is not patentable has evolved considerably, particularly in the 1990s. The situation remains fluid, especially in the area of biotechnology where many of the patents are new and may not yet have been tested in court. As regards business methods, and the associated software, the recent creation by Congress of the 'first inventor' defence was a response to the controversy created by the *State Street* and *Amazon* cases, amongst others. It is by no means clear that the new defence has done much to solve the problem.

The main issue to deal with, so far as business methods are concerned, is the question of novelty. It is hard to find out about business methods, since they are often not written down for publication outside a firm. Because firms want to retain trade secrets, and also due to perceived prohibitions on the patenting of business processes, finding relevant 'prior art' is usually extremely difficult. Also, defining the limits of patent protection is very hard, as the

tortuous legal history in the US shows. As explained in the previous chapters, America has in recent years tended towards a broader view of what might be suitable for patent protection.

Looking at the financial services industry, for many firms, software is a critical competitive advantage. For all firms, software is a major expense. Because the move towards on-line trading and real-time settlement represents an increasingly demanding software environment, this trend is unlikely to be reversed. Firms that invest very large sums in developing software to manage their business processes have, morally at the very least, a right to protect their investment.

This leads the argument in favour of patent protection. A competitive advantage might be gained by preventing others from using the underlying concept until they have developed alternative software which 'designs around' the patent.

However, in many cases it would in fact be difficult to obtain such protection, particularly in Europe. Very often the underlying concepts of the software are not in themselves novel. A more efficient way of organising or storing data may be conceptually 'obvious' to a 'skilled practitioner of the art', and so not worthy of patent protection. In addition, as most business managers will acknowledge, much of the expense of any software upgrade is not writing the software. It comes from testing the software, reorganising data input/output, ensuring appropriate links to other legacy systems and so on. Patent protection will only cover a small

fraction of that investment.

Furthermore, a disadvantage of patent protection from the competitive point of view is that the underlying concepts have to be put into the public domain. For this reason, many firms have taken the view that their best protection is to treat their software as a trade secret. Likewise, it has been argued that the real protection lies in ensuring that firms keep innovating fast enough to stay ahead of their competitors.

When it comes to patenting business processes, further difficulties arise. As referred to above, the availability of 'prior art' tends to be limited and patent examiners are typically not experienced in, for example, methods of investment management. Certainly, if patenting of business processes is to be permitted, there is a good case for reviewing the methods by which 'prior art' is examined, and probably for liberalising arrangements for challenging patents once they have been granted.

The hasty introduction by US Congress of the first inventor defence merely serves to highlight the scale of the difficulty. Congress has recognised that there is a potential problem, as discussed previously⁴⁸, but the remedy is extremely limited. Given the rapid growth of the internet and its implications for novel business processes, this is a critical issue for the development of e-commerce.

7.2 Outlook

ISMA members

For ISMA member firms, for any business methods which they propose to use in respect of conducting business in the United States, it would be wise to ensure that documented records are in place showing when the firm first began to use any given business method. This would help prove, if

necessary, that the method had been 'invented' before any relevant patent had been filed in the US.

Consideration might also be given to ensuring that the material is placed in the global 'prior art' database being developed by the World Intellectual Property Organisation⁴⁹.

ISMA members outside the US may wish to consider making representations to their national patent authority as to whether or not software or business methods should be patentable in their own country.

Patent authorities

On the part of patent authorities, if changes are made in the direction of granting broader patent protection, it will be critical to ensure that sufficient resources are allocated to (i) the patent examination process and (ii) understanding what constitutes 'prior art'. This is particularly true if patents are to be granted on business processes. Otherwise, there is a serious danger of granting excessive monopolies to firms which are not necessarily inventive but which have astute and well-paid legal advisers. There is a risk that patent offices may wrongly conclude that software and/or business methods are 'novel', simply because they do not have sufficiently detailed records of what is in use already.

⁴⁸ Chapter 2, sub-section 2.5.

⁴⁹ See Appendix.

APPENDIX

Many ISMA member firms may be interested as to whether or not recent policy developments in the United States could cross the Atlantic to Europe, or indeed to Asia. This raises the issue of cross-border recognition of patents.

The global situation

At present, there is no such thing as an international patent. Each country has its own approach. So far, neither the UK approach, nor the European Patent Convention (to which the UK and all other EU members belong) followed what has been adopted in the US. Because each national jurisdiction has its own methods, particularly in Asia, a detailed discussion of each is outside the scope of this paper. It may, however, be helpful to give a brief background and provide a comment on the European Patent Convention, which covers probably the largest single economic area outside the US likely to be affected by these developments.

The underlying basis for multinational protection for intellectual property is the Paris Convention of 1880, which established the principle of 'national treatment' under which signatories to the convention must grant nationals of other member countries equal treatment. In 1967, the secretariat of the Paris Convention became a specialised agency of the United Nations under the name of the World Intellectual Property Organisation (WIPO). At the time of writing there are 197 member states of WIPO.

WIPO has played a key role in developing

national patent regimes, particularly in the developing world. More recently, in March 1998, WIPO took steps to move towards the creation of a global secure high-speed digital network which will eventually provide a common automated database of 'prior art' to all of the patent offices of the world. Clearly, if business methods were to be patentable, it would be important to ensure that this database contains adequate information about business methods. WIPO has also established an arbitration centre for disputes over internet domain names.

The next important step in international patent law was the Washington Treaty of 1970, known as the Patent Co-operation Treaty (PCT). This was a key step towards rationalising the filing of patent applications worldwide. 95 countries have now acceded to this treaty, which operates under the Paris Convention and is run by WIPO. However, the PCT has its limitations. Whilst the treaty streamlined the international patent application, filing, searching and preliminary examination into a two-step procedure, it did not go as far as creating an 'international patent'. The final responsibility for granting patents still rests with each national patent office.

Europe - the European Patent Convention

The European Patent Convention (EPC) was adopted in 1973. It is also a regional patent treaty under the PCT, meaning that European patents can be granted on the basis of international applications

filed under the PCT. There are currently 19 member countries of the EPC, including all member states of the European Union.

Under the EPC, one can file a single patent application with the European Patent Office (EPO) in one of the three official languages. This gives patent protection in one country or up to all 19 contracting states but it does not result in a single 'EU patent'⁵⁰. Instead, applicants receive a series of patents enforceable in each member country. The EPC also provides for the 'package' of patents to be opposed after being granted, provided the application is made within nine months.

As is mentioned throughout this paper, a diplomatic conference regarding the European Patent Convention was held in Munich in November 2000. The conference adopted a Revision Act whose new provisions will not enter into force immediately, because they must first be ratified by each member state. The revised Convention is therefore unlikely to come into effect another four or five years.

In this context it should be noted that, prior to the conference, the member countries of the European Patent Organisation decided not to consider biotechnological innovations during their deliberations - due to the impending implementation by many countries of the EU biotechnology directive. The conference also decided to leave the position regarding the patenting of computer software unchanged for the time being. However, it urged the European Patent Organisation to make preparations for a further diplomatic conference to consider patenting of software and, possibly, biotechnology issues.

Finally, it should be mentioned that the European Commission⁵¹ has again proposed the creation of a European Community patent – aiming to replace the multiple European patents granted under the European Patent Convention with a single

EU patent. This has been tried before, in the 1960s and in 1975 with the abortive Luxembourg Convention, which was never signed by enough EU members. Given that, this time, the Commission is proposing a regulation (immediately law in every state) rather than a directive (requiring approval by national parliaments) the proposal will probably take some time, if it succeeds at all.

Trade-Related Aspects of Intellectual Property Rights (TRIPs)

In the cross-border arena, it is also relevant to note the 1994 agreement on Trade-Related Aspects of Intellectual Property Rights ("TRIPs"), which was signed at the conclusion of the Uruguay round of GATT negotiations.

According to TRIPs, no nation may discriminate in its patent system based on field of technology - important to the pharmaceutical and biotechnology industries. It sets the term of patents to be at least twenty years from the time of filing and limits the ability of member countries to grant compulsory licences under patents that they have granted. Member countries that do not comply are subject to sanctions following a dispute procedure under the auspices of the World Trade Organisation.

TRIPs also clearly states:

"Computer programs, whether in source or object code, shall be protected as literary works under the Berne Convention."

Further, members may exclude from patentability:

- (a) diagnostic, therapeutic and surgical methods for the treatment of humans or animals;
- (b) plants and animals other than micro-

⁵⁰ Its costs are therefore high, entailing translation costs for each country. The European Commission claims, in its proposal for a European patent (COM(2000) 412 final published 1 August 2000) that the total cost of getting a typical patent, enforceable in eight EU member states, was EUR 49,900 - almost five times the EUR 10,330 cost of the equivalent patent in the US and three times the EUR 16,450 cost in Japan. Simply translating a patent into all eleven official EU languages costs more - at EUR 17,000 - than getting a patent in either the US or Japan.

⁵¹ COM(2000) 412 final published August 1, 2000.

organisms, and essentially biological processes for the production of plants or animals other than non-biological and microbiological processes. However, Members shall provide for the protection of plant varieties either by patents or by an effective ... system ...”

In addition:

“Where the law of a Member allows for other use of ... a patent without the authorisation of the right holder, including use by ...third parties authorised by the government...:

- ...
- (b) such use may only be permitted if...the proposed user has made efforts to obtain authorisation from the right holder on reasonable commercial terms ... [and] such efforts have not been successful within a reasonable period of time. ”

