

## The Death of Google's Patents?

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The Patent and Trademark Office has now made clear that its newly developed position on patentable subject matter will invalidate many and perhaps most software patents, including pioneering patent claims to such innovators as Google, Inc.

In a series of cases including *In re Nuijten*, *In re Comiskey* and *In re Bilski*, the Patent and Trademark Office has argued in favor of imposing new restrictions on the scope of patentable subject matter set forth by Congress in § 101 of the Patent Act. In the most recent of these three—the currently pending en banc *Bilski* appeal—the Office takes the position that process inventions generally are unpatentable unless they “result in a physical transformation of an article” or are “tied to a particular machine.”<sup>1</sup> Perhaps, the agency has conceded, some “new, unforeseen technology” might warrant an “exception” to this formalistic test, but in the agency’s view, no such technology has yet emerged so there is no reason currently to use a more inclusive standard.<sup>2</sup>

The *Bilski* en banc hearing attracted enormous attention, and yet there has remained a sense among many patent practitioners that the PTO’s attempts to curtail section 101 would affect only a few atypical patent claims. The vast bulk of patents on software, business and information technology are thought by some not to be threatened because those innovations are typically implemented on a machine—namely, a computer—and the tie to a machine would provide security against the agency’s contractions of § 101. Even if that view were right, the contraction of patent eligibility would be very troubling because the patent system is supposed to be designed to encourage the atypical, the unusual and the innovative. But that view is wrong.

The logic of the PTO’s positions in *Nuijten*, *Comiskey* and *Bilski* has always threatened to destabilize whole fields of patenting, most especially in the field of software patents. If the PTO’s test is followed, the crucial question for the vitality of patents on computer implemented inventions is whether a general purpose computer qualifies as a “particular” machine within the meaning of the agency’s test. In two recent decisions announced after the oral arguments in the *Bilski* case, *Ex parte Langemyr* (May 28, 2008) and *Ex parte Wasynczuk* (June 2, 2008),<sup>3</sup> the PTO Board of Patent Appeals and Interferences has now supplied an answer to that question: A general purpose computer is *not* a particular machine, and thus innovative software processes are unpatentable if they are tied only to a general purpose computer.

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<sup>1</sup> PTO Supp. *Bilski* Br. at 25 (argument section heading; initial capitalization omitted). See also *id.* at 6 (heading of argument section C.1, stating that “a Section 101 ‘process’ must either be tied to a particular apparatus or transform an article to a different state or thing”) (capitalization modified).

<sup>2</sup> *Id.* at 9.

<sup>3</sup> The decisions are available at, respectively, <http://www.uspto.gov/web/offices/dcom/bpai/its/fd081495.pdf> and <http://www.uspto.gov/web/offices/dcom/bpai/its/fd081496.pdf>.

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That stark answer should capture the attention of the many inventors and firms owning, or seeking to own, patents on innovative computer implemented processes, for the PTO's new interpretation of patentable subject matter provides a clear avenue to reject patent applications and to invalidate issued patents on all such innovations without regard to how meritorious or creative the innovation is. To understand the sweeping implications of this new position, we need only to consider how the PTO's position applies to the patent on Google's PageRank technology, which is surely one of the most famous and valuable of all modern software patents and which is now almost surely invalid under the agency's position.

### The Patent on Google's PageRank Technology

Google has constructed its web search technology using a "technology for ranking web pages" that the company refers to as "PageRank."<sup>4</sup> This patented technology was developed by Larry Page and Sergey Brin while they were attending Stanford University.<sup>5</sup> Stanford owns the patent, and Google holds a perpetual license on the technology that is exclusive through at least 2011.<sup>6</sup> The first claim of this important patent reads:

A computer implemented method of scoring a plurality of linked documents, comprising:

obtaining a plurality of documents, at least some of the documents being linked documents, at least some of the documents being linking documents, and at least some of the documents being both linked documents and linking documents, each of the linked documents being pointed to by a link in one or more of the linking documents;

assigning a score to each of the linked documents based on scores of the one or more linking documents and

processing the linked documents according to their scores.

U.S. Pat. No. 6,285,999 (filed Jan. 9, 1998, issued Sept. 4, 2001).<sup>7</sup>

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<sup>4</sup> Google Form S-1, Registration Statement (filed April 29, 2004) at 65.

<sup>5</sup> Id. at 67.

<sup>6</sup> Id. Google also stated in its SEC filing that patents are one of the legal mechanisms used to protect Google's proprietary technology and that the company "rigorously control[s] access to proprietary technology." Id. In light of these statements, made under pain perjury sanctions, there is no basis for believing anything other than that the PageRank patent is—or, in light of PTO's new positions, *was*—an extremely valuable piece of intellectual property.

<sup>7</sup> The other claims in the PageRank patent include no more connections to a machine than does the first claim. Twenty-seven of the twenty nine claims are directed to "computer implemented" processes that, like claim 1, have no limitation to a particular type of computer. Two claims (18 & 19) are directed to software-on-a-disk claims (so-called Beauregard claims), with the claim covering a "computer-readable medium" containing instructions for the PageRank scoring process.

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How does Google's patent fare under the position advanced by the government in *Bilski*? The first part of the government's test recognizes the patentable eligibility for processes that result in "a physical transformation of an article." Google's PageRank process seems to fail that part of the test, for the process merely generates a set of scores (which are merely numbers) that are then used to score or rank documents. The documents themselves probably do not qualify as physical articles under the government's restrictive test, for the documents are typically virtual webpages. Moreover, even if the documents would count as physical articles, they are not transformed; the process merely ranks them. The total output from the Google patent is just a mass of intangible data, and worse still it is intangible data about intangible documents. Simply put, there's no "physical," no "transformation," and no "article." Indeed, Google's process is even less physical than the process at issue in *Bilski*, which involved hedging the volatility in money flows. Dollars and cents seem real and physical enough for many people. If processes affecting money flows do not qualify as producing a physical transformation, it seems impossible to imagine that a process would qualify where it only scores virtual documents by virtual links to other virtual documents.

The second part of the PTO's proposed eligibility test is thus crucial. Unlike the patent claim in *Bilski*, which was not limited to machine implemented hedges, Google's PageRank patent claim expressly states that it is "computer implemented." But the government's test does not merely require a connection to a machine; it requires a tie to a *particular machine*.

On a recent panel held after the oral argument in *Bilski*, I raised the issue of Google's patent claim with Ray Chen, the lawyer who represented the PTO in *Bilski*, and he asserted that, under the PTO's position, the Google claim was probably still patentable.<sup>8</sup> But in light of the PTO's subsequent decisions in *Langemyr* and *Wasynczuk*, it is increasingly hard to see how Google's PageRank patent survives. Nor is that one patent an anomaly in Google's portfolio.<sup>9</sup> Indeed, other patents owned by Google include claims that do not even include a formal limitation to a computer.<sup>10</sup> Google might have thought that the patent system would surely

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<sup>8</sup> See Tony Dutra, *Bilski Opponents Renew Debate on Patentability Formalisms and Standards* (May 30, 2008) (reporting my debate with Chen on whether the PTO's position undermined Google's patents).

<sup>9</sup> See, e.g., U.S. Pat. No. 6,678,681 (issued Jan. 13, 2004) (setting forth a "computer implemented method of extracting information from a database"); U.S. Pat. No. 6,865,575 (March 8, 2005) (setting forth a "computer implemented method" for "using a modified index to provide search results in response to an ambiguous search query").

<sup>10</sup> For example, the first claim in U.S. Patent No. 6,526,440 (issued Feb. 25, 2003), which discloses an improved search engine technology, does not even expressly include the limitation that the process must be computer implemented:

1. A method of identifying documents relevant to a search query, comprising:

obtaining an initial set of relevant documents from a corpus;

ranking the initial set of documents to obtain a relevance score for each document in the initial set

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protect new technological developments that are highly creative and socially valuable. The PTO's new position proves that view mistaken.

### *Langemyr and Wasynczuk*

The patent claim at issue in *Langemyr* covers a “method executed in a computer apparatus” for producing a model of a physical system using a set of partial differential equations.<sup>11</sup> Even though Langemyr's claimed invention is more closely tied to the physical world than Google's PageRank technology is—Langemyr is, after all, modeling the physical systems rather than scoring virtual documents by their virtual links to other virtual documents—the PTO Board still had little difficulty finding that Langemyr's claimed process does not contain a “physical transformation” and therefore does not qualify as patentable subject matter under the first part of the PTO's test. The Board reasoned that the claimed process produced no “transformation of subject matter but merely an abstract mathematical expression that is created

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of documents;

calculating a local score value for at least two of the documents in the initial set, the local score value quantifying an amount that the at least two documents are referenced by other documents in the initial set of documents; and

refining the relevance scores for the documents in the initial set based on the local score values.

See also U.S. Pat. No. 7,222,299 (issued May 22, 2007) (claiming a new method for “detecting quoted text” that is not limited to computer implemented versions of the method).

<sup>11</sup> Claim 1 in Langemyr's application reads:

1. A method executed in a computer apparatus for creating a model of a combined physical system having physical quantities by representing physical quantities of the combined physical system in terms of a combined set of partial differential equations, the method comprising:

representing at least one of a plurality of systems as two or more selected application modes modeling physical quantities of said one of said plurality of systems;

determining a set of partial differential equations for each of the two or more selected application modes, parameters of the partial differential equations being physical quantities of corresponding ones of said plurality of systems;

forming said combined set of partial differential equations using the determined sets of partial differential equations associated with said one of said plurality of systems; and

outputting a model of said combined physical system based on said combined set of partial differential equations for the two or more selected application modes for the said one of said plurality of systems, whereby the model represents a mathematical expression of the physical quantities of the combined physical system.

*Langemyr*, BPAI Slip Op. at 2-3.

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from the previous steps.”<sup>12</sup> The process, the Board noted, “does not require any physical output into the real world.”<sup>13</sup> Precisely the same can be said of Google's patented process, which produces merely mathematical expressions—a set of ranks or scores—and lacks any physical output into the real world.

Thus for both Langemyr and Google, patent eligibility under the PTO's test comes down to the interpretation of the second part of the PTO's test. Both the Langemyr and Google patent claims are expressly limited to processes “executed” (Langemyr) or “implemented” (Google) on a general purpose computer, and the *Langemyr* decision holds that “the limitation that the method is ‘executed in a computer apparatus’ does not tie the method to a ‘particular machine.’”<sup>14</sup> The key flaw in Langemyr's claim, the PTO Board reasoned, was its general applicability to all computer: “Any and all computing systems will suffice, indicating that the claim is not directed to the function of any particular machine. ... Thus, the claimed method is not tied to ‘a particular machine,’ but rather is tied only to a general purpose computer.”<sup>15</sup>

In these crucial passages, the PTO Board has provided the foundation for rejecting and invalidating huge swaths of software patents, including not merely Langemyr's claims, but those of Google, Microsoft, IBM and many other companies. If we want to evaluate the PTO's ongoing attempts to constrict § 101, it does not seem an understatement to say that the constriction is truly breathtaking, given that the PTO's position pushes outside the patent system Google's PageRank patent, even though that patent covers one of the most widely known and commercially successful innovations of our era.

This is not, however, the end of the story. The PTO's decision in *Ex parte Wasynczuk* provides one final twist so Kafkaesque as to strain credulity.

As in *Langemyr*, the invention at issue in *Wasynczuk* relates to a “computer-implemented” process for modeling physical systems.<sup>16</sup> As in *Langemyr*, the PTO Board in

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<sup>12</sup> Id. at 21.

<sup>13</sup> Id.

<sup>14</sup> Id. at 22.

<sup>15</sup> Id. at 22, 24. The Board also rejected Langemyr's software-on-a-disk claim (Beauregard claims), explaining that it could “see no reason why placing instructions on a computer readable medium ... should be treated any differently from the method of claim 1.” Id. at 28.

<sup>16</sup> Wasynczuk's claim 1 reads:

1. A computer-implemented system, comprising:  
  
a first executing process that:

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*Wasynczuk* holds the broadest claim in the application to be unpatentable subject matter because “the sole structural limitation recited is the ‘computer-implemented system’ of the preamble” and that limitation “is not any particular apparatus” because the computer could be “essentially any conventional apparatus that performs the claimed functions.”<sup>17</sup>

Yet unlike in *Langemyr*, the application in *Wasynczuk* also included a narrower claim in which “the first simulating step [of the claimed process] is performed on ‘a first physical computing device’ and the second simulating step is performed on ‘a second physical computing device.’”<sup>18</sup> The PTO Board holds that claim to be patentable subject matter. The Board concluded that the collection of the two “physical computing devices” operating together “is ‘a particular apparatus’ to which the process is tied, not simply a generic computing device for performing the steps.”<sup>19</sup> Distribution of the process over *two* general purpose computing devices quite clearly seems to be the key to patentability in the Board’s view, for the Board emphasized that the narrower claim covered *only* the embodiment in *Wasynczuk*’s specification that “uses two computing devices” not the embodiment that “uses a single computer.”<sup>20</sup> In sum, an innovative process is not patentable when operating on a single computer processor but is when operating on two processors, even though the Board recognizes that the process in the unpatentable claim “is essentially the method” set forth in the patentable claim.<sup>21</sup>

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implements a first continuous-time model to simulate a first physical subsystem, the first model being programmed in a first language and having a first state variable; and

sends a first series of state-related numerical values, each numerical value reflecting information relating to the value of the first state variable at a different point *t*, in simulation time in the first model; and

a second executing process that:

receives said first series of state-related numerical values from said first executing process without said first series of state-related numerical values passing through a central communication process;

implements a second continuous-time model to simulate a second physical subsystem, the second model being programmed in a second language and taking as an input values from said first series of state-related numerical values; and

outputs data representative of a state of the second continuous-time model.

*Wasynczuk*, BPAI Slip Op. at 2-3.

<sup>17</sup> Id. at 25.

<sup>18</sup> Id. at 22.

<sup>19</sup> Id.

<sup>20</sup> Id. at 22.

<sup>21</sup> Id. at 25.

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Google's PageRank patent claim is of course not saved by the PTO's caveat that two computer processors are better one when it comes to patentable subject matter. The PageRank claim requires only computer implementation and is thus invalid under both *Langemyr* and *Wasynczuk*. But the *Wasynczuk* definition of "particular machine" opens up vast possibilities for future litigation. In an age when even simple laptops often contain multiple processors, many patent claims could be written as functioning on multiple "physical computing devices." Will such claims generally be patent eligible? Will dual core processors operating on a single chip (e.g., Intel's Centrino Duo® chip) constitute a "particular machine"? Or will the processors have to be physically separate chips or physically separate computers? Will the patent claims have to specify that certain steps occur only on one processor while other steps occur solely on the other? Will the result be different if the processors share steps to some degree? All these and many more fascinating questions will provide ample billable hours for patent attorneys even as inventors look on with utter horror and disbelief at the crucial importance the legal system is placing on distinctions that are technologically meaningless to the innovations sought to be patented.

### Requiem (?) for Google's Patent

The apparent death of Google's pioneering PageRank patent under the PTO's new rule for patentable subject matter may be a cause for celebration among those who are philosophically opposed to property rights in innovation and are eager to confine the patent system's ambit. It will surely be cause for mourning among those who believe that allowing patents on cutting edge technologies has served the country well for more than two centuries and that a radical departure from the traditional approach would be unwise. And it is likely to generate puzzlement among business people and innovators, who may wonder how agency decisions supposedly premised on the need for ensuring that "that the patent system be directed to protecting technological innovations"<sup>22</sup> have ended up rendering unpatentable innovations in search engine technology, computer modeling, bioinformatics and many other innovations in cutting edge fields related to software and information technology.

Undeniably, however, the pallor now cast upon Google's patents and many other software patents highlight the stakes in the Federal Circuit's pending en banc decision in *Bilski*. The PTO Board's reasoning in *Wasynczuk* also reveals that the agency's proposed new rule for patentable subject matter will not produce certainty but will instead open up software patents to new and previously unimagined litigation over the precise scope of the concept of a "particular machine." Vast industries of modern innovation must now wait to see whether the courts will follow the agency's lead.

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<sup>22</sup> *Langemyr*, Slip Op. at 8; *Wasynczuk*, Slip Op. at 12.