LOWER MAKEFIELD, Pa. - For inventor David Allen, developing high-tech Christmas lights - bulbs that last for decades, use little electricity and generate no heat - was the easy part.

But manufacturing and marketing the high-tech devices is giving Allen and his partner, Jim Bruno, the founders of Fiber Optic Designs, an object lesson in the perils of the global economy.

"I thought coming up with the idea and developing the technology would be the difficult thing," said Allen, the small company's president. "It turns out the hardest thing is protecting the invention and not letting other companies steal it."

The company produces Forever Bright Christmas lights, made from light emitting diodes (LEDs) that can be plugged into regular household electrical outlets without the need for resistors.

Allen's effort to enforce patents and protect his inventions from theft has led to lawsuits both in this country and in China, where a manufacturing company he hired to make the devices took the idea two years ago and patented it there as its own.

Whether Allen or other American inventors should know enough to obtain patents in China, where experts say intellectual property theft is high, is a debatable point, patent lawyers and academics say. Patents issued by one country generally are not recognized by other countries.

For his part, Allen says he could have done more and in hindsight blames himself for putting his company at risk.

The company, which continues to manufacture in China, expects to sell between 8 million and 12 million sets of its Forever Bright lights this holiday season. The light strings range in price from $15.95 to $29.95 for those that change color automatically.

Fiber Optic Design's move into the Christmas lighting business, which began four years ago, shows the ups and downs for American companies looking to manufacture in China because of low costs.

"We had read things about pirated technology in China and the theft of intellectual property there, but it's one thing to hear about it and another to have it happen to you," said Bruno, Fiber Optic Design's vice president.
Allen, who devised and patented a technology that allows LED lights to be powered by standard electrical outlets free of resistors, first turned to China and contracted with a manufacturer there in 2000 to make his Forever Bright lights for the 2001 Christmas season.

Where Allen made his mistake, he, patent and international trade experts say, was not patenting his technology and light designs in China.

"We had nondisclosure agreements and that's all we thought we needed since we weren't going to be selling the lights in China," Allen said. "We found out those agreements were worthless."

The company's dealings with Chinese manufacturing firms began well. As U.S. and Canadian sales of the LED lights grew, Fiber Optic Designs contracted with a second Chinese manufacturing company and then a third to increase production.

That third company, which Allen and Bruno refuse to name, liked Allen's design. In fact, it liked the design so much that in 2003 it filed an application for a Chinese patent on the lantern design of the covering of the LED lights.

Because Allen had never patented his design in China, the Chinese government issued a patent to the manufacturer, which then sued Forever Bright, along with its two other Chinese manufacturers, for patent infringement and attempted to stop them from making the LED lights.

"It seems crazy, but we were sued by a company that stole our idea and then tried to block us from making our own invention," Allen said. "I didn't think we had a need to patent the light covering. I didn't think there was sufficient invention involved to warrant a patent. Our U.S. patents are for circuitry, not for light coverings."

To combat the threat, "We had to meet the extremely high standards for having evidence introduced in Chinese courts to show we had our product on the market before the patent in China was issued," Bruno said.

To demonstrate prior invention of the lantern design, the company tried to submit a copy of The Times from December 2001, which carried a story detailing the design in question.

"The problem is, you cannot just submit the newspaper. They do not accept that as evidence," Bruno said. "You have to get a notary to attest that it is a genuine newspaper from the date in question," he said.

"Then, you need to get a state judge to certify that the notary is a licensed professional in good standing. Then, you need to get a state agency to certify
that the judge you used is, in fact, a judge. Then, you need to get the U.S. State Department to certify that the certifying state agency is legitimate. Then, you need to get the State Department to present the document to the Chinese embassy in Washington and you need to have the Chinese embassy certify that it received the document from a state department official that it recognizes as legitimate.

"If there is any break in this chain, the evidence is completely inadmissible," Bruno said.

"It took us eight months and many thousands of dollars to submit a single newspaper article. We wanted to submit a video recording from a local news channel that did a feature on us several years back, but we could not do that no matter how many people we got to certify it. Video evidence is not admissible."

Allen said the company spent about $50,000 to successfully overturn the patent granted to the Chinese manufacturer. He has since patented his LED lights in China.

Patent and international trade experts agree Allen could have avoided the legal entanglement by patenting his Christmas lights in China initially but are split on whether he should have taken that step.

"Obviously the safest course of action is to get patents anywhere you are doing anything with an invention to get the maximum protection," said Sabrina Safrin, a patent and international law expert at Rutgers-Newark School of Law.

"The problem is that's a lengthy and costly process," she said. "This company took a risk, which many companies do, in not getting a patent in every jurisdiction. In their defense, however, you would not expect someone to patent your invention in the country where your invention is being manufactured."

Andrew Mertha, an international trade expert at Washington University in St. Louis, took a harsher stance and criticized Allen. "If you're going to go into China, where intellectual property theft has improved some but remains rampant, you really need to be careful," he said. "This company didn't do its homework and take precautions."

Safrin and Mertha agreed that Chinese officials' decision to revoke the patent issued to the Chinese company is a step in the right direction and is a sign that China is beginning to respond to Western complaints about piracy of intellectual property.

"The ruling shows that the people making the decisions in China are getting a more nuanced understanding of patent law and the countries with whom they're dealing," Mertha said. "The biggest problem is there is little enforcement of China's own patent laws, so piracy remains a big problem."
Fiber Optic Design's legal wrangling has not come to an end. The company currently is claiming patent infringement and suing two American importing firms, including one in Minnesota that sells its LED Christmas lights to Target, one of the nation's largest retailers.

Attorneys for Fiber Optic Designs and Seasonal Specialties of Minneapolis say that case, filed in U.S. District Court in Minnesota, is early in the process and no trial date has been set.

Randall Skaar, an attorney for Seasonal Specialties, said his client's LED lights are substantially different from those made by Fiber Optic Designs, so there is no patent infringement.

Allen decided to get into the Christmas-light business about nine years ago shortly after wiring his entire house with traditional bulbs and finding that many of them didn't work properly. "I decided then that there had to be a better way to design Christmas lights," he said.

Over the next four years, he devised a way to make Christmas lights from light-emitting diodes, which burn longer and use less electricity than incandescent bulbs. By the 2000 season, he had hired a Chinese factory to begin making Forever Bright lights for the U.S. market.

Fiber Optic Designs is a privately held company and Allen and Bruno declined to disclose annual sales figures. The company has a license agreement with Holiday Creations of Denver to sell Forever Bright lights. Holiday Creations officials could not be reached for comment.

With an increasingly globalized economy, negotiators for various countries are working toward creating a worldwide patent system that could be enforced under the World Trade Organization, but as with other trade-related issues, progress has been very slow.

Some believe China's attitude toward patents arises from its history.

After Mao Zedong and the communists took over the country in 1949, they abolished most forms of private property and created a patent system that awarded all Chinese patents to the government and allowed Chinese people to use those patents however they wanted.

China has changed that system in recent years, but many Chinese companies still act as if the old system were in place. In just the past couple of years, a huge number of prominent Western companies like General Motors, Cisco, Sony and Pfizer, as well as nearly every movie studio and designer clothes makers, have complained about Chinese patent infringement.
Experts also have noted an increasing number of cases like the one faced by Fiber Optic Design, cases where a Chinese company patents a product that has been around for some time - then brings patent infringement charges against its inventor.

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