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Hazel V J Moir

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Correspondence to: hazel.moir@anu.edu.au

Dr Hazel Moir
Program Visitor
Centre for Governance of Knowledge and Development
Regulatory Institutions Network (RegNet)
College of Asia and the Pacific
The Australian National University
Canberra ACT 0200
AUSTRALIA

How high is the inventive step? Some empirical evidence^{*}

Hazel V J Moir

Program Visitor, Centre for Governance of Knowledge and Development
Regulatory Institutions Network, College of Asia and the Pacific
The Australian National University

Abstract

Despite the active debate about a low current standard for patent inventiveness, there has been little attempt to measure it. The study reports data from recently granted Australian business method patents, tested against an economic rather than a legal inventiveness yardstick. The 72 cases were assessed for their contribution to knowledge or know-how—none were found. The data are organised to throw light on the key reasons for the monopoly grant to these uninventive patents. They show that a range of procedural rules operating to allow grant of a patent monopoly to many ‘inventions’ that offer no advances in knowledge or know-how, and so provide no social benefits.

Many of the cases in the dataset have parallel overseas applications and a review of the communications between applicants and examiners at the EPO and the USPTO throws light on overseas grant practices. While half the applications that have been assessed by the USPTO have been rejected, the other half has been accepted, and the procedural problems identified in Australia are also evident in the USA. The situation at the EPO is more complex, as rejection is usually based on the lack of a “technical effect”. But three very trivial software systems have been granted patents by the EPO. It is unclear how they managed to pass either the technical effect test or the inventiveness test.

As it is a range of rules and procedures which have allowed the grant of these patents, it seems likely that equally trivial patents are being granted in other fields of technology.

^{*} The material in this Working Paper was presented at the 4th Annual Conference of the EPIP Association, University of Bologna, Italy, “Measuring the value of IPR: theory, business practice and public policy”, 24-25 September 2009, and I would like to thank participants at that conference for comment and criticism. The papers presented at that conference can be found at <http://www.epip.eu/conferences/epip04/programme.php>. I would also like to thank William van Caenegem for comments on an earlier version of this paper. Needless to say, remaining errors or omissions are my responsibility.

How high is the inventive step? Some empirical evidence*

INTRODUCTION

From an economic perspective, the rationale for the patent intervention in the market for innovation is that, absent such intervention, there will be insufficient innovative effort to maximise economic well-being. The monopoly incentive in theory encourages a shift of resources to innovation. If this inducement effect works, there are inevitable static efficiency losses. Patents are thus inherently a second-best solution to alleged problems in innovation markets. As it is not the goal of any government to reduce national economic well-being, the benefits from the induced innovations must exceed the costs of the patent system.

There is thus general agreement that balance is critical to good patent policy. But at a practical level difficulties arise. The benefits of a patent system arise only from induced innovations. Welfare losses arise only from patent monopolies which are actively used or which impede other innovations. How in practice can one decide between innovations meriting a monopoly and those that do not? Requiring that benefits exceed costs for all patent monopolies is one approach. The economic benefits are the dynamic growth contributions of innovations that would not otherwise happen, and their knowledge spillovers.¹

None of this is well spelled out in patent statutes. Most patent statutes do not specify the purpose of patent law: they merely set out the privileges to be granted and the conditions for gaining these. The shortest and clearest statement of the economic goal of invention monopolies is perhaps that from the General Court of Massachusetts in 1641:

"There shall be no monopolies granted or allowed among us, but of such new inventions *as are profitable to the country*, and that for a short time"

(Warshofsky, 1994: 32, emphasis added).

Over time courts have sought 'objective' means to determine when an innovation has sufficient likelihood of returning a benefit to the nation to merit a monopoly grant. The main gate-keeping weight currently falls on 'inventiveness', and it is this proxy which generally determines whether or not a patent will be granted: It is important to keep patentability requirements high if innovation is to be encouraged (Encaoua, Guellec and Martínez, 2006). This paper asks whether the 'inventiveness' proxy actually acts to discriminate between applications where there will be a 'profit to the country' or not.

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¹ This economic perspective contrasts markedly with the legal perspective holding that the 'consideration' in exchange for the monopoly privilege is disclosure. Surveys on the sources of innovative ideas suggest patent documents are among the least used sources of technology information, except for patenting purposes (Mandeville, Lamberton and Bishop, 1982; Oppenheim, 2000; Macdonald, 2003). Machlup (1958) dismissed as entirely fallacious the idea that disclosure is a benefit of patent systems, arguing that there was an incentive only to patent that which could not be kept secret. Ghosh suggests this legal view of the patent exchange might mislead in terms of complex points of patent law and patent administration (Ghosh, 2004).

WHAT IS KNOWN ABOUT THE HEIGHT OF THE INVENTIVE STEP

Much of the substantial doctrinal literature on the US inventive step argues that since 1982 the inventive step has fallen to very low levels (see, e.g., Barton, 2000; Hunt, 1999; Lunney, 2001).² Some of these studies include examples of very trivial patents. Jaffe and Lerner comment on the famous “sealed crustless sandwich” patent (Jaffe and Lerner, 2004: 26-27). Dreyfuss describes several highly obvious ‘business method’ patents.³ Lerner reviews two financial patents, citing pre-existing academic knowledge indicating that both the novelty and the inventiveness of these patents are problematic.⁴

Beyond these anecdotes that many patents are at best only marginally inventive, there are few studies which clearly define or attempt to measure the difference between an incremental and a radical innovation (Dahlin and Behrens, 2005). Dahlin and Behrens use relative differences in the classes of cited existing knowledge to offer an approach to identifying truly radical inventions. However there is a major asymmetry between trying to measure radical inventions and trying to measure incremental inventions, so it is not possible to invert their approach to identify genuinely uninventive inventions. It is, however, likely that the distribution of patented inventions by inventiveness is highly skewed. In developing their proxies Dahlin and Behrens reject their first two approaches as these identify, respectively, 20 percent and four percent of tennis racquet patents as radical and these percentages are considered too large. Their final configuration succeeds in identifying only one percent of patents and finds a good correlation with independent views as to radical tennis racquet inventions.

The innovativeness distribution of patented inventions may therefore look something like that in Figure 1, though it should be emphasised that this is a notional not an empirically based distribution. It draws on the view that the percentage of truly innovative inventions is small, and on a view from ‘the patent community’ that much of what is patented has little if any inventiveness to it.⁵ This distribution shown here is marginally more skewed than that presented by Intellectual Property Research Institute of Australia (IPRIA) researchers in their investigation into the effect of raising the statutory inventive step in Australia (Jensen et al., 2008: 14). The critical—but unknown—issue is where along this distribution social returns are likely to exceed social costs. One way to try to estimate this is by investigating those patented ‘inventions’ lying at the left-hand end of the scale. Is it possible to estimate what proportion of granted patents are for inventions where there is unlikely to be any contribution to economic well-being?

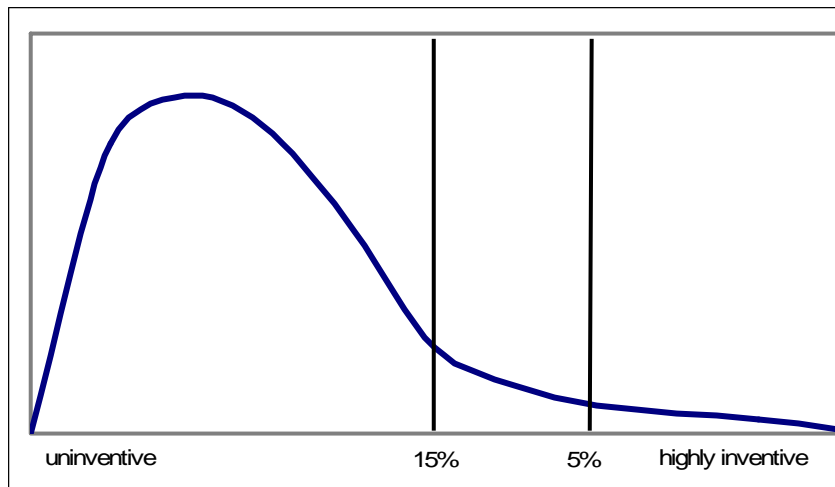
² It is as yet too early to tell how much influence the recent Supreme Court *KSR v. Teleflex* decision (127 S.Ct. 1727 (2007)) will have on the height of the inventive step in the USA (for a discussion of the judgement and its implications for balance in the patent system see Dreyfuss, 2008).

³ She discusses examples such as the architectural patent for saving hall space by building external stairs and the famous priceline.com reverse auction system, which she points out had for some time been used by the US Treasury which “sells hundreds of billions of dollars’ worth of securities each year” (Dreyfuss, 2000: 268).

⁴ U.S. Patent 5,884,286 awarded to Vergil Daughtery III in 1999 for the valuation of infinitely lived call and put options and U.S. Patent 5,940,810 awarded to Joseph Traub, Spassimir Paskov and Irwin Vanderhoof in 1999 (assigned to their employer Columbia University) covering the use of advanced simulation techniques to value securities (Lerner, 2002: 922-924).

⁵ A senior member of the Australian patent community, now retired, remarked to me after a seminar on 7 October 2004 that “everyone [in the patent community] knew” that 5 percent of patents were very inventive, another 10 percent had something to them and the remainder were “just rubbish”. This view from one expert is generally consistent with other available evidence.

Figure 1: Hypothetical distribution of granted patents by inventiveness



There appears to be only one previous study considering the actual inventiveness of a scientifically selected set of granted patents. This is a study of 50 of the best-quality US software patents, ‘best’ being identified from forward citations.⁶ These are assessed against the obviousness standard used by the United States Patent and Trademark Office (USPTO), which the authors point out is low (Campbell-Kelly and Valduriez, 2005). The first significant finding is that all 50 inventions involve only incremental inventiveness, though only two are obvious in terms of the USPTO criteria. If the ‘best’ software patents are all only incremental, then the remainder are likely to be even more incremental. That is, they may well offer so little new knowledge or know-how that they produce no social benefits.⁷

The Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS) requires no discrimination between technology fields. While it would be a mistake to draw system-wide inferences from a single study, this sample was selected as being most likely to identify patents with high inventiveness. The finding that 4 percent are invalid and the remainder are all incremental suggests that, at least in the software field, granted patents are offering very poor social returns, if any.

This demonstration that the practical definition of inventiveness in patent law is very low suggests it might be sensible to step back from the minutiae of the legal system and ask whether currently patented inventions in fact contribute economic benefits to offset their costs. This could be done in terms of whether an ‘invention’ is likely to have been induced by the patent system. Proxies for this might be the size (‘lumpiness’) of the research and development (R&D) investment and realistic time in the market before effective imitation (Boldrin and Levine, 2004). The approach of using R&D investment scale as a proxy for ‘benefit to the nation’ would be TRIPS-compliant.⁸

An alternative approach, also TRIPS-compliant, would be a requirement that there be a reasonable contribution to knowledge or know-how. The likelihood of dynamic growth

⁶ In subsequent software patent applications. Software is based on IPC Class G06F (for all USPTO grants in the period 19760-2000).

⁷ As recently as 1994 this view (that software patents are likely to involve only incremental innovation) was thought to mean that they would not meet USPTO patentability standards (Samuelson et al., 1994). Other authors also comment on the extremely trivial nature of software patents (e.g. Pilch, 2003).

⁸ Lunney (2001) also considers an investment cost approach to try to approximate induced inventions.

benefits and/or knowledge spillovers is far greater where new knowledge or know-how is contributed. This is the approach taken in this study. A small universe of recently granted Australian business method patents were assessed against the yardstick of their contribution to new knowledge or know-how. No such contributions could be found.

The large US literature suggests the USPTO non-obviousness requirement is now set at a very low level. There are some knowledgeable commentators who consider the height of the inventive step in Australia is even lower (IPCRC, 2000: 156). IPAustralia drew the attention of the National Innovation Review to the Australian High Court's view that the inventiveness standard in Australia is particularly low (Cutler et al., 2008:52). Nonetheless, when one compares the specific rules operating in Australia with those operating in the USA, the differences appear to be marginal. Within the study reported here there are cases where overseas jurisdictions have accepted or refused patents granted in Australia, throwing some light on jurisdictional variations.

METHODOLOGY

Patents are very diverse in character. Unless the set examined is large, there is a reasonable chance that the examined set will be unrepresentative. The methodology used here was to 'construe' the patent specification to determine the essence of the invention, then assess whether this contained any new knowledge or know-how. No artificial rules were used to constrain this judgement. The simple issue was 'is there any evidence that the invention contributes new knowledge or know-how as at the priority date'?

The methodology thus involved a careful reading of patent specifications together with correspondence between the applicant and the examiner. Reading patent claims is both tedious and time-consuming: the average number of claims in the selected dataset is 30, with a range from four to 115.⁹ A balance thus had to be drawn between a sufficiently large dataset from which to be able to generalise, and a sufficiently small set to be manageable.

Another important criterion was recency, because of the higher risk of missing known knowledge at older priority dates. The dataset used is the universe of Australian business method patents accepted or sealed by 30 June 2007 from filings in 2003-06. This identified 72 business method patents, of which 13 had priority dates in 2000 or earlier.¹⁰

While the selected set is a *universe* of recently granted cases, it is only a universe at a specific point in time. Applicants can significantly influence the processing speed of their application: asking for expedited examination, or waiting until directed to request examination. They can respond quickly or slowly to adverse examiner's reports, with up to 21 months to resolve objections. This set of 72 cases is clearly unrepresentative in the speed of processing. Those

⁹ This is far in excess of average claims, at least for US patents. Average claims in US patents increased from 9.9 in the mid-1970s to 14.9 in the mid-1990s (Allison and Lemley, 2002).

¹⁰ There were 94 granted standard patents in either IPC7 class G06F/17/60 or IPC8 class G06Q (excluding G06Q/20/00) in this period. Twenty-one were excluded as not being business method patents, including 18 from Silverbrook Research, a printer manufacturer (with titles such as "Method and system for providing insurance services" and "A method for accessing travel services", but related to the company's core printer technology). A 22nd patent was excluded because it is a patent of addition whose great-grandparent was also in the dataset—clearly not an independent case. For further details see Moir, 2008.

patents which are granted quickly have generally been pushed through the system by their owners, probably because they are seen as more valuable.¹¹

The dataset is also unrepresentative in that 54 percent are owned by Australians, compared to eight percent among all Australian patent grants. The dataset also over-represents individuals: 18 percent in the dataset compared to eight percent overall. There seems no reason to expect that the degree of inventiveness to be related to any of these characteristics, unless it is considered that individuals develop less inventive inventions than companies.

One might expect that less inventive inventions would only be patented in the country of origin, while the owners of more inventive inventions would also seek monopolies in other markets (Bosworth, Filiou and Longlans, 2003). Among the 72 cases, there were eight where there is no evidence that any overseas application was ever lodged, and two with parallel applications only in New Zealand. In these ten cases (all Australian owned) the owners did not consider the invention merited wider patenting. But in another 28 Australian cases, 23 became Patent Cooperation Treaty (PCT) applications; one has non-PCT applications in the USA and at the European Patent Office (EPO) and four applied overseas but only in the USA. This suggests that for the large majority of Australian owned patents in the dataset the owners considered them to have sufficient value to be worth patenting in major overseas markets.

FINDINGS

Presenting qualitative data effectively and efficiently is always a challenge. None of the 72 cases investigated were found to make any contribution to knowledge or know-how. A discussion of the 'inventive' element in 72 uninventive inventions does not make the most exciting reading.¹² The discussion here is organised in terms of the bases on which the patent was granted, and illustrative cases are used to demonstrate these. This provides some insights into which aspects of the detailed decision making rules are responsible for allowing uninventive applications through to grant. These insights can be tested for whether they have parallels in other technology classes. They also allow comparisons across jurisdictions. For 18 cases a patent has been granted either by the USPTO, the EPO or the UK Patent Office.

Identifying existing knowledge

The first issue is whether the grant of monopolies to uninventive inventions occurs simply because of problems identifying existing knowledge. Both the 1966 US President's Commission on the Patent System and the 1984 Australian Industrial Property Advisory Committee report included this issue among their major reasons for recommending against software patenting (IPAC, 1984; Samuelson et al., 1994). This issue forms a large part of the voluminous business method patent literature (Hunter, 2004). Proposals for improved opposition hearings (e.g. Merges, 1999) or for peer review (Noveck, 2006) are also implicitly directed to this problem. EPO oppositions lead to high rates of revocation (36 percent generally and 42 percent for business method patents), suggesting a widespread problem in the identification of existing knowledge (Wagner, 2008).

¹¹ The dataset included 30 for which expedited examination was sought. It also included seven cases, all with priority dates well before filing dates, where a direction to request examination notice was issued. So it includes a small subset where owners preferred delayed grant.

¹² But is available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1423248.

In 26 of the 69 cases where there is information about examiners' reports,¹³ no novelty or inventiveness objections were raised. Identifying existing knowledge would thus seem a problem in over a third of cases. However in 14 of these existing knowledge, largely in the form of patent documents, was found by EPO and/or USPTO examiners and novelty and/or inventiveness objections were raised.¹⁴ This leaves 12 out of 69 cases (just over one in six) where no existing knowledge was found, despite the obviousness of the 'invention' in terms of the normal meaning of the word obvious.

Before concluding this is a straightforward problem of missing 'knowledge libraries', it is useful to look at claim complexity. Both Australian and US case law has developed a rule that combinations of elements are *deemed to be inventive* unless there is a specific written suggestion otherwise. This is regardless of how many closely equivalent artefacts or processes contain all the 'new' elements, though not in that combination. This 'suggestion' doctrine is discussed further below, but it is also related to the challenge of finding documented evidence on existing knowledge. In four of the 12 cases where no existing knowledge was found in Australia or overseas there were more than 50 claims—ranging from 62 to 115 claims.

"A system for and method of monitoring an item" (AU2003302490, priority 4 June 2003) was granted in the UK after the introduction of the 4-step patentable subject matter test.¹⁵ It is a system for storing, linking and monitoring data between producers, retailers and customers, thus allowing owners to track information about the goods they have bought. A device (which can be a radio-frequency identification (RFID) device) is attached to the item by the manufacturer. Retailers have IDs and they add customer ID through receipts. The ID information can include biometrics. The 74 claims relate to how the IDs are developed, attached, read/scanned, stored and remotely accessed. No new technical advances are identified in any aspect of the supply and management of the various ID options—it is simply an information management system, perhaps similar to the tracking systems used by post offices for registered mail over many years. It is hard to understand how the UK Patent Office determined there was a technical contribution.

"Logistics Chain Management System" (AU2003262306, filed 14 November 2003, priority 5 October 2000) monitors temperature and shocks while goods are being transported. It does not measure either temperature or shocks. It simply provides a continually up-dated database that sellers, transport providers, storage providers and buyers can access to monitor progress and conditions. The EPO found no technical solution to any technical problem, and the claims were amended to emphasise "a data logger arranged to sense data corresponding to the

¹³ In one case there was no information about examination on the file and no first report date on either online database. In the second case modified examination was requested based on a granted US patent. In a third case the examiner identified two 'inventions' and searched and examined for one. However that was the version that the applicant deleted. There is no evidence that any search or examination was done on the remaining set of claims (for a web-based process for managing national phase PCT applications).

¹⁴ Australia seems to have particularly narrow limits on existing knowledge allowable for assessing inventiveness (see, e.g. Monotti, 2007; O'Connell and Murray, 2003). In *Lockwood* the High Court held it was not necessarily reasonable to allow knowledge about mortice locks in assessing inventiveness for deadlocks.

¹⁵ The 4-step test for patentable subject matter was introduced in the UK in November 2006 after Prescott J's trenchant comment that "you are not allowed to get round the objection—that you are attempting to patent a computer program—by claiming it as a physical artefact, a mere change of form" ([2005] EWHC 1589 (Pat) at 36). The four steps are: 1) properly construe the claim; 2) identify the actual contribution; 3) ask whether it falls solely within the excluded subject matter; and 4) check whether the actual or alleged contribution is technical in nature (see <http://www.ipo.gov.uk/p-pn-subjectmatter>, accessed 27 August 2009).

predetermined condition of the goods and provide the sensed data to the data storage means”—that is a data input device. Whether this will convince the EPO that this information management system now has inventive technical features remains to be seen. Neither the USPTO nor the Australian patent office raised novelty or inventiveness objections, though a terminal disclaimer notice was lodged in the USA (to avoid the problem of double patenting).

It seems surprising that a simple linked database system can be granted a monopoly privilege. It further seems odd that patent examiners are unable to find a wide range of relevant material on which to raise novelty or inventiveness objections. However, as will be shown below, patent system decision making rules narrowly constrain examiners both in what materials they deem relevant and how they assess these. As Bagley has pointed out, in respect of the USA, ‘technology’ fields are now so tightly delimited that relevant information from closely related fields can be ruled inadmissible (Bagley, 2001). Similar rules apply in Australia—in the judgement widely held to have deemed business method patents allowable in Australia, Heerey J upheld the validity of a patent monopoly for a dynamic storage chip in a loyalty card even though all parties to the dispute agreed in court that dynamic storage was a well-known technology.¹⁶ Not, apparently, to those skilled in the ‘art’ of loyalty programs.

From this dataset the surprising finding is that existing knowledge, largely in the form of patent documentation, was found for so many of these trivial ‘inventions’. Overall, in 58 of the 69 cases there was evidence of existing closely related knowledge, often already patented.

Cases where novelty/inventiveness objections were raised.

Correspondence on these cases throws considerable light on the rules used to determine inventiveness. In the USA the Federal Trade Commission (FTC) has pointed to the "plethora of presumptions and procedures [which] tip the scales in favor of the ultimate issuance of a patent, once an application has been filed" (US FTC, 2003: 8). Similar evidence in respect of Australia emerges from the detailed study of these 43 cases. These cases demonstrate the range of decision-making rules and procedures which so constrain the patent law definition of ‘inventiveness’ that completely uninventive ‘inventions’ are regularly granted monopolies.

One of the most important of these is the ‘reverse onus of proof’. Contrary to normal regulatory practice, it is not up to the applicant to prove their ‘invention’ passes the inventiveness test. Rather it is the patent office which must demonstrate it fails. Another rule requires examiners to accept applications which combine well-known elements in new ways even if the combination is no more than the sum of the parts. A particularly insidious version of this doctrine is the simple combination of well-known methods with computers or modern electronic networks. A third issue is amendment of specifications to overcome novelty or inventiveness objections. Some such amendments seem only tangentially related to the core ‘invention’, yet suffice to pass through the monopoly granting gate. In many cases it is possible to identify only the most marginal of differences between an ‘invention’ and previous related systems and methods and if a normal definition of the word obvious were used these would not be seen as inventive. In the most extreme cases this trivial difference seems mere legal semantics. A fifth problem is failure to apply the ‘analogous use’ doctrine, which used to prevent the grant of very obvious patent monopolies. Finally there seems to be a set of cases where the monopoly grant is for an idea or the spelling out of a ‘problem’.

¹⁶ *Welcome Real Time SA v Catuity Inc* (2001) 51 IPR 327.

Reverse onus of proof

The ‘reverse onus of proof’ rule derives from Section 7 of the *Patents Act 1990*, where the statute states an assumption of novelty and inventiveness.¹⁷ In negotiations between patent attorneys and examiners, there are a number of instances where examiners use this presumption to instruct the examiner to point out where each and every element of an ‘invention’ is clearly shown in the existing knowledge base. This ‘presumption of inventiveness’ also exists in other countries: for example Section 3 of the 1977 UK *Patents Act* includes a similar statement (O’Connell and Murray, 2003: 482).

In the case of an extremely complex and detailed back-office process for checking and paying invoices,¹⁸ the Australian examiner initially rejected the application as lacking novelty and inventiveness compared to five patent documents, eBay and another internet trading system. The claims were amended, but the examiner maintained inventive step objections, commenting that “[t]he claimed invention represents *no more than a workshop modification* of the prior art” (emphasis added). Accompanying a second set of amendments the attorney argued that “*it has not been shown by the Examiner* that the addition of a payment processing system in the context of the management interface hub as disclosed in the present application, was part of common general knowledge in Australia” (emphasis added).¹⁹ A specific feature (a third party consumer) was also emphasised as a differentiating characteristic of the ‘invention’. The case was accepted within 2 weeks of receipt of this letter.

The US examiner raised novelty/inventiveness objections for "System for Confirming the Presence at Home" (AU2003204139, priority 10 May 2002), a computerised version of a conversation scheduling a delivery time. Following a second rejection advice (neither novel nor inventive, citing two US patent documents), a notice of appeal was filed. In relation to the appeal the attorney argued “[the] Examiner has failed to show that each and every element as set forth in claims 1 and 2 is found in ... Further, the Examiner has failed to make out a *prima facie* case of obviousness ...”²⁰ In the event the appeal was not followed through and the application has been abandoned. But this language suggests US examiners face a similar reverse onus of proof situation to that evident in Australia.

"Online fare booking method and system" (AU 2004202066 priority 17 March 2004) handles queries for air travel, including varying numbers of passengers. It checks enquiries against travel databases. The potential traveller is offered available options around the desired date as

¹⁷ Section 7(2) states “... *an invention is to be taken to involve an inventive step when compared with the prior art base unless the invention would have been obvious to a person skilled in the relevant art in the light of the common general knowledge as it existed in the patent area before the priority date of the relevant claim, whether that knowledge is considered separately or together with the information mentioned in subsection (3).*” (emphasis added). A similar provision is spelled out in Section 7(1) with respect to novelty (see http://www.austlii.edu.au/au/legis/cth/consol_act/pa1990109/s7.html). The decision-making rule was changed from ‘benefit of the doubt’ to ‘balance of probabilities’ in 2001 amendments. But in the 72 cases studied here, Attorneys regularly argue that the examiner has not demonstrated lack of inventiveness and examiners do not refer to the balance of probabilities rule.

¹⁸ “System for Ordering, Tracking and Payment of Goods and Services” (AU2003200960, priority 18 September 2002) has 68 complex claims, though this includes one version for a “management interface hub” and a repetition for a “method for the procurement for goods and services”.

¹⁹ The Australian Patent Manual (2.5.2.1.3) cites *General Tire & Rubber Company v Firestone Tyre and Rubber Company Ltd* ((1972) RPC 457) to state that published knowledge cannot be assumed to be common general knowledge in Australia (<http://www.ipaustralia.gov.au/resources/manuals.shtml>).

²⁰ US application 10/434276, pre-brief conference request of 29 April 2008, p. 2.

well as fare options. The system prints a travel document and/or a receipt. This was naturally rejected for want of novelty or inventiveness. The surprise was that this rejection was based on only one US patent document (6,304,850, Keller et al.).²¹ The attorney's response illustrates the very minute differences that suffice for grant of a patent monopoly:

- "(1) Keller teaches how a *fare availability search* can be conducted, whereas the present invention goes beyond this by combining a *fare search* with an *availability search*.
- (2) Keller requires the *user to enter a target price* for the booking, whereas the present invention *provides a list of possible fares ...*
- (3) The fare search phase in the present invention is conducted *over an extended time period* that is larger than the time period specified by the user ..." (emphasis added).

The attorney also argued that "*the Examiner has provided no evidence* that a skilled address[ee] could have ascertained, understood and regarded as relevant US patent documents, and in particular the Keller reference" (emphasis added).

Although most cases do not involve such clear statements of this rule, it will become evident from the material below that the degree of inventiveness in this dataset is so very low that if the onus of proof lay with the applicant these monopolies would not have been granted. It is here worth noting the very different views which economists and lawyers take to the standard of proof. Lawyers consider that a 'beyond reasonable doubt' test is appropriate only in criminal matters and thus is not appropriate for patents—a civil matter. However, competition principles suggest that where there will be a competition-reducing intervention in a market, there should be a clear demonstration that the intervention will increase general welfare.²² This principle is not only economically sound but it also supports democratic principles in ensuring that special interests are unable to influence rules for their personal benefit unless there is also a benefit to the nation. This is, of course, a 'beyond reasonable doubt' standard.

Combinations (including mere computerisation)

A second rule which is important in allowing the grant of many obvious 'inventions' is the prohibition on finding that a marginally different combination of characteristics in an 'invention' is obvious. Thus where there are many closely related artefacts, between them exhibiting a range of characteristics (integers), it is not deemed obvious to select a set of characteristics that have not previously been combined. For such an 'invention' to be deemed obvious, the idea of combining exactly those characteristics must be written down.²³ This doctrine (policy) was introduced in the USA in 1984,²⁴ where it is known as the 'suggestion' doctrine (Lunney, 2004: 21). In Australia it derives from a 1980 High Court decision,²⁵ warning against the straightforward rejection of combinations:

²¹ I clearly recollect sitting in an internet café in Thessaloniki in February 2001 and being offered both date and fare options by Easyjet. Naturally I was also able to determine the number of passengers, and was given a booking reference number for check-in. This is over 3 years before the priority date of this 'invention'.

²² Clause 5.1 in the Australian Federal-State Competition Principles Agreement requires clear demonstration that benefits to the community outweigh costs: "The guiding principle is that legislation (...) should not restrict competition *unless it can be demonstrated* that: the benefits of the restriction to the community as a whole outweigh the costs" <http://www.ncc.gov.au/pdf/CPAam-001.pdf> (emphasis added).

²³ There is not a large market for written documentation of the obvious (see, e.g. Ullman, 2000).

²⁴ *ACS Hospital Sys, Inc*, 732 F2d at 1577.

²⁵ Cited in Australian Patent Manual, 2.5.3.5 (see <http://www.ipaustralia.gov.au/resources/manuals.shtml>).

“The proper question is ... whether it would have been obvious to a *non-inventive* skilled worker in the field to select ... *the particular combination* subsequently chosen by the opponent *in the glare of hindsight* ... The prior existence of publications revealing those integers ... *does not of itself* make an alleged invention obvious. It is the *selection of the integers ... which must be shown to be obvious. ...*”

(*Minnesota Mining and Manufacturing v Beiersdorf* (1980) 144 CLR 253 at 293, emphasis added).

In both the USA and Australia the prohibition on rejecting obvious combinations in a straight-forward manner increases the risk of granting ‘bad’ patents. As long as patent processing is allowed to take years, hindsight will be a problem. But this does not mean that patent systems should err towards granting ‘bad’ rather than refusing ‘good’ patents. There are sound economic reasons to err on the side of refusal of a ‘good’ patent (Jensen and Webster, 2004; Dreyfuss, 2008). Erring towards the refusal of ‘good’ patents places the costs of review squarely on the shoulders of the party seeking the monopoly grant, rather than an innovative firm not a party to the original decision.²⁶ The older ‘synergism’ doctrine required a combination patent to produce a new and inventive result. At a minimum it had to produce a result that was greater than the sum of its parts.

"Automated receiving and delivery system and method" (AU2003262357, filed 19 November 2003, priority 9 November 1999) claims both computerised and manual versions of a system for scheduling deliveries into sections of a container with an electronic lock. The claims set out the steps that would be required to perform such an operation. Several well-known elements are combined: traditional delivery systems, sending electronic signals and confirming that delivery has been made. This case also illustrates an issue discussed further below—the applicant sets up a ‘problem’ and then provides a ‘solution’. Some such ‘problems’ are extremely trivial. In others, as here, once the ‘problem’ is identified the solution is quite straight-forward, requiring only logic and an understanding of process.

This case also demonstrates the capacity of patent offices to perceive multiple inventions where an ordinary person can see none. Here the Australian examiner expressed concern that there was more than one invention (checking for space *and* sending a delivery made advice). The EPO examiner also found two ‘inventions’—a time scheduler for delivery and a system dependent on the size of items being delivered. Following deletion of the second set of claims (with the right to a divisional reserved) the EPO granted the patent. The EPO considered the problem addressed was managing a delivery system for scheduling the time of deliveries, and that the proposed solution involves an inventive step as no previous documents teach “identifying, using the scheduler, a first time interval during which the first delivery can be made and accessing the first locked storage container only during the first time interval.” The examiner went on to comment “[t]he skill [sic] man would not derive these features from the available prior art, nor would he combine these documents to arrive at the solution of the invention.”²⁷ Quite how the EPO determined that there was a *technical* problem to overcome

²⁶ Not an issue properly considered by Lemley (2001), who *assumes* few patents are actually used. In fact the limited evidence on patent use suggests that the majority of patents are used (see Moir, 2009). Lemley’s proposal—effectively that all validity testing be in the courts—would impose substantial costs on other innovating firms, as Bessen and Meurer (2008) point out.

²⁷ EP application 00977142.0, report of 11 July 2005, p. 3. The ‘prior art’ identified two documents and the examiner advised that the elements of delivering to multiple locked containers, delivering goods to customers, delivering to locked containers and sending delivery made signals were not novel.

is unclear from the documentation. Perhaps the business process of delivery became technical because of the electronic lock?

"Payment card processing system and methods" (AU2003262344, priority 5 September 2003) is a system for reducing the number of plastic cards one carries by combining a normal credit card and a store-specific card. In responding to the examiner's rejection in the light of four US patent documents the attorney argued this existing knowledge *allow[ed] for multiple accounts* rather than a *single account* on a *multi-use card*; that none *specifically combined a store card and a credit card*, even though they loaded a range of functions and accounts onto a single card; and that *specific details were not 'taught' in the prior art*. These specific details were an upgrade process for converting current store cards to dual cards; migration of data; in-store issuance of a card; and activation on customer request. All these are, of course, very well-known processes. However because the examiner was unable to find written evidence of the exact combination, the patent monopoly was granted. This 'invention' has also been granted a patent monopoly in the USA.²⁸

Cases where the combination takes the form of mere computerisation are extremely obvious. Examples are computerisation of: the mental steps involved in valuing a property,²⁹ writing a sales contract for copyrighted goods,³⁰ managing an internet advertising campaign,³¹ the mental steps involved in implementing contractual obligations³² and an expert medical system.³³ In the latter the claims were amended twice before being accepted. The first amendment reduced the scope of the claims from all medical data to data on peritoneal dialysis. Following the second rejection the applicant amended the claims by limiting them to *a system with a server giving a warning message, then reverting to stand-by mode* after sending the data. In arguing that the 'invention' now differed from previous patents, the attorney emphasised these *did not include a server reverting to stand-by mode*. The case was accepted within a week of receipt of this response.

A well-known problem in patent systems is that language can be narrowly construed in determining grant but subsequently broadly construed in litigation. In this case the limitation appears towards the end of the rather lengthy first claim. Whether this would in fact operate to constrain the monopoly to situations with this server standby feature would be highly dependent on court interpretation.

Australia is perhaps unique in accepting that simple computerisation is inventive. This policy was created by the Full Federal Court in 1994, when considering computerisation of a well-

²⁸ However as the file wrapper is missing for 09/593199, it is not possible to see the content of the single non-final rejection that was issued prior to grant.

²⁹ "A method for performing an asset valuation" (AU2005203023, priority 12 July 2005). Granted after minor amendment and argument that valuers often cut corners and failed to keep proper records.

³⁰ "System and method for granting access to an item or permission to use an item based on configurable conditions" (AU2003290930 priority 18 November 2002). No examiner objections in Australia, but the USPTO has rejected this application and an appeal is pending.

³¹ "Automatic Flight Management in an Online Marketplace" (AU2003200436, priority date 8 February 2002). After rejection on novelty grounds the claims were replaced by those from US patent 7,231,358. While the formal databases indicate either withdrawn or refused in the UK, material on the Australian file indicates that the UK Patent Office advised this invention was not patentable subject matter.

³² "Distributed Transaction Event Matching" (AU2003204278, priority 21 May 2002). The claims were amended and the patent was granted.

³³ "Medical data warning notifying system and method" (AU2003281184, priority 15 July 2002).

known linguistic technique applied to writing Chinese characters.³⁴ The court based its decision on pre- European Patent Convention (EPC) UK legal reasoning:

“that *more than a mental process* was involved in claiming the process of application of certain steps represented by a computer program on a standard computer, *since the method as claimed was incorporated in the program and in apparatus in a physical form.*”

(van Caenegem, 2002: 46, emphasis added)

This is startling reasoning. Certainly there is a mental process involved in computerisation. It is very similar to translation from one language to another, except that here the language is a computer language. But it is completely unclear what the ‘more’ is. It is in the nature of software that it operates in a computer. The reasoning appears to be that when software actually runs in a computer it attains a physical form and so (at least while operating) ceases to be software. The extraordinary legal semantics involved here is also demonstrated in many specific patent negotiations where very trivial differences in words form the basis of patentability. This is discussed further below. The result of this decision is that in Australia software itself is patentable, whereas in other jurisdictions claims to software have to be drafted to pretend they are not software.

Amendments

Related to the ‘combinations’ doctrine is the frequent amendment of claims to ensure that the *exact combination of characteristics* identified by the examiner is avoided. In its ultimate form this strategy can include withdrawal of an application that is about to be rejected once a ‘divisional’ has been filed, thus setting up a new opportunity to refine the wording.³⁵ The ability to amend specifications during the processing stage was introduced in Australia in the *Patents Act 1952*. There was no substantive discussion during the parliamentary debate, and this change seems never to have been evaluated. Yet it is clear from the cases investigated here that the ability to continually amend claims and specifications leads to a substantial under-mining of the overall goals of the patent system. This policy is overdue for evaluation.

"Management control of pharmaceutical substances" (AU2004211006, priority 11 February 2003) is a computerised system for supplying pharmaceuticals from a distance and revolves round checking the patient’s identity and prescription and ensuring sufficient time elapses between sending secure ID and receiving it. The ID involves biometric capture, but the ‘invention’ is neither about the biometrics nor their capture, simply their transmission and assessment. The applicant asked for expedited examination, due to concerns about possible infringement. If other parties were actively developing similar ‘inventions’, this strongly suggests obviousness. The examiner raised novelty and obviousness objections citing one patent and four non-patent documents. The applicant then amended the claims, bringing

³⁴ *CCOM Pty Ltd v Jiejing Pty Ltd* (1994) 27 IPR 577; (1994) 28 IPR 481. While legal experts consider this a ‘subject matter’ decision, from an economic policy perspective it clearly reduces the inventive step by allowing the mere computerisation of well-known methods to be granted patent monopolies.

³⁵ AU2003244578, filed 28 August 2003, priority 23 October 2000 ("System and method of attracting and lodging PCT national phase applications (II)") was possibly never examined in Australia. The Australian examiner identified two ‘inventions’ and searched and examined for one, which was rejected as being neither novel nor inventive—in fact only common business practice in attorney firms. However that was the version that the applicant deleted. There is no evidence that any search or examination was done on the remaining (closely similar) set of claims. In its EPO version (publication EP1340174) advice of an oral hearing was issued in June 2008, and it was clear from this that it would be most unlikely the application would be granted. The applicant responded by filing a Divisional and withdrawing the parent.

subsidiary matters into the main claims and arguing that the new specific arrangement was not disclosed in the evidence found by the examiner. The patent was granted.

While this is a mere combination of known processes, it was the amendments, with narrow semantic differences from the closely similar processes which led to grant. The USPTO has recently issued a first report objecting that the application is indefinite and obvious compared to two US patent documents. The EPO examiner identified a documented computerised ID matching system for pharmaceutical supply, incorporating biometric records, and argued that the claimed ‘invention’ differed only in the features of *secure communication* between the biometric capture apparatus and the management computer, which were in fact disclosed in a second document. The applicant then amended the claims to emphasise *that the stored data records are logically separate from the biometric records* and argued this made the ‘invention’ eligible for a patent because *‘the fact that a number of individual features were well known does not conclusively show the obviousness of a combination’* and that the document on secure communication *does not disclose logical separation of the two sets of records*. The EPO disagreed, and the response provides two interesting insights.³⁶ Firstly in rejecting the three minor differences from existing knowledge as being inventive, the examiner notes that “... no combined *synergistic* effect is produced ... Hence the combination of these three features amounts to a *mere aggregation* which is obvious ...” (emphasis added). This clearly sets out a marked difference between EPO and Australian/US procedures in respect of combinations—the EPO continues with the traditional ‘synergism’ approach which has been abandoned in Australia and the USA. Secondly, the reply contains an interesting comment on how the ‘technical’ effect works: “the objective technical problem might be regarded as that of how to implement the proposed administrative scheme”. This implies that while an administrative scheme is non-technical, its implementation can be technical (though in this case is obvious). Given that software and business methods are both excluded subject matter under the EPC, it is hard to see how software implementation of a business method can become patentable by acquiring ‘technicality’.

There were no novelty or inventiveness objections to "On-line interactive system and method for transacting business" (AU 2003231594, filed 1 August 2003, priority 6 July 1999) in Australia, but the USPTO rejected it four times. The essence of this on-line method for buying, selling and transporting goods is reserving the goods when a purchase request made. The buyer’s credit rating is then checked and the goods are either sold and shipped or returned to inventory, depending on the outcome of the credit check. It was effectively refused by the EPO, though the applicant argued that it delivered a ‘technical’ advance to the ‘technical’ problem of reducing ordering times. The EPO considered any time saving was a business objective and that there was nothing inventive in the ‘technical’ (software) implementation. The application was withdrawn following a summons to oral proceedings. It has been refused in Korea and granted in the USA, Russia and New Zealand. In finally accepting this ‘invention’ the US examiner said “... none of the art of record, alone or in combination, disclose that *the freight carrier*, in a trade transaction, that ships the goods to the buyer *is also playing the role of a financial facilitator* ...” (emphasis added). This remarkably trivial variation was added as an amendment.

³⁶ Publication number EP1593073, annex to the Examining Division’s communication of 8 October 2008, paragraphs 2.5 and 2.6 (page 5).

As noted above in 43 out of 72 cases the examiner raised novelty or inventiveness objections. In 50 cases the claims were amended at least once. In 22 cases claims were amended more than once—three applicants amended claims six times. Many of these amendments are marginal word variations—adding little to the ‘invention’. Sometimes they are quite unrelated to the core ‘inventive’ idea, for example the expert medical system where the server reverts to standby mode. In a few cases the amendments reduce the scope of the claim, and it is this scope reduction which permits the patent grant. Whether this reduces the effective impact, either in putting other innovators off working in the area, or in seeking royalties is another matter. It should not be assumed that the fact that a patented invention is either obvious or narrow will prevent a company from using it to gain royalties. The *Welcome Real-Time v Catuity* case, discussed above, placed real and substantial costs on Catuity, even though it had independently invented its own system, using the well-known dynamic storage technique.

Trivial difference instead of inventiveness

Indeed patent law now seems to accept ‘trivially different’ as meeting the statutory requirement for ‘inventiveness’. Extremely small differences between one ‘invention’ and another suffice for a monopoly grant. In its extreme form this often seems mere semantics where words with closely similar meanings in a given context are argued to be different—for example ‘benefit’ and ‘reward’ in the context of bank accounts (discussed below).

"Dynamic Collaboration Assistant (AU2003264604, priority 19 March 2003) provides access to shared and/or team systems such as chat rooms, mail, message lists and corporate documents. A ‘knowledge module’ lists all individuals, work groups, files and other documents. The location (‘context’) of the terminal determines the options offered, via the ‘knowledge module’ (effectively a cross-classified directory). The examiner rejected the application twice, initially commenting that it was simply “inessential adaptations of the cited prior art”. In the first set of amendments the applicant stressed the *context of terminal use* as a key feature. This involved minor modifications to most of the 42 claims, and the addition of two new claims. In response to the second rejection the applicant *successfully argued that it was unreasonable to interpret two previous documents as being based on the context of the terminal as they only used keywords and document lists to adjust displays*. A patent has also been granted in the USA, but has been refused by the EPO. In the USA five rejection advices were issued before the amendments finally met with the examiner’s agreement. The EPO first rejected the application on novelty and inventive step grounds—no subject matter problems were raised. Following formal rejection, intent to appeal has been notified.

"Automated Price Improvement Protocol Processor" (AU2004222811, filed 22 October 2004, priority 18 December 1998) is a computerised auction system for trading financial instruments such as fixed interest securities. It follows the normal pattern of allowing bids to be revised and providing a fixed period of time for those closest to closing a bid to negotiate. In rejecting the application for want of inventiveness the examiner drew the applicant's attention to narrower claims of the granted US patent. The original claims were withdrawn and replaced with the US version. At best this is a combination of old ideas; it could also be classified as a very trivial variation. Computerised auction systems were not new in 1998: as the EPO pointed out in examining this patent’s parent, electronic trading systems with

hierarchical management and execution of orders were widely known.³⁷ This patent belongs to two closely related families, the other being for an "automated auction protocol processor". The US version which was adopted as the Australian version was rejected three times before grant, so clearly inventiveness issues were raised by the USPTO examiner too.³⁸

There were no Australian examiner objections to "System and method for conducting online auctions" (AU2003206509, priority 7 March 2002), but the USPTO had considerable problems with it. This is another case where patent offices are able to divide uninventive applications into more than one 'inventive' element.³⁹ This system allows the selection of suppliers from a predetermined panel using an on-line reverse auction process. It combines the well-known method of pre-qualifying suppliers in an approved panel arrangement with the equally well-known process of an auction process. It is dependent on the capacity of modern electronic networks to be effective as a business system. As it operates over a network it allows sharing of information on the offer that needs to be beaten with all or a sub-set of bidders. Again this is a known process. And information sharing itself is a very old idea.

In his first report the US examiner asked the applicant to provide a range of relevant material on existing knowledge, including related publications by the inventors and whether specific formulae were derived from the applicant's sole work or from others' work. He also rejected 16 claims as not patentable subject matter, and all but two as not novel. The final two were rejected as obvious. It remains pending in the USA, but has been withdrawn at the EPO.

"Method of conducting transactions over a network" (AU2004203415, filed 26 July 2004, priority 23 February 2000) uses fingerprint authentication for security. It was rejected twice on novelty and inventiveness grounds compared to a wide range of existing knowledge. The claims were substantially amended and the applicant then argued that a critical difference in this 'invention' was *the transmission of the fingerprint to a central location for matching against a database, in contrast to storing the fingerprints in the fingerprint authentication device*. While this means that only the authentication data need to be transmitted, it is also like arguing that because something occurs at a different location it is inventive.⁴⁰

Despite this very trivial difference, this 'invention' has been granted monopolies in the USA, the UK and at the EPO. The EPO initially rejected it as no technical problem was solved. The claims were redrafted by deleting claim 2, that the fingerprints were encrypted, and incorporating this feature into claim 1.⁴¹ Although the examiner had considered that the 'invention' involved used of technical means (a networked computer and a fingerprint identification device) to solve a business problem (authorisation of commercial transactions), this simple amendment led to grant of the patent. The applicant argued that the previous

³⁷ Following this comment the applicant withdrew the 128 claims and replaced them with two focusing on 'the technical features of the computer system', and minimising reference to business features. The applicant was summoned to an oral hearing but did not reply and the application has been deemed withdrawn.

³⁸ The usual 'file wrapper' for this patent is not shown on Public PAIR so the examiner's reports cannot be accessed. The transaction history identifies three rejections, so amendments are likely.

³⁹ The US examiner identified two embodiments (one with a reverse auction, controlled by the buyer, another with a normal auction, controlled by seller). The applicant selected restricted to the reverse auction.

⁴⁰ Rather like another case in the dataset "Mobile report capture" (AU2003246060, priority 12 September 2003) where the critical difference from the existing knowledge is "generation of the report *at the remote site*" as compared to "generation of the report *on a server, following data collection at the remote site*." This case has been rejected in the USA on novelty grounds so may be invalid in Australia.

⁴¹ Three other claims were deleted, claims were renumbered, and a parallel change was made to the independent claim now numbered 19. See publication number EP1257952, communications of 26 June 2006.

identified knowledge did not hint at storing the fingerprint in encrypted form, and that this is a technical feature. The EPO then granted the patent. One notes that the claims do not cover encrypted storage of the fingerprint. They simply claim a (software) process for using the device to authorise access to a range of commercial transactions. It is unfortunate that the EPO, unlike the USPTO, is not required to publicly justify its reasons for allowing grant of a monopoly. In this case it is hard to understand how moving nine words from claim 2 into claim 1 suddenly makes this a ‘technical’ invention.

“Integrated financial service product” (AU2005204292, priority 26 August 2005) is an ‘invention’ combining a loan and a credit card account (with a single loan limit) with any other Westpac product. There are rewards for moving money between the two loan accounts. In responding to the examiner’s initial rejection on novelty and inventiveness grounds the attorney argued that ‘none of the cited documents discloses *each and every one* of the essential features of the present application ... there is no anticipation and the invention as claimed is novel’ (emphasis added). The single feature cited is apportioning the credit limit between the loan and the credit card accounts. Under current Australian law this small variation does indeed make this ‘invention’ novel, confirming the uselessness of the novelty criterion in ensuring there is any public benefit in exchange for the monopoly. The examiner withdrew novelty objections but maintained inventiveness objections, particularly in relation to a similar product (Viridian) produced by the Commonwealth bank.

In their lengthy reply to this second rejection, Westpac’s attorney presented a detailed comparison with the Viridian product. This depended heavily on extremely narrow readings of the meaning of specific features: for example the fact that customers *can* link credit cards to the Viridian product, but that they are not part of the Viridian product *per se*; that Viridian’s reduced loan debt *benefit* is not a *reward* as there is no ‘reward currency’ or ‘reward program rules’. These arguments successfully overcame the examiner’s objections.

These examples illustrate the extremely trivial variations that are sufficient to obtain a government sanctioned monopoly in Australia. They also show that both the USPTO and the EPO grant monopolies for equally trivial variations. At the EPO this is complicated by the random insertion of the very indefinite ‘technical’ criterion. If EPO statements allowing grant set out the basis for that decision, especially the basis for any ‘technical’ determination, this would assist in understanding why particular monopoly grants are seen as welfare-enhancing.

Failure to apply the ‘analogous use’ rule

Failure to use the ‘analogous use’ principle for processes also allows grant of obvious patents. This doctrine exists to reject grossly uninventive applications. However, in Australia it is not used to reject process applications where extremely well-known methodologies (such as audit or benchmarking) are used in narrowly different fields where their use is entirely suitable.

“Method and Tool for Assessing the Sustainability of a Development” (AU2004200942, priority 7 March 2003) simply benchmarks sustainability in property developments. Benchmarking was very popular in the 1990s in Australia—it was used to monitor micro-economic reform.⁴² Like audit, financial ratios, expert systems and general ledger codes, benchmarking is a widely known and used technique. Here the applicant successfully argued that because the cited existing knowledge was used in respect of operational efficiencies in a

⁴² The BIE’s *International Benchmarking Overview* 1995 report, for example, is available at http://www.pc.gov.au/__data/assets/pdf_file/0003/5808/95-20.pdf.

firm, not assessing the sustainability of a property development. Given the objective of measuring the sustainability of proposed developments, the only possible alternative approach would have been some form of checklist, producing an inferior result to benchmarking.

"A system for validation of chemical usage in the production of foodstuffs" is simply a standard audit process applied to the presence of chemicals in foodstuffs.⁴³ The examiner found three patent documents and a conference paper relating to the audit of chemicals. The applicant argued that these did not cover the full supply chain, as they commenced tracking only at the farm. At the same time the claims were narrowed from auditing chemicals in materials to auditing chemicals in foodstuffs. The patent was then granted. Again there was no use of the analogous use policy despite the clear suitability of this very old and well-known technique—indeed it appears that this is only one of many patent monopolies using this technique in this specific field.

To the extent that modern electronic networks are an enabling technology, the combination of old methods with modern networks is a close parallel to analogous use. Modern networks are readily and easily adapted to most business methods and provide firms with new powers to reach much wider markets.

"An Identification Card Production and Distribution Method" (AU2004201620, priority 20 April 2004) is exactly such an 'invention'. It is a process for the remote ordering, checking and acceptance of goods such as ID cards. It was rejected twice on novelty and inventiveness grounds, and the claims were amended on both occasions. Nothing in these amendments changed the nature of the 'invention', which is the straightforward use of traditional ordering, checking and paying processes over a network.

None of these three applications have overseas counterparts, so it is not possible to see whether other jurisdictions are dealing with issues on analogous use in a similar manner. Software and business method 'inventions' essentially involve processes not products. It appears that because the doctrine was initially specified as applying to 'things' not 'processes' it is not used for processes, despite the clear analogy. Yet is it clear from the doctrine that it was designed precisely to avoid granting monopolies to such obvious 'inventions'. As the Australian High Court expressed it in 1959:

"If stainless steel and its properties were known, and many kinds of articles had been made of it, it would not be possible for a man to claim a monopoly for making kitchen sinks of stainless steel merely because he was the first man who ever thought of doing this. ... *It is not an inventive idea for which a monopoly can be claimed to take a substance which is known and used for the making of various articles, and to make out of it an article for which its known properties make it suitable, although it has not been used to make that article before.*

(1959) 102 CLR 232, 248 and 249 (emphasis added)⁴⁴

Ideas and 'problem' identification

There has been a longstanding tradition that ideas themselves are not patentable, so that if there is only one means to implement an idea, then a patent monopoly will not be granted.⁴⁵

⁴³ AU2004233489, priority 26 November 2004. The one non-standard feature is subsidiary claim 12 requiring the auditor to be employed by a chemical company (i.e. not independent).

⁴⁴ *Commissioner of Patents v Microcell Ltd*. The principle dates from an 1838 English case, re-confirmed by the British Lord Chancellor in 1965 (Brennan and Christie, 1997).

This is an important policy rule and acts to ensure that knowledge remains in the public domain even while specific uses of it are appropriated to the private domain. There is some uncertainty as to whether this doctrine applies in Australia. In *NRDC* the High Court upheld a patent where the inventiveness lay exclusively in the idea. More recently the High Court confirmed that the inventive element in a patentable artefact may lie simply in the idea. That case, *Lockwood v Doric*, revolved round the addition of a single element to a deadlock, and there is unlikely to have been more than one way of implementing the idea (Monotti, 2007).

This contrasts with the situation in the USA where the idea-artefact distinction may remain as an element of patent policy. In one case in the dataset, the USPTO examiner is maintaining that there is only one way to implement the idea, and that as a consequence a monopoly cannot be granted. He has challenged the applicant to demonstrate any other way of implementing a solution to the problem posed.⁴⁶ Instead of providing this information, the applicant has appealed. It will be interesting to see how this case unfolds: the patent at the heart of the *State Street Bank* case involved the computerisation of Internal Revenue Service (IRS) guidelines, and a lower court held that there was only one way to do this.⁴⁷

Kahin refers to this as patenting the problem not the solution (Kahin, 2003). There are a number of cases in this category: the other five betting cases and an email alert system. This avoids charges by sending such a quick signal that the phone does not pick up. "Email Alert Device and Method" (AU2003236451, filed 22 August 2003, priority 17 March 2000) was granted in the UK but rejected in the USA as not novel.⁴⁸ Despite the word 'device' in the title the claims are simply for a *software system* alerting users to incoming email messages without incurring phone charges. The claims are written at a very high level of generality.⁴⁹

All three companies owning betting patents in the dataset have many such applications in several major markets. Cantor Index's system for betting against the favourite (rather like short-selling)⁵⁰ raised no objections in Australia and was granted in the USA after one amendment where all 23 claims were cancelled and replaced by 17 new ones. This 'invention' was rejected in the UK but appealed. The appeal was dismissed by consent. It was refused by the EPO as the alleged technical problem of reduced data traffic could not be understood from the description and as a consequence the EPO considered that a skilled person, confronted by the desired betting strategy, would consider it a trivial task.

⁴⁵ See US Supreme Court *Rubber-Tip Pencil Co. v. Howard*, 87 U.S. 498.

⁴⁶ "Interactive Wagering Systems and Methods with Parimutuel Pool Features" (AU2004202762 priority 5 April 2000) provides gamblers with information on how a planned bet will affect the pool and the winnings in a closed pool betting system. No objections were raised in Australia. The US examiner identified three (very old) US patents and a set of gambling regulations from Nevada. The EPO considers the 'invention' to be technical as it is implemented on a computer, but sees no inventive step—modifying a well-known interactive wagering system to simulate the placing of a bet would not require any inventive skills.

⁴⁷ While the *In re Bilski en banc* decision (88 USPQ 2d 1385 CAFC (2008)) suggests that even the CAFC no longer considers *State Street Bank* good law, *Bilski* has been appealed to the Supreme Court and a final decision remains pending. The Signature patent at the heart of the *State Street Bank* case is simple computerisation of IRS guidelines (Stern, 1999: Appendix A).

⁴⁸ In the USA the 4th rejection identified, for the first time, US patent 6,243,739 filed on 22 December 1997. This suggests the granted patent is invalid in both the UK and Australia.

⁴⁹ The 74 claims repeat through 'an indicating device', a system, a method, and a 'computer program product' version.

⁵⁰ "System and method for betting on a subset of participants in an event" (AU2003252947, 3 April 2003).

Cantor's second betting patent ("System and method for generating customized odds bets for an event" (AU2003257910 priority 1 July 2003) calculates odds for combined event outcomes, such as quinellas and trifectas. It was rejected twice. Given the longstanding and ubiquitous presence of quinella and trifecta bets in Australia,⁵¹ it is odd that it was not resisted more strongly. This patent has been rejected in the UK as being excluded subject matter. In the USA Cantor has gone straight to an appeal after just two rejections.

These cases suggest that setting up a trivial problem and then providing a solution to it is another method of acquiring a monopoly grant. These 'inventions' are inexpensive to produce and there does not appear to be any market impediment to their production, nor any benefit to the nation from the monopoly grant. Again these cases illustrate that in the search for 'objective' criteria of what is obvious, the system as a whole seems to have lost sight of the overall purpose: to increase economic well-being.

Insights into USPTO / EPO treatment of computer software

All but one of the 72 cases involve software,⁵² though three others claim both software and manual versions. The Australian approach to computerisation 'inventions' differs from that in the USA and at the EPO in that no pretence that software is not software is required. In both the USA and at the EPO software is not patentable, unless claims are worded to pretend that software is not software.

The overseas cases strongly suggest that the USA, like Australia, grants patent monopolies for trivial difference, not inventiveness. The evidence at the EPO is less clear: the synergy policy ensures a higher inventive step for combinations. However most refused business method applications are not refused on inventiveness grounds but for want of a 'technical' effect. The three cases where the EPO has granted a patent seem equally uninventive, and are simply for software systems, yet both a 'technical effect' and inventiveness have been discerned.

The EPO has been able to reject a number of the mere computerisation 'inventions' on the basis of its 'technical'/non-technical distinction. 'Inventions' rejected on these grounds include SAP's "Method and system for risk evaluation";⁵³ Accenture's "Change navigation toolkit";⁵⁴ "On-line interactive system and method for transacting business" (see p. 21 above) and "Service points liquidation system".⁵⁵ On the other hand it has granted a patent for a

⁵¹ A quinella is a joint bet on the first two places in a race and a quinella is a bet on the first three. These can specify the order or be a 'boxed' (any order) combination.

⁵² "A Financial Education System" (AU2003203582, priority 8 April 2003) teaches children about finance by working for their pocket money. It includes insurance, credit (advances) and investment options.

⁵³ AU 2003200483, priority 13 February 2002, accepted in Australia without discussion, assigns risks, threat levels and associated probabilities to a set of measures relevant to strategic business planning. It then calculates an aggregate risk-weighted score for the business. The USPTO initially rejected it as neither patentable subject matter, nor novel. The claims were cancelled and replaced. A second rejection maintained the objections on subject matter, novelty and obviousness grounds. It remains pending at the USPTO.

⁵⁴ AU2003255356, priority 1 August 2002. This 72-claim 'invention' for computerised implementation of large new software systems was accepted without comment. It is pending at the EPO but there is a clear indication that it will be refused as non-technical. Accenture Global Services GmbH amended the claims, but the call to an oral hearing cites three patent documents as providing evidence that this is common general knowledge and refusal seems likely. The EPO, however, "agrees with the applicant in that the various steps of the claimed method are not business methods as such." This conclusion seems inconsistent with the content of the claims.

⁵⁵ AU2003280529, priority 29 November 2002, converts used tickets into 'service points' (rewards), so seems to be a computerised version of the 1960s loyalty stamps marketing systems. Both the USPTO and the EPO rejected it, between them identifying three prior patent documents. It was abandoned in the USA after the

process system for delivery at a specified time to a locked container (see p. 11 above) and for a method of secure transactions using encrypted fingerprints (see p. 16 above) which is a software process for the transaction method not the encryption nor the fingerprint technology. It has also granted a patent for "Method and apparatus for managing information exchanges between apparatus on a worksite" (AU2004307528, priority 22 October 2003), initially rejected in Australia as 'mere workshop improvements'. The specification states this 'invention' is an enhancement of an earlier system, funded as an EU project. The EPO's IPER noted that the solution to the problem addressed—activating a module to manage an item over a network—would be obvious as URLs are by definition hierarchical, but no problems were raised as to patentable subject matter. Like other patents in this dataset it is for a software program. It is hard to see where the EPO found the 'technical' problem necessary for the patent monopoly it granted.

In the USA, a number of the cases were initially rejected as being computer programs, but were allowed following redrafting, though the redrafting did not change the underlying 'invention'.⁵⁶ More recently examiner subject matter rejections are more strongly worded. In rejecting "System and method for selecting a service provider" (AU 2003200220, priority 23 May 2002) on computer program grounds, the US examiner cited *In re Bilski*, *Diamond v Diehr*, *Parker v Flook*, *Gottschalk v Benson* and *Cochrane v. Deener* (94 U.S. 780,787-88 (1876)). Despite the stronger language of this rejection, precedent suggests mere rewording will overcome these objections. The applicant also needs to overcome novelty and inventiveness objections in respect of this software system for comparison shopping for services, where offered prices are weighted by two quality criteria.

CONCLUSIONS

These cases highlight the many problems that have developed in the legal 'doctrines' (policies) used to determine inventiveness: excision of existing knowledge before the tests are applied; reverse onus of proof; doctrines that generally presume any new combination is inventive; failure to apply the 'analogous use' doctrine to process patents; allowance of trivial variations; and minute semantic differences. They also show a tendency to allow patents where there is no distinction between the idea and the artefact or the specification of a 'problem' and the identification of a solution. There is no indication of any concern that there should be a consideration passed to the nation in exchange for the monopoly grant.

first rejection. The EPO examiner accepted that claim 1 was 'technical' as it ran on a computer but the overall EPO conclusion was that this 'invention' involved implementation of a business scheme which would be a "typical task" for a person skilled in the art. The application was then withdrawn. It was refused in Korea.

⁵⁶ For example, "System and Method for On-line Analysis and Reporting of Financial Operation Data from Community Pharmacies" (AU2003204214, priority 25 June 2002), where the application itself makes it clear that this is simple computerisation of known processes. The first US rejection raised novelty and obviousness as well as computer program (unpatentable) objections. Simple rewording to computer-readable storage medium claims overcome the latter objection, though obviousness objections remained and eventually the application was deemed withdrawn. A similar amendment to the claims in "Transaction accounting processing system and approach" (AU2005255399, priority 9 June 2004) also overcame the US objection that this was a computer program, though that is what it remains. This accounting system allows users to define the general ledger (GL) codes and allocate different codes to the same type of transaction depending on the time of day. The US examiner raised novelty and obviousness objections. Amendments, and a restriction to one sub-sets of the claims, saw the application granted. It is pending at the EPO: the first report has rejected it as being computer program per se and the claims have been amended.

Do these problems apply only to software and business method patents? Only 12 of the 69 cases with relevant data show that no existing documented knowledge could be found. So, yes, there is some problem in identifying existing knowledge, but this occurs in less than one in six cases. In all the other cases the grant of the patent monopoly is a result of highly prescriptive rules that have been developed without any assessment of their economic impact. This suggests that the level of inventiveness in genuine technology fields is also likely to be this low—the same decision making rules are used. If this so, the vast majority of granted patent monopolies are providing no benefit. This raises the strong possibility that the patent system now acts to reduce economic well-being.

What of other jurisdictions? There is some evidence that the ‘technical’ problem criterion developed through EPO case law may be effective in refusing grant to a proportion of business method applications. But the EPO has granted patents to three of the cases, discerning both a ‘technical’ effect and inventiveness. This suggests that despite the ‘synergy’ doctrine the inventive step is also very low at the EPO. Bakels and Hugenholtz note the ‘technical’ test is there to serve a purpose—ensuring monopolies are granted only for something that is sufficiently inventive to merit such a privilege and suggest it would be better replaced by an inventiveness test of a reasonable height (Bakels and Hugenholtz, 2002). These data also suggest that a proper inventive step would be more effective than the arbitrary ‘technicality’ test in ensuring that uninventive ‘inventions’ are not awarded monopolies.

In the case of the USPTO there are clearly examiners who are trying hard to reject uninventive applications. Some applicants, however, go over their heads and move to lodge appeals quickly. But it is also clear that trivial differences in inessential features can lead to the grant of a US patent as easily as an Australian patent.

It would be useful to repeat this type of assessment in other technology fields and in other jurisdictions. Doctrinal literature, case law and patent examiners’ manuals combine to suggest that the height of the inventive step is likely to be found to be miniscule to non-existent in all fields and most jurisdictions.

A final comment is needed on the effect of granting patent monopolies for uninventive patents. A surprising number of commentators ask whether this in fact creates any problem.⁵⁷ Apart from bringing the law into disrepute, granting monopolies in exchange for nothing creates a rent-seeking mentality. It also diverts resources in innovating firms to dealing with the patent system instead of dealing with customers, markets and competition. At the epip conference last year, Alison Brimelow emphasised that the purpose of the patent system is to encourage innovation and called for more economic evidence on its impact. The findings presented here raise serious issues about where the inventive step threshold is set, and suggest an urgent need for similar scrutiny in other technology classes and jurisdictions. The grant of monopolies for clearly uninventive inventions does nothing to encourage innovation, but a great deal to encourage anti-competitive strategies.

⁵⁷ Many commentators (e.g. Gans, Williams and Briggs, 2004; Lemley, 1997) assume few patents are used, but there is no evidence for this.

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