

# the *overlooked* patent



Sometimes inventors miss potential claims. Take the tower crane, for example. It meets the latest criteria.

*By Stephen Scanlon*

**E**ngineers frequently overlook the opportunity to reap profits when they develop and utilize new methods to tackle the challenges of their work. Although their efforts may develop a new approach to construction, these same innovative engineers sometimes fail to investigate whether their innovation is patentable. For instance, erecting a tower crane inside a stairwell is common practice today, but was patentable when it was new. The patentee could have demanded license fees from anyone erecting a tower crane at that location, and could have

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spotted infringers from miles away.

As an open vertical space at the core of a building, and also at the likely center of the job site, a stairwell can be an ideal location for a tower crane. This is well known to mechanical engineers familiar with ASME Safety Standard B30.3-2004, Construction Tower Cranes. That standard defines “climbing” as the process of raising a tower crane on or within a structure as the height of the structure increases. The illustrated examples include a braced climbing crane beside a building, and an internal climbing crane inside a building. The internal climbing crane is wedged against the floor slabs in a vertical space that could be a stairwell, elevator shaft, or any other suitable opening that reaches the height of the building.

The practice of locating a tower crane inside a stairwell was once what the law calls “novel and nonobvious.” Novelty and nonobviousness are two tests for patentability of an invention, but not the only tests.

A controversial new development in patent law limits the scope of inventions that can qualify as patentable subject matter. Some inventions face a newly imposed test for patentability even if they meet the familiar and customary requirements of being novel and nonobvious. This test, known as the “machine-or-transformation” test, is limiting, but not overly so. For instance, it would not have barred a patent for the process of erecting a tower crane inside a stairwell when that process originated. The new test should not bar patents for similar engineering processes today.

Section 101 of the United States Patent Act provides: “Whoever invents or discovers any new or useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor...” Although the word “any” appears twice in this definition of patentable subject matter, certain exclusions apply. Laws of nature, natural phenomena, and abstract ideas are fundamental principles that cannot be patented.

Newly invented machines, manufactures, and compositions of matter are physical entities. On the other hand, a newly invented process might simply be a fundamental principle, such as a mathematical process, which is not patentable. This exclusion has been applied frequently but inconsistently throughout the surge of software and business-method patents during the last decade.

Courts have thus employed differing patentability screening tests for process inventions encompassing fundamental principles. Recently, in the case of *In re Bilski*, 545 F.3d 934 (Fed. Cir. 2008), the machine-or-transformation test became the controlling rule of law for determining whether a process qualifies as patentable subject matter.

The benefits of a patent depend entirely on its wording. In each case, the patent begins as an application that a

patent attorney prepares in view of technical information provided by the inventors. The application describes the invention with reference to the drawings, and concludes with a list of claims that define the patented scope of the invention. The written description must meet the legal requirements of enablement and best mode.

“Enablement” means that the application must describe the invention well enough to enable a person of ordinary

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skill in the art to practice the invention without the need for undue experimentation. The “best mode” is what the inventors consider to be the best way to implement the invention. These two legal requirements ensure that the public will gain full knowledge of the invention when the patent expires twenty years after the application filing date.

In exchange for that information, the patentee gains the right to exclude others from practicing the invention defined by the claims.

Unlike the written description, the claims should not describe the invention. Instead, the claims should merely recite the elements of the invention. The goal is to recite only those elements that distinguish the invention from the prior art sufficiently to have the claims allowed at the United States Patent and Trademark Office. Elements unnecessary for allowance at the USPTO should be omitted because a patent is infringed only if every element of a claim is misappropriated by the accused infringer. Your patent attorney will thus draft your applications with the utmost care and attention to the claims so your competitors cannot profit from the invention without infringing the patent.

### THE BILSKI TEST

Understanding the landmark *Bilski* case will help engineers appreciate the potential value of their innovations. In *Bilski*, the invention in question was a method of hedging risks in commodities trading. The written description in the patent application explained, for

example, that a power plant buying coal from a mining company faces the risk that cold weather will unexpectedly increase the need to consume coal.

The claims in the patent application recited particular steps of “identifying market participants” having counter-risk positions, and “initiating a series of transactions” among the participants at fixed rates to balance the risks. The claims did not recite a computer or other apparatus for

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performing the steps, and the steps themselves had no effect on the commodity, whether it was coal or anything else.

According to the Patent Office, those steps merely manipulated an abstract idea and solved a purely mathematical problem. The claims were rejected for covering a fundamental principle excluded from the definition of patentable subject matter under Section 101 of the United States Patent Act.

On appeal, the United States Court of Appeals for the Federal Circuit affirmed the decision of the Patent Office. The court sought to distinguish between fundamental principles, which are not patentable, and practical applications of fundamental principles, which can be patentable.

Drawing from Supreme Court precedent, the Federal Circuit ruled that a claimed process can be patentable only “if it (1) is tied to a particular machine or apparatus, or (2) transforms a particular article into a different state or thing.” We thus have the Bilski machine-or-transformation test for patentability of process claims. The case and its test are headed to the U.S. Supreme Court.

On October 20, 1964, the USPTO issued U.S. Patent No. 3,153,486, entitled Tower Crane. This may have been the first patent directed to the location of a crane inside a shaft. The claims recite “a tower provided with means adjacent the lower end thereof for supporting it within a vertical open shaft of the structure being constructed.” The claims further recite an “elevating means associated with the lower end of said tower for raising said tower within the shaft as construction progresses.”

The Tower Crane patent has apparatus claims, which are infringed by anyone who makes, uses, sells, offers to sell, or imports the parts of the apparatus recited in the

claims. Those parts include the supporting means and the elevating means. Similar wording could have been used for a process claim to recite steps taken to erect the crane inside the shaft. One step could employ the supporting means to stabilize the crane against the surrounding columns or floor slabs. Another step could employ the elevating means to raise the crane as construction proceeds. Any unauthorized contractor performing those steps inside a shaft would infringe.

If the Tower Crane patent had included such a process claim, it would have passed easily, even if the Bilski test applied at the time. The steps of raising the tower would pass the machine test because they are tied to particular machines, namely, the crane itself and the means for stabilizing it against the building. The same steps would also pass the transformation test because they transform the unassembled parts of the crane into a tower.

### LOOKING FORWARD, AND UPWARD

The Tower Crane patent dates from an era before software appeared on construction sites. A hypothetical claim for the climbing process described in that patent would easily avoid the exclusion of abstract ideas under Section 101 of the United States Patent Act, either before or after the Bilski case. However, consider how the current process to erect a climbing crane could be patented under the Bilski test.

The ASME guidelines call for a climbing crane to be balanced before each climb, and to be plumbed while balanced after each climb. An innovative balancing process might calculate vertical moments from load or wind velocity data. If so, a patent claim for the process would recite mathematical operations that face the Bilski machine-or-transformation test for abstract ideas.

The machine test could be satisfied by steps that move the trolley along the jib to balance the crane at various working radii. The transformation test could be satisfied by steps that shift an unbalanced crane into a balanced condition, or that shift the crane from one balanced condition to another. The challenge is to tie the abstract ideas into practical applications that do not unduly limit the scope of the claimed invention for the purpose of infringement by competitors.

Process claims with greater reliance on mathematical operations will be more challenging to patent. But they can likewise comply with Bilski by listing steps taken in a particular engineering environment of machinery employed and results obtained. Innovative mechanical engineering processes will yield many such opportunities for the practical application of abstract ideas.

All too often, innovative professionals, including mechanical engineers, overlook the opportunity for a patent. The Bilski case and the debate surrounding it, should not preclude engineers from seeking out a patent attorney, who will readily draft claims that comply with the machine or transformation test while at the same time protecting the scope of the invention. ■