

H-P Chemists Hunt Violators Of Ink Patents

By Christopher Lawton

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CORVALLIS, Ore. -- A team of scientists and a phalanx of lawyers working on behalf of Hewlett-Packard Co. have one thing on their mind: ink -- specifically, competitors' ink.

H-P's ink-cartridge business acts as a powerful annuity for the company. The technology titan, which has a market share of 50% in the U.S. and more than 4,000 patents on its ink formulations and cartridge design, often sells its printers at a loss, then essentially locks customers in when they have to repeatedly come back to buy replacement ink cartridges. In fiscal 2005, H-P made more than 80% of its \$5.6 billion in operating profit from ink and toner supplies, according to Sanford C. Bernstein & Co.

To protect this franchise, increasingly under attack from rivals, H-P could sue any ink makers it suspects are infringing on its patents. This month, it sued China's G&G Ninestar Image Co., a cartridge manufacturer, alleging G&G had violated seven H-P patents in cartridge design. The complaint also targets four online retailers. H-P also asked the International Trade Commission to open an investigation against Ninestar. A Ninestar spokeswoman said the company had no comment.

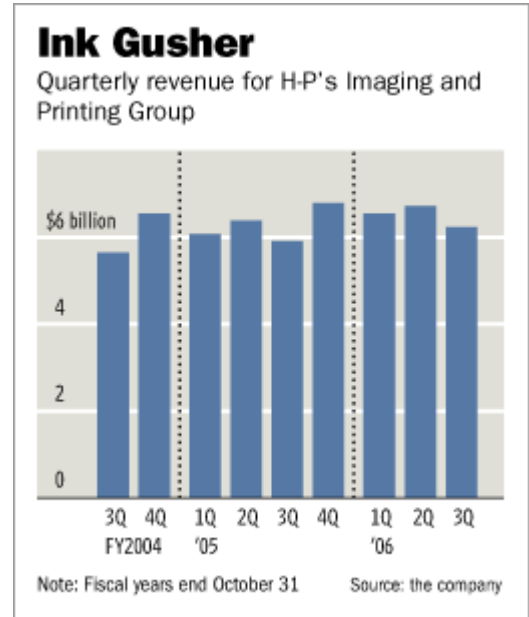


Fig. 1 – HP's income due to ink sales.

This latest suit follows other actions over the past year. In June, H-P said retailers Walgreen Co. and OfficeMax Inc. had infringed on H-P ink patents with ink used at in-store ink-cartridge-refilling stations; Walgreen and OfficeMax both deny the claims. Last year, H-P similarly warned the U.S. arm of Cartridge World Inc., a domestic retail ink-cartridge refiller; Cartridge World says it is working to resolve the issue.

New competitors such as Cartridge World, Caboodle Cartridge Inc. and Rapid Refill Ink International Corp. refill empty ink cartridges made by H-P and others, and sell them at discounted prices of as much as 50% off a new cartridge in locations such as malls or downtown stores.

"A lot of people come into the ink marketplace with some assumptions that there really isn't a lot of technology" in ink, says Tuan Tran, a vice president of marketing in H-P's printing business. "We want to remind them that there is a lot of technology that goes into formulations."

Such a reminder often comes in court, where H-P is used to defending its patents on various products. In 2003, it launched a wide effort to protect its intellectual property and profit from its 33,000 patents through technology-licensing deals. Its litigation strategy has been on the increase under Mark Hurd, H-P's chief executive since March 2005, who wants to improve the company's profitability. In fiscal 2004, H-P's patent efforts brought in around \$200 million in cash and product discounts.

H-P's ink studies often start with teams of people in its printing group around the world, who routinely collect all the inks they can get on the open market and ship them to an H-P lab here in Corvallis

for testing by LeAnn Bell, H-P's 37-year-old coordinator of competitive-ink testing, and her team of nine scientists.

Ms. Bell had just graduated from the University of Maryland, Baltimore County, in 1998 with a doctorate in chemistry when she was recruited by H-P. Having studied mostly substances that cause cancer, she was surprised that the company wanted her to study something entirely different: ink.

"I never thought about ink," Ms. Bell says. But H-P had thought about it a lot -- and was looking for someone with a background in chemistry to find a way to analyze inks from competitors to determine whether H-P patents were being violated.

Taking on the assignment, Ms. Bell spent her first years at H-P learning the chemical components of ink and chemical-testing methods from other chemists. She soon pioneered the application of a test known as capillary electrophoresis in the ink field. Using this test, an ink sample is put into an electrical field inside a thin glass tube, enabling the separation of charged components. The test helps create a chemical "fingerprint" of the ink, which Ms. Bell can compare with "fingerprints" of other inks.

When an ink sample arrives in Corvallis, Ms. Bell and her group of chemists store it and dissect all the samples. On average, she and her team test 50 inks in a two- to three-week period.

One chemist on the team typically runs up to 60 individual ink samples a day through a large machine that uses a method called gas chromatography. The machine heats the ink into a gaseous form, and detects what solvents are inside it. The solvents help indicate how the ink is made.

Then there is the "egg yolk" test, in which Ms. Bell puts a drop of colored ink on a petri dish and places a drop of black ink from a competitor's cartridge on top of it. If the black ink forms a perfect black dot on top of the yellow dot, much like an unbroken egg yolk, a high-quality ink is indicated -- perhaps an ink that infringes on an H-P patent.

By such means, the ink team concluded that InkCycle, a division of LaserCycle Inc. that made the ink for Staples, had violated two H-P patents that prevent colors from bleeding together in printouts. In March 2005, H-P sued InkCycle alleging patent infringement. InkCycle settled with H-P in June 2005 for an undisclosed sum and agreed to stop using the infringing inks.

More often than not, Ms. Bell says, she finds suspected infringements in the inks she tests. But she adds that she isn't sure that is indicative of the market, or just of the samples she receives in the mail. "My job is enforcing our ink patents so that we are all playing fair," she says. "It's the corporate version of CSI."

Write to Christopher Lawton at christopher.lawton@wsj.com
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