

Slow patent process hurts nanotech progress

Financial backers wary of 4-year filing period

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Just as it's getting traction spawning new companies and products, the hot nanotechnology sector is running into a roadblock at the U.S. Patent Office.

As the time it takes to process patent applications now averages almost four years, double the time it took in 2004, nanotech entrepreneurs are beginning to worry that their ability to raise money to develop products may be stifled.

"Clearly there's a danger," said Stephen Maebius, a partner in the Foley & Lardner law firm, of the patent application backlog. "If you cross a threshold and it's taking too long, potential financial backers wonder if what you have is patentable or not."

Maebius, along with Vahe Mamikunian, an analyst with Lux Research, co-authored a recent report that noted that nanotech-related patent applications have grown by an average 20 percent over the past few years, compared to just 2 percent average growth in general applications. The number of patents issued also grew by 20 percent a year until 2005, when they increased by only 4 percent, the report found.

Nanotech utilizes new tools and techniques to create materials at the molecular level.

Consider that if you're reading this article in the Tribune, the newsprint itself is about 100,000 nanometers thick. A nanometer is one billionth of a meter, and nanotech materials are 100 nanometers or smaller in size.

Alan Gotcher, president and chief executive of Altair Nanotechnologies Inc. based in Reno, Nev., whose firm is working with nanomaterials to improve battery performance, said he's been filing for nanotech patents since the late 1980s and the lag in processing them has become a problem recently.

"The impact is one of perception," Gotcher said. "When you don't get a response from a patent application filing, you don't know what else is going on."

For example, patent applications are published about 18 months after they're filed, Gotcher noted, which gives competitors information about your intellectual property before you have a patent protecting it.

"It gives your competition a clear view of what you're doing," said Gotcher. "It lets them modify their claims and sets the stage for future intellectual property fights. Having less than a timely response from the patent office is a big deal."

Maebius and Mamikunian also found that in recent years nanotech patent applications have become more complex. A decade ago, entrepreneurs had simpler notions about nanomaterials, Mamikunian said.

The situation is further complicated because nanotech isn't so much a new niche, like biotechnology, but rather a new approach to doing almost anything that's been done in other ways in the past. That's creating problems for patent examiners, Mamikunian said.

"Nomenclature is different in each field," he said. For instance, someone working in the optics field might refer to a product as a "three/five nanocrystal that emits light," while someone working in semiconductors might apply for a patent on a "quantum dot." But "that's two patents to cover what's exactly the same thing," Mamikunian said.

Bruce Kisliuk, director of a patent examining group at the patent office, said the agency does face a growing backlog across all areas.

"We have 700,000 applications in the pipeline," Kisliuk said. "Some are for nanotech, some not. This backlog isn't unique to nanotech."

Last year, the office issued fewer patents than usual because of an initiative to improve patent quality, Kisliuk said.

After years of being starved for resources, the office, which has had around 4,000 examiners, hired 1,200 new ones, bringing its total strength to nearly 4,800 examiners. Another 1,200 are due to be hired this year, he said.

"It's easy to be critical and come up with a solution when you're not the person who has to implement it," Kisliuk said. "We've been doing this for 200 years, and we think we're doing a pretty good job."

Examiners in many fields must become familiar with nanotech as it applies to their specialties and the office has implemented a new categorization scheme intended to direct patent applications to examiners with expertise in that field, Kisliuk said.

While nanopatents are getting more complex, that's also true of everything, Kisliuk said.

"Technology generally has grown more complex," he said. "A century ago a third of the patents we issued concerned bicycles."

Marc Ehrlich, a patent attorney for IBM, which holds more nanotech patents than any other company, said his firm is concerned at the general patent problem rather than just the nanotech aspect.

"The patent office has a plan and it's focusing on quality," Ehrlich said. "We want quality, but we don't need to sacrifice pendency to get it."

Early this year, IBM launched a program in cooperation with the patent office to create computer databases that will help companies filing for patents to do research and produce clearer applications.

Chad Mirkin, director of the nanotech center at Northwestern University, was identified in the report from Lux Research and Foley Lardner as ranking as the No. 3 individual holding nanotech patents in the U.S. He has 51 issued patents and more than 330 in the pipeline.

"It's terrible," Mirkin said of the backlog. "Some of our 330 pending applications go as far back as the late '90s."

While Mirkin said his most valuable, core patents already have been issued, the backlog complicates planning because inventors can't count upon timely processing of their applications. "It's also frustrating that the patent office is completely overwhelmed."

But he said bringing government agencies up to speed on nanotechnology makes more sense than creating new agencies to handle nanotech issues.

The impact of the backlog varies by industry segment, said Sean Murdock, director of the Chicago-based NanoBusiness Alliance. For nanoapplications aimed at health care, the lag isn't as great an issue because commercialization of new therapies is likely to take a decade anyway.

But for electronics and other industries where the shelf life of a new product may be only a few years or even months, it's a greater problem.

"For most of these companies, intellectual property is their main asset, sometimes their only asset, and to have uncertainty is problematic," Murdock said.

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