

U.S. Patent Practice after Bilski

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Patent Eligible Subject Matter in the U.S.

The United States Congress was empowered in 1789 to promote science and the useful arts.¹ Congress responded by enacting a patent law, which it has revised several times since. The most recent enactment became law in 1952, and was largely drafted by two men, Judge Giles S. Rich and Pasquale J. Federico, long time head of the U.S. Patent Office.

Rich and Federico envisioned a patent system that would accept inventions that fell into four broad categories:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.²

When Congress adopted this statutory language the stated intent was to broadly define patent eligible subject matter as “anything under the sun that is made by man.”³ The U.S. Supreme Court later echoed this broad scope in its 1980 decision in *Diamond v. Chakrabarty*⁴, which held that a manmade life form was patent eligible.

Laws of nature, physical phenomena, and abstract ideas are not patentable

The broad reach of “anything under the sun that is made by man” does have its limits. The U.S. Supreme Court made clear in *Chakrabarty* and in several other decisions that laws of nature, physical phenomena, and abstract ideas are not patentable. Laws of nature and physical phenomena have proven relatively easy to define. By comparison, the abstract idea remains a challenge to this day. Indeed, defining what is, and is not, an abstract idea presents a challenge similar to the challenge once faced by U.S. Supreme Court Justice Potter Stewart in this famous case:

I shall not today attempt further to define the kinds of material I understand to be embraced within that shorthand description [“hard-core pornography”]; and perhaps I could never succeed in intelligibly doing so. **But I know it when I see it**, and the motion

¹ United States Constitution, Article 8, Clause 8.

² 35 U.S.C. §101.

³ S Rep. No 1979, 82d Cong., 2d Sess., 5 (1952); H.R.Rep. No. 1979, 82d Cong., 2d Sess., 6 (1952).

⁴ 447 U.S. 303 (1980).

picture involved in this case is not that. [Emphasis added.]— Justice Potter Stewart, concurring opinion in *Jacobellis v. Ohio* 378 U.S. 184 (1964).

Abstract Idea — The Federal Circuit Court’s Attempt to Define

The Court of Appeals for the Federal Circuit, the court that hears all patent appeals in the United States, for many years defined the abstract idea by what it was not. It said:

This is not a disembodied mathematical concept which may be characterized as an "abstract idea," but rather a specific machine to produce a useful, concrete, and tangible result.⁵

This interpretation became known as the useful-concrete-tangible result test. In breaking down the test into its constituent components there was little debate over what was useful. Practically everything can be deemed useful to someone. Concrete was defined to mean “capable of producing repeatable results.” However, a difference of opinion arose as to what constitutes a tangible result. One faction believed that tangible implied the sense of touch. If you could touch it, or dust it with a feather duster, the result was tangible. Another faction believed that tangible simply meant capable of being perceived by one of the human senses. Thus a visual display of numbers in a bank ledger could be a tangible result (presumably if the amount was big enough).

The debate over how far to extend the useful, concrete and tangible result test finally reached a head when Bernard A. Bilski applied for a patent on a method for hedging risk.

⁵ In re *Alappat*, 33 F.3d 1526 (Fed. Cir. 1994)

Bilski Attempts to Patent Hedging Risk

Bilski applied for a method of hedging risk in the energy commodity market. In his claim Bilski sought to corner the market on commodity hedging:

1. A method for managing the consumption risk costs of a commodity sold by a commodity provider at a fixed price comprising the steps of:
 - (a) initiating a series of transactions between said commodity provider and consumers of said commodity wherein said consumers purchase said commodity at a fixed rate based upon historical averages, said fixed rate corresponding to a risk position of said consumer;
 - (b) identifying market participants for said commodity having a counter-risk position to said consumers; and
 - (c) initiating a series of transactions between said commodity provider and said market participants at a second fixed rate such that said series of market participant transactions balances the risk position of said series of consumer transactions.

The Patent Office rejected Bilski's claim as being drawn to an abstract idea and refused to grant the patent. Bilski appealed and was at every stage rejected by the Board of Appeals, by the Court of Appeals for the Federal Circuit, and ultimately by the U.S. Supreme Court. While all agreed that Bilski's claim had to be rejected, there was a significant disagreement over how far-reaching the decision should extend.

The Court of Appeals in its en banc decision in *In re Bilski*⁶ decided to abandon its prior useful-concrete-tangible result test in favor of a stricter machine-or-transformation test. Under the machine-or-transformation test a method could be found statutory if the claim required use of a particular machine, or if it transformed an article to another state or thing. The linchpin of the Court of Appeals' decision: the machine-or-transformation test was deemed the *only* way a method claim could be found patent eligible.

The Supreme Court, in *Bilski v. Kappos*⁷ agreed that the Bilski claim was not patent eligible. However, it refused to adopt the far reaching precedent that the machine-or-transformation test was the *only* way a method claim could be found patent eligible. Rather it held that the machine-or-transformation test is one test which may be used, but it is not the only test. The Supreme Court refrained from opining what such other test might be.

⁶ *In re Bilski*, 545 F.3d 943 (Fed. Cir. 2008).

⁷ *Bilski v. Kappos*, 561 U.S. ____ (2010).

U.S. Patent Prosecution Today

As a result of the *Bilski v Kappos* decision, which refrained from giving specific guidance on any new test, USPTO examiners today gravitate to the test they understand: the machine-or-transformation test. Therefore, most business method patent applicants today are drafting their method claims to recite use of a particular machine, such as a suitably programmed computer, or to recite a specific transformation of an article (or transformation of data representing an article) where possible.

USPTO and Board of Appeals Track Record So Far

Currently USPTO examiners are rejecting many applications for failure to comply with 35 U.S.C. §101; that is, for failure to recite patent eligible subject matter. Recent months have seen a marked increase in the number of §101 rejections. In many instances the perceived §101 defect can be cured by amending the claim to explicitly recite use of a particular machine, or to recite a physical transformation. For many business method inventions this involves reciting that certain steps are performed by a suitably programmed computer. For medical diagnostic inventions this typically involves reciting that some step is performed on the human body (e.g., blood sample is drawn and tests are performed, thereby *transforming* the sample).

In some instances it may be necessary to appeal an examiner's rejection to the Board of Appeals. If you elect this route, be aware that the Board of Appeals regularly uses two tactics that could defeat your appeal if you are not prepared.

1. Deference to Examiner's Factual Findings

The Board of Appeals is entitled to rely on factual findings made by the examiner as to the scope of the prior art and knowledge of a person with skill in the relevant art. Many applicants do not think to submit their own countervailing evidence (through declaration and written exhibits, scientific tests, technical references and the like). This is a mistake. Where the applicant has submitted no countervailing evidence the Board of Appeals is entitled to rely on the examiner's findings, even if the evidence relied upon by the examiner is weak.

Your weapon against this tactic is to submit your own favorable evidence before taking the appeal. This can be done at anytime during prosecution before the examiner, but is probably best submitted after the first office action, or together with an RCE after a final office action. The objective here is to give the examiner a reasonable opportunity to consider your evidence. Once submitted it becomes part of the record which you can rely upon in an appeal.

2. Broadest Reasonable Interpretation

The Board of Appeals, like the examiner, is required to give the claims their "broadest reasonable interpretation" consistent with the patent specification. Many applicants go to an appeal believing their claims are clearly statutory, only to find out that the words in their claims can have a "broadest reasonable interpretation" they did not anticipate. As case in point, in *Ex*

parte Harris,⁸ the applicant was seeking to patent a method of conduction on on-line auction with this claim:

28. A method comprising:
- conducting an auction over a network by accepting bids for items, and establishing a highest bid for an item as being a winning bid; and
 - treating a bid received within a predetermined period of time before an end time of an auction less favorably than bids received prior to said predetermined period.

The Board of Appeals found the claim was not statutory subject matter under 35 U.S.C. §101 because a “network” could be read to include “societal networks of auction houses (e.g. Christies, from 1766).” With this reading, the Board found the method was not patent eligible, as it could be practiced by a group of people gathered in a room.

Applicant Harris was no doubt surprised by this outcome. The *Ex parte Harris* case teaches us to be cautious before appealing claims that employ broad or indefinite terms which can draw an unexpected “broadest reasonable interpretation” that is then used as basis to reject the claim.

Your weapon against the broadest reasonable interpretation tactic is to define at least some important claim terms in the specification at the time of filing. You do not necessarily have to introduce these terms into the claims on initial filing, but you may add them later to at least some of the claims by amendment if you foresee a broadest reasonable interpretation issue before the Board of Appeals. Alternatively, you can consider including some means-plus-function claims in the application. This style of claim is governed by 35 U.S.C. §112, paragraph 6, which requires the examiner to construe a means-plus-function limitation as covering the corresponding structure, material, or acts described in the specification and equivalents thereof.

⁸ *Ex parte Harris*, No. 2007-0325, slip op. (B.P.A.I. 2009).

Common Pitfalls To Avoid

Were you to take a leisurely stroll through the garden of recent Board of Appeals decisions involving the §101 issue, you would find a half dozen large pitfalls that have trapped hundreds of other patent applicants. Let us examine some of these now, so that you can avoid being trapped yourself.

Pitfall 1: Beware of the Broadest Reasonable Interpretation

Every claim reviewed by the Board of Appeals is construed using the broadest reasonable interpretation that is consistent with the specification. As the *Ex parte Harris* case discussed above demonstrates, sometimes the Board of Appeals may adopt a broadest reasonable interpretation that you were not expecting. In *Harris'* case, an on-line auction method employed a claimed network, which the Board of Appeals construed to cover a network of people. With such construction the network did not qualify as a particular machine and the claim failed to meet 35 U.S.C. §101.

While this case may be an outlier, the “broadest reasonable interpretation” analysis is cited in practically every appeal dealing with §101. So it pays to be prepared.

To detect where your claim may have a weakness that would be vulnerable to an aggressively broad interpretation, just play devils advocate. Imagine if you were the examiner. How would you show that the claim covers a non-statutory abstract idea. In that mindset, perhaps you would identify certain key claim terms that have indefinite or broad meaning. Words like network, system, module, software, object, class, schema, database, paradigm, entity or mechanism are possible candidates.

If you can think of a way to construe those terms so the claim would arguably cover an abstract idea, then you can be sure the examiner will do so as well. If you decide to leave these broad terms in the claims as initially filed, be sure you have a backup plan, in the event you find yourself needing to appeal. The safest strategy is to have some defined terms, or means-plus-function terms in the specification. These can be added to the claim before appeal, to minimize the risk of being caught in the broadest reasonable interpretation pitfall.

Pitfall 2: Abstract Blood Flowing in the Claim's Veins

If your invention involves the flow of information, there is a higher than average chance your method claim may encounter a §101 rejection. Of course, inclusion of a *particular machine* within the claim may avoid the issue, by satisfying the particular machine prong of the machine-or-transformation test. However, where the particular machine option is weak or unavailable, you may need to show that a statutory *transformation* is being claimed. Where such transformation involves the transformation of data, it is extremely important that the data represent a non-abstract property. The number of bottles coursing through a filling station, or

the temperature of the rubber mold press prior to opening: these are non-abstract properties. Happiness, customer satisfaction, financial risk: these are abstract properties.

If you look the Bilski claim, reproduced above, you can see the lifeblood of data flowing through this claim is *risk*. The claim is drafted as a method of managing consumption risk. It is no wonder that the examiner, and every court that reviewed this claim all the way to the Supreme Court, found this claim to be drawn to an abstract idea.

To avoid falling into this pitfall, give careful consideration to what physical properties, if any, the invention exploits in performing the claimed method. Then try to work these properties into the body of the claim. Patent examiners will often discount data input steps as “mere data gathering” and data output steps as “insignificant post-solution activity.” Thus your emphasis of physical properties should be imbued within the core concept of the invention.

In medical diagnostic applications you can usually imbue the core concept with some physical transformation. Measuring EKG signals from the heart and extracting diagnostic information from those signals, for example, has been found statutory. Administering a drug to the patient and observing the results has also been found statutory.

Of course, in some situations it may simply be impossible to recite a physical transformation, or even manipulation of data representing a physical condition. In these cases, you will want to claim a particular machine.

Pitfall 3: No support for particular machine

Many business methods inventions today employ computer technology. As such, these inventions will likely use a specially programmed computer. Specially programmed computers have been held to satisfy the *particular machine* prong of the machine-or-transformation test. Therefore, you can often overcome a §101 rejection by amending the claim to recite use of a programmed computer. Indeed, some examiners may even suggest that to you and will be willing to effect the change by simple examiner’s amendment.

However, there is a large pitfall that can prevent you from using this simple solution. The patent specification must include some mention, and preferably a significant mention, of the programmed computer. Adding “performed by computer” to the claim may be deemed an improper addition of new matter if there is no support for the programmed computer in the specification.

On a few occasions where this issue has risen to the Court of Appeals for the Federal Circuit, the judges held the view that a computer *per se* is a general purpose machine that does not satisfy the *particular machine* prong of the machine-or-transformation test. To convert this general purpose machine into a particular machine requires some programming or software. If the applicant does not explain in the specification how to effect such programming or how to engineer such software then there is no support for arguing the computer is a particular machine.

The way to avoid this pitfall is to show, at a minimum, a computer with processor, memory and applicable input/output circuits, and then provide some software engineering information that a software engineer would be able to use to construct the required software. A typical software engineering description might include explanation of the relevant data structures (describing what kinds of data need to be stored in memory and how the data are organized into the preferred schema) and explanation of the relevant processes or algorithms that operate on this data.

Pitfall 4: Manufacture claims that embody transitory signals

Under U.S. patent law, one may obtain a patent for a manufactured article. The courts have construed the manufactured article to include computer-readable media, but to exclude transitory signals. The CD-ROM containing computer executable code, or the RAM chip containing computer executable instructions are both considered statutory subject matter under 35 U.S.C. §101. A propagating signal carrying the same computer executable code or computer executable instructions would be deemed non-statutory under §101.

In view of these decisions, the USPTO is currently requiring applicants to express their manufactured article claims as being *non-transitory* computer readable media. A typical claim preamble for such class of subject matter might read:

“A non-transitory computer-readable medium encoded with a program for...”

Amending the claim to add language like the above usually presents no problem unless there is no support in the specification for the computer readable media, or unless the applicant has specifically defined the term media to encompass transitory signals.

Currently the USPTO is under direction from Director Kappos to allow applicants to amend their claim to add the non-transitory language.⁹ If invited by the examiner to do so, it is usually safe to comply, perhaps with the caveat that:

“non-transitory computer readable media” comprise all computer-readable media, with the sole exception being a transitory, propagating signal.

You may also wish to cite to Director Kappos, Subject Matter Eligibility of Computer Readable Media. Jan 26, 2010.

The pitfall that some applicants encounter is the failure to make any mention of a computer memory or computer storage medium in the specification. If there is absolutely no mention of such memory, the applicant runs the significant risk that any claim to a computer-readable medium would not be supported by the specification.

Pitfall 5: No support for means-plus-function option

⁹ Director Kappos, Subject Matter Eligibility of Computer Readable Media. Jan 26, 2010.

As we learned from Pitfall 1 above, USPTO examiners and the Board of Appeals are fond of wielding the “broadest reasonable interpretation” sword to strike down patent claims. The U.S. patent law at 35 U.S.C. §112, paragraph 6, provides the one exception where the examiners and Board of Appeals are not permitted to use this sword. The statute provides:

“An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.”¹⁰

So when confronted with a §101 rejection where the broadest reasonable interpretation has been brandished, consider introducing means-plus-function language as a fallback position prior to appeal. On appeal, the Board of Appeals is required to construe means-plus-function language based on the structure, material or acts disclosed in the specification. Very often this can help you avoid Pitfall 1.

However, in order to avoid Pitfall 1, you must avoid Pitfall 5: failure to provide adequate support for means-plus-function claims in the specification. This pitfall is most often problematic where computer-implemented methods are involved and the entire description in the specification tersely explains that the method is implemented using “software.” Several courts have held that the mere statement that “software” is used, without any explanation of how the software is actually configured, does not satisfy 35 U.S.C. §112, paragraph 6.¹¹

Bilski Reprise

Everyone from the USPTO patent examiner to the justices of the U.S. Supreme Court agreed that Bilski’s claim was non-statutory. Bilski sought to push the envelope and lost.

If Bilski could do it all over again, is there another approach he might have taken that might have gotten him a better result? The question is academic, but interesting. Let us take another look at the Bilski invention. For convenience, Bilski’s claim 1 (which was non-statutory) appears below.

1. A method for managing the consumption risk costs of a commodity sold by a commodity provider at a fixed price comprising the steps of:
 - (a) initiating a series of transactions between said commodity provider and consumers of said commodity wherein said consumers purchase said commodity at a fixed rate based upon historical averages, said fixed rate corresponding to a risk position of said consumer;

¹⁰ 35 U.S.C. §112, para. 6.

¹¹ *Biomedino v. Waters Techs. Corp.*, No. CV05-0042 (W.D. Wash. 2006); *Aristocrat Technologies v. Multimedia Games, Inc.*, 2007-1375 (Fed. Cir. 2008); *Finisar Corp. v. DirecTV Group Inc.*, 523 F.3d 1323 (Fed. Cir. 2008).

(b) identifying market participants for said commodity having a counter-risk position to said consumers; and

(c) initiating a series of transactions between said commodity provider and said market participants at a second fixed rate such that said series of market participant transactions balances the risk position of said series of consumer transactions.

According to the Bilski specification, it is exceedingly difficult to identify parties that have counter-risk positions, because the entire problem is highly weather dependent and the counter-risk parties may not necessarily live in parts of the country where the weather is the same. Bilski's Monte Carlo solution attacks this very difficulty by computing all permutations of energy deals using 20 years worth of historical weather data.

This suggests that one might rewrite Bilski's claim 1, expanding upon step (b) to demonstrate that a transformation of data representing real world, measured properties actually takes place. The data being transformed are the 20-years of historical weather data. These weather data are transformed into the identity of counter-risk consumers that comprise the perfect subjects to do a risk-hedging deal.

1. (amended) A method for managing the consumption risk costs of a commodity sold by a commodity provider at a fixed price comprising the steps of:

(a) initiating a series of transactions between said commodity provider and consumers of said commodity wherein said consumers purchase said commodity at a fixed rate based upon historical averages, said fixed rate corresponding to a risk position of said consumer;

(b) identifying market participants for said commodity having a counter-risk position to said consumers by:

(i) using Monte Carlo simulation to transform historical weather pattern data at a plurality of locations covering the geographic region where all potential market participants reside into a set of data representing substantially all permutations of deals between all market participants in the geographic region, and

(ii) performing one-tail tests on said data representing substantially all permutations of deals to calculate the marginal likelihood of losing money on each deal and selecting pairs of market participants associated with the deals calculated to have the least likelihood of losing money, and

(c) initiating a series of transactions between said commodity provider and said market participants at a second fixed rate such that said series of market participant transactions balances the risk position of said series of consumer transactions.

In claim 1 (amended) the heart of the invention has been enhanced to demonstrate that the identification of market participants is accomplished through a particular transformation of real world data. The amended language supports the argument that the claim does not preempt all use of an abstract idea.

Whether this change would have satisfied the U.S. Supreme Court is something we will never know. The amended claim has one thing going for it, however. It is much harder to say this claim preempts the very core of a fundamental principle or abstract idea. Indeed, this claim is tightly limited to Monte Carlo simulation and a specific one-tail algorithm and it no longer relies solely on risk flowing through its veins.

About the Author

Gregory A. Stobbs is a principal in the U.S. patent firm of Harness, Dickey & Pierce P.L.C. where he has practiced for nearly 30 years in complex technologies including speech recognition, computer networking and telecommunications, avionics, GPS, computer software, bioinformatics, automotive electronics, and mobile devices.

He is the author of three leading patent law treatises: *Software Patents*, *Business Method Patents*, and *Software Patents Worldwide*, and is also an internationally recognized speaker who has delivered presentations in Washington D.C., Tokyo, Europe, and China.

Mr. Stobbs has litigated matters in United States District Courts, the International Trade Commission and the U.S. Court of Appeals for the Federal Circuit and several times served as an expert witness. A computer virus detection patent he wrote won his client a settlement in excess of \$62 million.