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Obviousness and New Technologies

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Cover Page Footnote

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Obviousness and New Technologies

John Kasdan*

INTRODUCTION

Let's take a look at a claim from a patent issued last year. Claim 1 of US Patent No. 5794207 (the so-called "Priceline.com patent") reads as follows:

1. A method for using a computer to facilitate a transaction between a buyer and at least one of sellers [sic], comprising: inputting into the computer a conditional purchase offer which includes an offer price; inputting into the computer a payment identifier specifying a credit card account, the payment identifier being associated with the conditional purchase offer; outputting the conditional purchase offer to the plurality of sellers after receiving the payment identifier; inputting into the computer an acceptance from a seller, the acceptance being responsive to the conditional purchase offer; and providing a payment to the seller by using the payment identifier.¹

This has been referred to as a reverse Dutch auction, and in-

* Lecturer in Law, Columbia University School of Law. The preparation of this paper was supported by a writing grant from the Oracle Corporation. Additional funding was provided by the Julius Silver Program in Law, Science and Technology at the Columbia University School of Law. The author would like to thank Hal Edgar, Henry Lebowitz and David Boundy for useful conversations regarding this paper, Gerald Goldberg and several of his examiners for attempting to give me some understanding of the workings of the Patent Office examination procedure and Frank Grad for encouragement, useful citations and a place to work. Any errors, misunderstandings or solecisms are entirely the responsibility of the author.

1. Patent #5794207, "Method and apparatus for a cryptographically assisted commercial network system designed to facilitate buyer-driven conditional purchase offers," issued Aug. 11, 1998.

deed it has some of the aspects of the Dutch auction in that a plurality of sellers have the choice of accepting the offered price.² However it seems to lack the defining characteristic of the Dutch auction: that the price declines before the bidders, placing pressure on the high-value bidder as soon as the price drops below his reservation value.³ But in any case, this procedure sounds not unlike what one does when one calls a travel agent and says, “get me a ticket to Peoria for next Tuesday on any airline, and charge it to my credit card, but don’t get it unless it’s under \$400.”

In other words, probably to most laymen, and even to a reasonable number of intellectual property lawyers, this sounds like a patent which has been given to a procedure which has been around, if not necessarily in a computer context, for a long time. How have we gotten into a situation where such patents are issuing, what is likely to happen to them, should we worry about them and, if so, are there any actions we should take?

I. PATENTS ON METHODS OF DOING BUSINESS

A recent decision, *State Street Bank and Trust Co. v. Signature Financial Group*⁴, has brought a new clarity to the patenting of “business methods.”

The patent in question (assigned to Signature) is described as being:

generally directed to a data processing system (the system) for implementing an investment structure which was developed for use in Signature’s business as an administrator and accounting agent for mutual funds. In essence, the system, identified by the proprietary name Hub and Spoke, facilitates a structure whereby mutual funds (Spokes) pool their assets in an investment portfolio (Hub) organized as a partnership. This investment configuration provides the admin-

2. McAfee and McMillan, *Auctions and Buildings*, 25 J. OF ECON. LIT. 699, 702 (June 1987).

3. *Id.*

4. 149 F.3d 1368 (Fed. Cir. 1998), cert. denied, 119 S. Ct. 704 (1999).

istrator of a mutual fund with the advantageous combination of economies of scale in administering investments coupled with the tax advantages of a partnership.⁵

State Street attempted to license the patent and, when negotiations broke down, sued in Massachusetts District Court for a declaratory judgment holding the patent invalid as not claiming statutory subject matter under the patent laws. The District Court found, among other things, that the subject matter of the Signature patent indeed fits into a judicially created exemption which prohibited the patenting of “business methods.”⁶

However, in his opinion overturning the decision of the District Court, the late Judge Giles S. Rich stated: “[t]he business method exception has never been invoked by this court, or the CCPA, to deem an invention unpatentable.”⁷ And he concluded his analysis by decreeing, “[w]hether the claims are directed to subject matter within § 101 should not turn on whether the claimed subject matter does ‘business’ instead of something else.”⁸

Thus, since certiorari was denied by the Supreme Court⁹ the Patent Office will of necessity find itself examining patents relating to methods of doing business. While a certain number of such patents, for example number 4346442, “Securities brokerage-cash management system” issued in 1982, have been granted before, and have even been defended successfully in litigation,¹⁰ *State Street* changes, and substantially broadens, the field of discoveries which must hereafter be viewed as statutory subject matter under 35 U.S.C. §101.¹¹

5. *Id.* at 1370.

6. *Id.* at 1375.

7. *Id.*

8. *Id.* at 1377.

9. 119 S. Ct. 851 (1999).

10. *See Paine, Webber, Jackson and Curtis v. Merrill, Lynch, Pierce, Fenner and Smith*, 564 F. Supp. 1358 (D. Del. 1982).

11. “Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefore, subject to the conditions and requirements of this title.” 35 U.S.C. § 101 (1994).

For example, in *Paine, Webber v. Merrill, Lynch*, Judge Latchum carefully noted:

if no [mathematical] algorithm exists, the product of a computer program is irrelevant, and the focus of analysis should be on the operation of the program on the computer. The Court finds that the 442 patent claims statutory subject matter because the claims allegedly teach a method of operation on a computer to effectuate a business activity.¹²

On the other hand, in *State Street* Judge Rich broadly proclaimed of the business method exception, “[w]e take this opportunity to lay this ill-conceived exception to rest” and went on to say, “[s]ince 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.”¹³

Since he referred to cases from as long ago as 1908¹⁴ which far pre-date the computer, it is arguably the case that Rich was suggesting that even business methods which are implemented without the use of a computer should be eligible for patent protection (although it appears that, under current practice, the PTO would reject such applications). However, he certainly did not suggest that the section 103 non-obviousness required for patentability must be found in the details of the computer program which implements the business method.¹⁵

In fact, Judge Rich’s reliance on *Diamond v. Diehr*,¹⁶ suggests that the analysis of a patent for a business method should focus on the method itself.¹⁷ As Justice Rehnquist wrote in that case, “[t]he claimed invention is a process for molding raw, uncured synthetic rubber into cured precision products”¹⁸ and went on merely to state

12. 564 F. Supp. 1358, 1369.

13. 149 F.3d at 1375.

14. *Id.* at 1376 (Rich, J. referring to *Hotel Security Checking Co. v. Lorraine Co.*, 160 F. 467 (2d Cir. 1908)).

15. *See id.*

16. 450 U.S. 175 (1981).

17. *See State Street*, 149 F.3d at 1373.

18. *Diehr*, 450 U.S. at 177.

that the presence of a computer program in the implementation of the invention did not remove it from the category of patentable subject matter. This left the determination of non-obviousness to considering whether the “method of molding rubber” was non-obvious, not whether the computer programming was.¹⁹

Similarly, when Judge Rich, in *State Street*, addressed the lower court’s finding that “the [Signature] Patent is claimed sufficiently broadly to foreclose virtually any computer-implemented accounting method necessary to manage this type of financial structure,”²⁰ he remarked “[w]hether the patent’s claims are too broad to be patentable is not to be judged under §101, but rather under §§ 102, 103 and 112.”²¹ But that at least leaves open the possibility that the requirement of novelty and non-obviousness could be found in the method and not its implementation.

So if patents on obvious business methods are not to be awarded, it must be because they are obvious, not because they read on methods of doing business. So the next question which must be addressed is: how is obviousness to be assessed?

A. Non-obviousness

35 U.S.C. 103 was one of the great advances of the Patent Act of 1952.²² By setting forth a definition of the quantum of difference required to make an innovation patentable, it was intended to end the type of hind sight employed in cases like *Great A&P Tea Co. v. Supermarket Equipment Corp.*²³ In that case a device for moving customer’s purchases up to the cashier was disallowed,

19. *Id.*

20. 149 F.3d at 1377.

21. *Id.* at 1375.

22. 35 U.S.C. §103(a) (1994) states: “A patent may not be obtained though the invention is not identically disclosed or described as set forth in § 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.” Further sections of §103 refer to biotechnology and are not relevant to this paper.

23. 340 U.S. 147 (1950).

even though the Supreme Court agreed with the lower court's findings that the, "device works as claimed, speeds the customer on his [sic] way, reduces checking costs for the merchant, [and] has been widely adopted and successfully used."²⁴ Nonetheless, quoting an earlier case, the Court stated that: "[t]he mere aggregation of a number of old parts or elements which, in the aggregation, perform or produce no new or different function or operation than that theretofore performed or produced by them, is not patentable invention."²⁵ In a concurrence, Justice Douglas went even further, stating:

[the] patent in the present case belongs to this list of incredible patents which the Patent Office has spawned. The fact that a patent as flimsy and as spurious as this one has to be brought all the way to this Court to be declared invalid dramatically illustrates how far our patent system frequently departs from the constitutional standards which are supposed to govern.²⁶

In 1966, Section 103 was fleshed out by the Supreme Court.

Under section 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or non-obviousness of the subject matter is determined. Such secondary considerations such as commercial success, long felt but unsolved needs, and failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or non-obviousness, these inquiries may have relevancy.²⁷

However, with new technologies, certain of these secondary factors are unlikely to be present. In a field which has just started

24. *Id.* at 149.

25. *Id.* at 151.

26. *Id.* at 158.

27. *Graham v. John Deere*, 383 U.S. 1, 17-18 (1966).

to develop, for example selling over the Internet, there is unlikely to be anything which is truly a “long felt need” simply because of the short time scale involved. Also, it is unlikely that many people will have attempted to solve the problem for the same reason: there has not been enough time for many people to address it.

Some cases have recognized a negative version of the secondary considerations.²⁸ Evidence of independent invention, although not providing a defense to patent infringement, has been recognized as an indication of the level of knowledge in the field.²⁹ However, as with positive uses of secondary considerations, in a new technology there is unlikely to be enough history for such considerations to be useful at the time that a patent is issued. Even if such considerations, or their absence, might determine the results of an infringement action, they would not have been available to avoid the issuance of the bad patent in the first place.

In the absence of secondary indicia, the primary query relevant to obviousness, determining “the scope and content of the prior art . . . [the] differences between the prior art and the claims at issue . . . and the level of ordinary skill in the pertinent art . . .”³⁰ would seem to be the archetypical question for which expert testimony would be both necessary and sufficient. If the task is to determine what the person of ordinary skill in the art was capable of, why not find such a person and ask her? The problem, of course, is the recurrent one of hindsight. The question is being asked with knowledge of the patent application, and invention may be far easier with that hint. Despite this admitted problem, it is possible to think that the Court of Appeals for the Federal Circuit has gone too far in the opposite direction and made it too difficult to prove obviousness, especially when dealing with new and unfamiliar technologies. For example, the predecessor court to the Federal Circuit, the Court of Custom and Patent Appeal (“CCPA”) stated in *In re Pardo*:

28. See *In re Merck*, 800 F.2d 1091, 1098 (Fed. Cir. 1986).

29. *Id.*

30. *Graham*, 383 U.S. at 17.

[T]his court will always construe [the rule permitting judicial notice] narrowly and will regard facts found in such manner with an eye toward narrowing the scope of any conclusions to be drawn therefrom. Assertions of technical facts in areas of esoteric technology must always be supported by citation to some reference work recognized as standard in the pertinent art.³¹

But this puts the matter exactly backwards. It is precisely in “esoteric technologies” that it is most likely that the practitioners will have knowledge of techniques that will be incomprehensible to people outside of the field and yet will not have been written down in a “reference work recognized as standard” simply because there may not be any such work in a new field.

Since *State Street* was only decided in 1998, there has not yet been extensive litigation regarding patents in the business methods area. However, *In re Pardo*³² concerns another technology (inventions involving computer programs) whose eligibility for patents was only decided comparatively recently, and where complaints have also been made about the granting of patents to obvious innovations. I will, therefore, look more closely at the dispute in *In re Pardo* and another Federal Circuit case, *In re Zurko*,³³ in the hope that the treatment of obviousness in those cases will yield insights that may be useful in the business methods field.

B. *Obviousness in Program Patents.*

1. *In re Pardo*

Refac Corporation, the assignee of Mr. Pardo’s patent, sued Lotus Development Corp., Ashton-Tate Inc., Borland Interna-

31. 684 F.2d 912, 917 (CCPA 1982). (The “judicial notice” involved was a determination by an examiner for the Patent and Trademark Office (hereinafter, “PTO”) that the invention in question would have been obvious to a computer programmer in 1970.)

32. *See id.*

33. *In re Zurko*, 111 F.3d 887 (Fed. Cir. 1997) (“Zurko I”), *rehearing en banc*, 142 F.3d 1447 (Fed. Cir. 1998) (“Zurko II”); *reversed, sub nom*, *Dickinson v. Zurko*, 119 S. Ct. 1816 (1999).

tional, Inc., Computer Associates International, Inc., Microsoft Corporation, and Informix Software, Inc. for infringement.³⁴ All of the defendants manufactured spreadsheet programs. Since none of the Refac litigation gives any indication that any of the defendants actually used Mr. Pardo's disclosures to write its code, the reasonable conclusion is that every spreadsheet producer who faced the problem of allowing users to introduce equations in random order managed to solve it. In accordance with the teachings of *In re Merck*³⁵ this would tend to indicate that the state of knowledge in the programming field was such that the innovation was obvious and would thus suggest that in this matter the PTO was right and the CCPA wrong.

To see what kind of patents get granted under the CCPA rule (which has never been repudiated, either by the CCPA or by its successor court, the Federal Circuit and is, therefore, binding precedent for the Federal Circuit) let us look at *In re Pardo* more closely. In that case, the court was faced with a rejection of an application by the PTO Board of Appeals.³⁶ The application claimed a method of solving equations, independent of the order in which they were arranged. The Board described the invention as follows:

Suppose a user provides the following information:

- (1) values for a, b, c and d;
- (2) $A = X + Y$;
- (3) $X = a + b$; and
- (4) $Y = c + d$.

Obviously, a computer cannot execute these operations in the order presented because step (2) cannot be performed until the results of steps (3) and (4) are obtained. What the appellants' algorithm does is rearrange the order of the

34. Refac Int'l. Ltd. v. Lotus Dev. Corp., *et al.*, 131 F.R.D. 56 (S.D.N.Y. 1990).

35. *In re Merck*, 800 F.2d 1091, 1098 (Fed. Cir. 1986) (recognizing evidence of independent invention as an indication of the level of knowledge in the field but not providing a defense to patent infringement).

36. 684 F.2d at 914.

formulae as presented by the user so that the computer can execute the operations. Thus, using our example, the appellants' algorithmic process would rearrange the formulae as follows:

- (1) values for a, b, c and d;
- (2) $X = a + b$;
- (3) $Y = c + d$; and
- (4) $A = X + Y$.

These formulae, as arranged, can be executed by the computer in a logical, sequential fashion.³⁷

A representative claim for the application described the method employed as:

- (a) examining each of said formulas in a storage area of the data processor to determine which formulas can be designated as defined;
- (b) executing, in the sequence in which each formula is designated as defined, said formulas designated as defined;
- (c) repeating steps (a) and (b) for at least undefined formulas as many times as required until all said formulas have been designated as defined and have been executed; . . .³⁸

In other words, all of the equations, and all of the variables on which they depend, are stored in memory. The algorithm then teaches looking through the list, identifying all variables which are given values, either in their defining equations, or from input statements. These are identified as being defined. In the next (and all successive) repetitions of the procedure, the remaining variables are inspected to see whether they are defined in terms of variables which have previously been marked "defined." The algorithm ends when either all formulae and variables have been marked "de-

37. *Id.* at 913-14.

38. *Id.* at 914.

defined,” or there is a pass when no formula or variable can be moved from “undefined” to “defined.”

There are two possible ways in which this invention might be non-obvious. Firstly, the method of solving the rearrangement problem might be non-obvious. Secondly, the very notion of allowing the user to present equations in any order and having the program do the rearrangement might be the non-obvious part of the patent application. Let us consider both possibilities.

The problem addressed by Mr. Pardo is a specific application of a problem in graph theory known as “topological sort.”³⁹ The

39. An ordering is a generalization of the notion of “greater than or equal to” for real numbers. Formally, if S is a set of elements, then a relation between elements of S is a (partial) ordering if it satisfies the following conditions:

(i) transitivity: if $a < b$ and $b < c$ then $a < c$.

(ii) non-reflexivity: if $a < b$ and $b < a$ then a and b are the same element.

If, furthermore, for any two elements of S , a and b , either $a < b$ or $b < a$, (or, if a and b are the same element, both) then the ordering “ $<$ ” is called a total ordering. The topological sort problem asks whether, given an ordering, $<$, there exists a total ordering $<<$ extending $<$. That is, whenever $a < b$ then $a << b$.

A solution to the topological sort problem consists not only of an answer to the above question (the answer is “yes”) but also an effective way of constructing the extending total order. It is also desirable that the method (or algorithm) work quickly, both because topological sort is used in many computer applications (the name comes from its use in computer graphics) where speed is desired and because faster methods are usually viewed as more elegant by the mathematicians who develop them. To see the relation between topological sort and the reordering problem in Pardo’s application, let S be the set of all formulae and variables to be solved. Say $a < b$, if b is defined in terms of a , that is, if a is one of the variables in the definition of b . In the example given by the Board, $X < A$, $Y < A$, $a < X$, $b < X$, $c < Y$, $d < Y$.

An example of an extending total order is:

$a < b << X << c << d << Y << A$.

The equations can be solved in the order given by going from left to right in the total order. Note that the given total order is not unique. For example: a, b, c and d could be in any order, so long as a and b precede X and c and d precede Y . Other, similar, changes may also be made.

The trouble with the Pardo algorithm is that it could transfer as few as one variable from “undefined” to “defined” in each pass. Furthermore, for each variable it examines, it must check the status of every variable on which it depends. If even one of those variables is undefined, it moves on to the next, discarding all of the information it has on the other defining variables. A much faster method can be devised which traces the dependencies of variables in order. Starting with A such an algorithm might then go to X which, it would then notice, depends on, say, a , for which there is an assigned value. That would

method given in the patent application is a solution, albeit a very poor one, to this problem. Although a better algorithm for this problem was not published until 5 years after Pardo filed his patent application, it is likely that his technique was used even before its publication because the problem is a common one and because depth-first search was a primary application of the computer language LISP 1.5 which was introduced some ten years before Pardo's application.⁴⁰

But the important point is that the method employed by Pardo is indeed the obvious one to try. It consists of saying, "what can I do?" at each step and then doing it. However, the CCPA was not convinced, as the Board of Appeals had been, of the transparency of the method. Apparently the Board of Appeal failed to cite an appropriate reference for the triviality of the programming technique. It is hard to believe that any reader of Knuth's *Art of Computer Programming*,⁴¹ the first edition of which was published in 1968, would have had much difficulty working out Pardo's method, but the failure to adduce such evidence led to the patent being granted.

As for the other possibility, that the realization of the desirability of being able to reorder equations was the non-obvious part of the application, it must be remembered that every maker of spreadsheets apparently noticed and solved that very problem.⁴² The fact that reordering had not been a major feature of computer languages before the advent of spreadsheets is due to the nature of the users of earlier computers. When computers were used only by pro-

mean that a could be marked as the "smallest" element of the total order being constructed. The algorithm would next check b, the other variable on which X depends, find it had a value, mark b as "next smallest", return to X, find that it was now defined solely in terms of variables already defined, and mark X "third smallest", and continue in that manner. This technique is called depth-first search, and its application to topological search was first published by Tarjan in 1975. The total order displayed above is the one which would result from an application of Tarjan's method.

40. LISP is a computer language (LIST Processing Language) invented at MIT in the late 1950's. It is a high level language (HLL) as opposed to an assembler language. (visited October 26, 1999) <<http://www.netmeg.net/jargon/terms/l/lisp.html>>.

41. See DONALD ERVIN KNUTH, *THE ART OF COMPUTER PROGRAMMING* (1968).

42. See *Refac Int'l Ltd. v. Lotus Dev. Corp.*, 131 F.R.D 56 (S.D.N.Y. 1990).

grammers and engineers it was easy simply to let the users take care of ordering their equations properly. Furthermore in that period, pre-1970, computers were expensive and had little memory. It simply did not make sense to use the computer to do things that the user could easily do. But with the advent of cheap microcomputers and spreadsheets, untrained users were putting together spreadsheets on which they might do complicated calculations. If a user decided that column 10 should represent “local taxes” and did not realize until she was designing column 17 that she needed a “local real estate tax rate” value it was a real convenience to her if the computer would make it all come out right. Furthermore, by the time that spreadsheets came out in the late 1970’s, computers were cheap enough and big enough so that they could do the necessary work, even employing as inefficient an algorithm as the one set forth by Mr. Pardo.

As a further note, the Board of Appeals had also rejected the application because the patent claimed an algorithm and was therefore barred by the Supreme Court’s decision in *Gottschalk v. Benson*.⁴³ On the matter of statutory subject matter, the CCPA had this to say:

It has often been recognized that the word “algorithm” is subject to a number of definitions. The Supreme Court has defined it as a ‘procedure for solving a given type of mathematical problem.’ [footnote and citations omitted] It is this type of algorithm that constitutes nonstatutory subject matter, and this court has consistently rejected attempts to enlarge the ‘mathematical algorithm’ exception to the definition of patentable subject matter is § 101 to include nonmathematical algorithms.⁴⁴

But the CCPA was “unable to find any mathematical formula, calculation, or algorithm either directly or indirectly recited in the claimed steps of examining, compiling, storing, and executing.”⁴⁵

43. 409 U.S. 63 (1972).

44. *Pardo*, 684 F.2d at 915.

45. *Id.* at 916.

Indeed, the examiner acknowledged that “[t]he ‘algorithm’ of the present application is not ‘mathematical’ (although it deals with the proper sequence for performing mathematics).”⁴⁶ That is, *Benson* dealt only with mathematical algorithms and, while Pardo did claim an algorithm, it wasn’t a mathematical algorithm, so there was no section 101 problem. This limitation of the meaning of “mathematical” seems idiosyncratic both as a matter of the field’s definition of itself and of the logic of the decision in *Gottschalk v. Benson*.⁴⁷

2. In re Zurko

The theme of requiring specific references to all of the details to find a computer-related patent application to be obvious recurs in *Zurko I*.⁴⁸ Here the matter is somewhat less clear, because the patent application, as quoted by the Federal Circuit uses terms which are not as commonly used in the computer literature as are those used in *Pardo*. Nonetheless, the outline of the invention can be reconstructed, partly by reference to the corresponding European filing.⁴⁹

Claim one of the application read:

1. A machine-executed method for executing a trusted command issued by a user on a computer system, the computer system including an untrusted computing environment and a trusted computing environment, said method comprising the steps of: (a) parsing the trusted command in the untrusted computing environment to generate a parsed command; (b) submitting the parsed command to the trusted computing environment; (c) displaying a representation of the parsed command to the user through a trusted path; (d) receiving a signal from the user through a trusted path signifying whether the displayed representation accu-

46. *Id.*

47. 409 U.S. 63 (1972).

48. 111 F.3d at 889.

49. See Zurko’s European Patent Application, <<<http://www.patents.ibm.com/cgi-bin/viewpat.cmd/EP00443423A3>>> (last visited Dec. 10, 1999).

rately represents the user's intentions; (e) if the signal signifies that the displayed representation does not accurately represent the user's intentions, then preventing the execution of the parsed command; and (f) if the signal signifies that the displayed representation accurately represents the user's intentions, executing the parsed command in the trusted environment.⁵⁰

The Board of Patent Appeals and Interferences found, and the Federal Circuit agreed that the prior art taught all parts of the claimed invention, except (c) and (d) and that the prior art taught performing the same check-back, but through an untrusted path. It rejected the Board's argument that since there are only trusted and untrusted paths, and since the purpose of the invention was to provide security, it would be obvious to try using a trusted path for the check-back. This, the Federal Circuit stated, was impermissible hindsight.

The phrase "trusted path" can have either a hardware or a software meaning.⁵¹ In the former case it refers to shielded and protected cables. In a computer security context, it usually refers to some form of encrypted data transmission. An example of such encrypted communications is provided by MIT's computing environment, Kerberos, which is supplied with many UNIX systems.⁵² Again, what seems to have happened is that the instincts of the PTO examiners were correct but they failed to provide sufficiently detailed documentation of prior art. This, given the Federal Circuit's reluctance to take anything as obvious unless it can be found in a "reference work recognized as standard,"⁵³ was fatal to the rejection.

Of course the PTO has to work within the interpretation of the law given by the Federal Circuit. And, indeed, the rules for the examination of patent applications closely track the case law. For ex-

50. *Zurko I* at 888.

51. *Id.*

52. Menezes, et al, HANDBOOK OF APPLIED CRYPTOGRAPHY, 501-502 (1997).

53. *Pardo*, 684 F.2d at 917.

ample, the Manual for Patent Examination Procedure states:

Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art.⁵⁴

Thus, in *Zurko*, it is not enough that the prior art teaches, in particular, the usefulness of check-backs and the existence of trusted paths, it must explicitly suggest combining them.

This strict standard may well be the reason that the PTO is currently issuing patents in the business methods fields which appear to many observers to be quite obvious. For example they may not have found the Priceline.com patent quoted at the beginning of this paper⁵⁵ to be obvious because, following the directives of the Federal Circuit, they were unable to find anything in the literature suggesting that it might be a good idea to computerize such transactions.

Ultimately, whether one feels that patents are being granted which should be rejected for obviousness or whether one feels that the current practice is the only effective prophylaxis against a descent into unbridled hindsight seems to be a matter of personal opinion and professional situation. However, especially if one agrees that the examples I have cited show that patents are being granted which should not be, the question of what can and should be done about them remains to be discussed. Which brings us to the Supreme Court's review of *in re Zurko*.⁵⁶

3. *Dickinson v. Zurko*

As discussed above, in *Zurko I* the Federal Circuit reversed a decision of the Board of Patent Appeals and Interferences rejecting

54. MANUAL OF PATENT EXAMINATION PROCEDURE § 2143.01 (citations omitted).

55. See *supra* note 1 and accompanying text.

56. 409 U.S. 63.

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Ms. Zurko's application on the grounds of obviousness. As the Federal Circuit explains, in *Zurko II*:

Concluding that the outcome of this appeal turns on the standard of review used by this court to review board fact finding, we accepted the Commissioner's suggestion that we rehear the appeal in banc so that we could consider the following question: "Should this court review Patent and Trademark Office fact-findings under the Administrative Procedure Act standard of review instead of the presently [sic] applied 'clearly erroneous' standard?"⁵⁷

Chief Judge Mayer explained the issue as:

Specifically, the Commissioner argues that in appeals under 35 U.S.C. § 141, we should accept the factual findings underlying the board's patentability determinations as long as they are supported by probative evidence of a substantial nature (the substantial evidence standard found at 5 U.S.C. § 706(2)(E)), or in the alternative as long as they were made upon consideration of the proper factors (the arbitrary and capricious standard found at 5 U.S.C. § 706(2)(A)). Both standards require that we review board decisions on their own reasoning. Currently, we affirm decisions as long as we lack a definite and firm conviction that a mistake has been made.⁵⁸

His decision was that: "[S]ection 559 of the Administrative Procedure Act permits, and stare decisis warrants, [the Court's] continued application of the clearly erroneous standard in our review of these fact-findings."⁵⁹

However the Supreme Court granted certiorari and reversed.⁶⁰ Writing for the majority in a 7-2 decision, Justice Breyer concluded that neither the history of the standard of review applied by

57. *Zurko II*, 142 F.3d at 1449.

58. *Id.* (citations omitted).

59. *Id.*

60. 119 S. Ct 1816.

the CCPA and the Federal Circuit, nor policy considerations justified the application of a stricter standard than that set forth by the Administrative Procedure Act.⁶¹ While finding for the Commissioner of the PTO, Justice Breyer remarked:

The court/agency standard, as we have said, is somewhat less strict than the court/court standard. But the difference is a subtle one—so fine that (apart from the present case) we have failed to uncover a single instance in which a reviewing court conceded that use of one standard rather than the other would in fact have produced a different outcome.⁶²

The problem with this analysis, of course, is that the standard which the Federal Circuit has applied under the name of “clearly erroneous” is not that at all; it is a total *de novo* review under which the court second guesses the PTO whenever it disagrees with its conclusions.

Clearly, this was a classic turf battle. The Commissioner wants greater deference to the decisions of his examiners, and the Federal Circuit wanted to keep the control it had. To the extent that one is convinced by the above argument that patents are being granted to obvious innovation, I suggest that the Supreme Court’s decision will decrease the flow of bad patents.

An interesting question is why the Federal Circuit was so willing to grant patents, which the PTO found to be obvious. The public choice scholars have suggested that administrative agencies are subject to capture by the industries they are supposed to regulate.⁶³ Among the mechanisms they have cited is the movement of people from employment by an agency to employment by firms which they had previously regulated. The danger is that they may try to gain favor with a potential employer by making decisions favor-

61. *Id.* at

62. *Id.* at 1823.

63. See Gary Minda, *Interest Groups, Political Freedom and Antitrust: A Moder Assessment of the Noerr-Pennington Doctrine*, 41 HASTINGS L.J. 905 (1990); Jonathan Macey, *Transaction Costs and the Normative Elements of the Public Choice Model: An Application to Constitutional Theory*, 74 VA. L. REV. 471, 513 (1988) (discussing capture of agencies by those they are intended to regulate).

able to that employer.

Such a scenario certainly could play out among the examiners in the PTO. At least some examiners stay for only a few years and then go off to work for patent law firms or for companies, which handle patent applications internally.⁶⁴ It would clearly be possible for such an agent either explicitly or implicitly to try to trade her actions for future employment.

The possibility of such opportunistic behavior is clearly less at the Federal Circuit. The only short-term personnel there are the clerks and there are far fewer Federal Circuit clerks than PTO examiners and, more importantly, the clerk's affect on any given decision is institutionally shielded and difficult to verify. So at least the cruder of the explanations of "agency capture" would suggest the type of situation which Mr. Justice Douglas thought he observed: a PTO granting unwarranted patents.⁶⁵ But it fails utterly to explain the recent experience of the Federal Circuit pushing software patents on an unwilling PTO.

A possible answer to this conundrum might be the concerns expressed by successive Commissioners about the difficulties which software patents would present to the search capabilities of the PTO. As early as 1972, in *Gottschalk v. Benson*, the Court quoted the Report of the President's Commission on the Patent System.⁶⁶

The Patent Office now cannot examine applications for programs because of a lack of a classification technique and the requisite search files. Even if these were available, reliable searches would not be feasible or economic because of the tremendous volume of prior art being generated. Without this search, the patenting of programs would be tantamount to mere registration and the presumption of validity would be all

64. See Robert A. Armitage, *Corporate Counsel's Role in Patent Litigation: Managing a Legal Team to Meet Business's Objectives*, 375 PLIPat. 135, n.2 (1993).

65. See *Great A & P Tea Co. v. Supermarket Equipment Corp.*, 340 U.S. 147 (1950).

66. *Gottschalk v. Benson*, 409 U.S. 63, 72 (1972).

but nonexistent.⁶⁷

Similar objections were raised by the Commissioner in both *Parker v. Flook*⁶⁸ and *Diamond v. Diehr*.⁶⁹ Perhaps the organizational concerns of the head of the PTO outweighed the opportunism at a lower level. This does not explain the pro-software patent enthusiasm of the Federal Circuit, but perhaps that can be attributed to an unconstrained desire to expand its range of influence.

Surely, a more deferential standard of review will make it easier for examiners to reject applications as obvious. *Zurko*⁷⁰ was precisely about that issue. However, granting greater power to the PTO might not even be a solution to that limited problem? What assurance is there that, at some later time, the PTO might not develop a sort of “A&P” mindset⁷¹ and start applying that type of hindsight to reject too many applications?

While it is, of course, possible to invent a scenario where such a thing occurs, the organizational structure of the PTO would seem to make such a course extremely unlikely. The PTO is currently funded entirely through user fees.⁷² Although there are indeed application fees, there are also issuance fees and maintenance fees. The effect of these is that the PTO has a positive incentive to grant patents. It is, in fact, a tribute to the integrity of the PTO that it rejects as many applications as it does.

In addition, one of the arguments for the existence of administrative agencies is that they can assemble expertise which would be beyond the ability of either the Judiciary or the Legislature to ob-

67. *Id.*

68. 437 U.S. 584 (1978).

69. 450 U.S. 175 (1981).

70. 119 S. Ct. 1816.

71. See *supra* text accompanying notes 23-26.

72. U.S. Patent and Trademark Office, *Our Business: An Introduction to the PTO*, (visited Feb. 10, 1999) <<http://www.uspto.gov/web/menu/intro.html>>. “Since 1991—under the Omnibus Budget Reconciliation Act (OBRA) of 1990—the PTO has operated in much the same way as a private business, providing valued products and services to our customers in exchange for fees which are used to fully fund our operations. The primary services we provide include processing patents and trademarks and disseminating patent and trademark information.” *Id.*

tain.⁷³ The argument is that an agency always faces the same type of problems, and can staff itself accordingly. The Judiciary and the Legislature, on the other hand, have to be generalists. Even in the case of a specialized court, such as the Federal Circuit, there is only a limited research staff and technical expertise is largely provided by clerks whose tenure is, in many case, limited. The PTO, on the other hand, has about 2500 examiners,⁷⁴ many of whom have spent decades with the office. It is at least possible for the PTO to develop the type of expertise which would enable its examiners correctly to judge the skill of the practitioner in a given art.

4. Technical Qualification at the PTO

But it is not enough to say that the PTO could have examiners who could properly handle obviousness. We must also ask whether the PTO's procedures provide any assurance that it would assemble such staff, especially in new fields, where as I have suggested, the problems of obviousness are likely to be greatest. A look at the PTO procedure for the hiring of examiners suggests that it has a degree of difficulty in its accommodation to new fields.

73. *See* *Chevron v. NRDC*, 467 U.S. 837, 865 (1984).

74. "The Patent and Trademark Office (PTO) determines the patentability of discoveries of inventors throughout the world. This determination is made by approximately 2500 highly trained scientists and engineers (Patent Examiners). An Examiner analyzes the subject matter of a patent application and the pertinent prior art, i.e. patents and other published technical materials, and determines whether the claimed invention is patentable. He/she applies procedural and substantive law and grants or rejects the claims of the application." USPTO Organizational Profile
<<http://www.uspto.gov/web/offices/ac/ahrpa/ohr/jobs/exam.htm>>>

According to small number of former examiners with whom I have spoken, some art units give new examiners patent files to study as an introduction to the field in which they will be examining. In other units patent files are not used, but the new recruit is given standard texts in the field, and her progress is monitored by more senior examiners. In either case institutional memory is being preserved. It is precisely this function which, I believe, makes patent examination work in established fields and which, I fear, will not be successfully done in new technologies.

a. PTO Criteria for Examiners.

The PTO maintains an on-line form on which one may apply for the position of patent examiner.⁷⁵ Section 4 of that form requires information on the applicant's educational background.⁷⁶ A subsection of that section requires the applicant to "click on the appropriate button regarding your formal education." The relevant clickable boxes are: "Bachelor Arts/Sciences (Electrical engineering or Computer engineering, Computer Science, Physics, Biology, Biotech, Chemistry, or Chemical engineering)", "Master of Arts/Sciences (Electrical engineering or Computer engineering, Computer Science, Physics, Biology, Biotech, Chemistry, or Chemical engineering)" and "Ph.D" (with no field limitation given for holders of the Ph.D. degree.) The point being that in order even to apply for a position as an examiner, a person must have a degree in a traditional technical field. In particular, a person with a BA in Economics who had later received an MBA from a business school, arguably the ideal background for an examiner who would review patent application for business methods, would be eliminated from consideration for such a position at the earliest part of the application process.

This reluctance to hire examiners with a background outside of engineering and the traditional lab sciences is a historical feature of the PTO. As early as the 1966 report of the President's Commission on the Patent System, it was realized that "[t]he Patent Office now cannot examine applications for programs because of a lack of a classification technique and the requisite search files."⁷⁷ In other words, it was felt that "search files", i.e. previously issued patents, were of necessity the basis for any future searching. The fact that

75. U.S. Patent and Trademark Office, *Employment Application* (visited Oct. 26, 1999) <<http://www.uspto.gov/go/jars/index.html>>.

76. *Id.*

77. SUBCOMM. ON PATENTS, TRADEMARKS AND COPYRIGHTS, COMM. ON THE JUDICIARY, 90TH CONG., REPORT OF THE PRESIDENT'S COMM'N. ON THE PATENT SYSTEM 5, at 13 (U.S. Gov. Printing Office 1967). "To Promote the Progress of . . . Useful Arts," Report of the President's Commission on the Patent System (1966), quoted in *Gottschalk v. Benson* 409 U.S. 63, 72 (1972).

computer programming had by 1966 produced a formidable literature was not recognized nor was the possibility of basing searches on that literature.⁷⁸

For 14 years after the report of the President's Commission, the PTO continued successfully to oppose all inventions involving computer programs. However in 1981 the Supreme Court decided *Diamond v. Diehr*⁷⁹ and, thereafter, the PTO was obliged to examine patents involving computer programs and could not merely reject them as reading on non-statutory subject matter. Nonetheless, according to the Wall Street Journal, the PTO did not hire its first examiner with a degree in computer science, as opposed to the engineering and laboratory science degrees it previously required, until 1995.⁸⁰

This requirement for a degree in the traditional "hard" sciences is also imposed on applicants who wish to become patent agents to engage in patent prosecution practice before the PTO. Here too, the PTO web site provides useful information about the requirements for taking the patent agent examination.⁸¹ In its discussion of the necessity of a technical education for applicants, the PTO gives a series of methods for satisfying its requirements. These are similar to, although more detailed than, the requirements for examiners. However, in the requirements for applicants for the agent examination, the PTO gives a helpful negative list.

[t]he following typify courses which are not accepted as demonstrating the necessary scientific and technical training: science courses for non-science majors; . . . mathematics courses; high school level courses; one day conferences, patent law courses, continuing legal education courses; . . .; courses in management, business administration and operations research; courses directed to data management and

78. *Id.*

79. 450 U.S. 175 (1981).

80. Scott Thurm, *A Flood of Web Patents Stirs Debate Over Tactics*, WALL ST. J., Oct. 9, 1998, at B1.

81. U.S. Patent and Trademark Office, *General Requirements Bulletin* (last modified Nov. 3, 1999) <<http://www.uspto.gov/web/offices/dcom/olia/oed/grb9911.htm>>.

management information systems; . . . ; computer courses which are directed to business applications; . . .⁸²

In other words, the PTO's regulations make it likely that applications involving business systems will not be assisted by agents with the type of business training which would enable them understand, evaluate and present such applications. And to the extent that the PTO continues to have similar requirements for its examiners, these imperfectly prepared applications will be examined by people equally poorly trained.

It is of course true that there are many people with a technical degree which would get them past the PTO's employment requirement who then went on to business school. It is also true that some of those people may apply for jobs as patent examiners. However, depending on such people for business expertise, as the PTO now does,⁸³ substantially limits the pool of applicants.

Nonetheless, there seems to be nothing in either the patent statutes or regulations which would prevent the hiring of, for example, economics majors as examiners. If the PTO were to win the deference which it is seeking in *Zurko*,⁸⁴ it would behoove it to change its staffing procedures so as to be able to use its power wisely. In fact, even if the PTO loses *Zurko*, it should re-think its attachment to engineering and the lab sciences.

II. THE PRESUMPTION OF VALIDITY FOR ISSUED PATENTS.

Finally, assuming that either the PTO is unwilling or, more likely, unable to find examining staff capable of working in new technological fields, it might still be possible to ameliorate the problems of improvidently granted patents if the strong presumption of validity contained in 35 U.S.C. § 282⁸⁵ could be waived.

82. *Id.*

83. Conversation at the PTO with Gerald Goldberg, Director, Technology Center 2700 (which covers most computer program patents) December 18, 1998.

84. See discussion *supra* part I.3.

85. "A patent shall be presumed valid. Each claim of a patent (whether in independent, dependent, or multiple dependent form) shall be presumed valid independently of the validity of other claims; dependent or multiple dependent claims shall be presumed valid

Section 282 asserts that an issued patent is presumed valid. However, the judicial interpretation of this section is that the validity of each and every challenged claim of a patent must be disproved by “clear and convincing evidence,”⁸⁶ a heavier burden than the preponderance of the evidence normally required in litigation. The reason that patents are given such a strong presumption of validity is precisely because of the faith the courts have in the examination process. If, then, the PTO knows that in a particular field its examination is not up to the standard it normally maintains, it follows that the result of examinations in that field should not receive such a strong presumption of validity.

It is clear that the PTO could not adopt such a plan on its own. In a somewhat analogous situation, the PTO attempted to adopt a “rule of doubt” in patent re-examination proceedings where in deciding whether to hold a hearing, it would resolve all issues of validity in favor of the party seeking re-examination and, hence, against the patent holder.⁸⁷ The Federal Circuit noted that there was no statutory authority for such a rule of doubt. It also reviewed the legislative history of the sections concerning re-examination and determined that the procedure was designed to safeguard the interests of the patent holder. Accordingly it found that the PTO had exceeded its authority in attempting to use its rule of doubt.⁸⁸

Since section 282 is undoubtedly intended for the benefit of the patent holder, similar reasoning would probably invalidate any attempt on the part of the PTO to implement a waiver of § 282 on its own. Congress, however, could certainly give the PTO such power. One restriction on such a power might, however be prudent. While agencies may well be reluctant to admit their incapacities in any area, it is also possible that the reduction of pressure on the PTO caused by admitting its deficiencies in examining a given

even though dependent upon an invalid claim . . .” 35 U.S.C. § 282 (1998).

86. *Monarch Knitting Mach. v. Sulzer Morat GmbH*, 139 F.3d 877, 881 (Fed. Cir. 1998). *Huges Tool v. Dresser Indus.*, 816 F.2d 1549,1555 (Fed. Cir. 1987), *cert. denied*, 484 U.S. 914 (1987).

87. *See Patlex Corporation v. Mossinghoff*, 771 F.2d 480, 483 (Fed. Cir. 1985)

88. *See id.*

area might cause it not to work as hard as it could to upgrade the examiners in that area. For that reason a time limit of a few years might be placed on any such waiver.

CONCLUSION

Finally, assume either that the Supreme Court upholds the decision in *Zurko* and the Federal Circuit continues to impose strong requirements for finding obviousness or that the PTO is unable or unwilling to hire examiners who have sufficient background in business to discern obvious methods when they see them. In either case, patents will be granted on techniques that would otherwise be in the public domain. How bad will that be?

Clearly the answer will vary from patent to patent. The entire purpose of the patent grant is to enable the patent holder to raise the price of his invention. However the amount that he can charge depends on how much better his innovation is than the next best way of doing the job. In many cases the patented business may not be much better than its nearest unpatented substitute and in such a case the tax imposed by the patent will be slight.

Richard Nelson has analysed the effect of patents in different fields, and finds great differences in their value in different areas.⁸⁹ In particular, patents are found to be crucial in the pharmaceutical area, very important in many chemical fields and less important in the mechanical and electrical arts.⁹⁰ There are also indications that patents have, despite some well known suits, not played a very great role in the software industry.⁹¹ To the extent that business methods are more like the latter set of arts than the first two, the primary effect of the granting of patents on obvious business methods may not be to levy a debilitating tax on businesses but rather to outrage patent practitioners and even more to outrage intellectual property academics who will not benefit as much from the legal fees such patents will generate.

89. See NELSON, THE SOURCE OF ECONOMIC GROWTH (1996).

90. *Id.*

91. *Id.*

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