

Researchers accuse Apple of infringing on patent

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A thin piece of silicon lodged in the latest iPhone and iPad is at heart of a lawsuit the Wisconsin Alumni Research Foundation has filed against Apple Inc.

At issue is whether or not Apple used technology developed and patented by Gurindar Sohi and three other University of Wisconsin-Madison professors in its A7 processor to achieve greater efficiency and performance. Apple uses the A7 processor in the iPhone 5S, the iPad Air and the iPad Mini with Retina display.

WARF filed the suit in federal court in Madison on Jan. 31. This is not

the first time the patenting and licensing arm for UW-Madison has filed a [patent](#) infringement lawsuit related to this technology. WARF in 2008 accused Intel Corp. of infringing on the same patent. That resulted in a settlement in 2009 that had Intel paying an undisclosed amount in licensing fees.

The patent - which WARF calls the 752, for the last three digits of its number - has been recognized in the field as a major milestone in computer microprocessing, said Michael Falk, WARF's general counsel.

"The technology of the 752 patent significantly enhances the performance of a microprocessor, among other benefits," Falk said.

Apple did not return a reporter's phone calls.

In just seven pages, WARF's brief makes the claim that Apple has filed "one or more patent applications that cite the 752 patent as relevant prior art."

That may or may not mean WARF has a claim, said Nick Lindberg, director of engineering at the Milwaukee Institute, a nonprofit computational research foundation. Apple could be infringing on WARF's patent, or the Cupertino, Calif., company could have come up with a different way to accomplish the same thing, Lindberg said.

That question will not be answered unless Barbara B. Crabb, U.S. District Court for the Western District of Wisconsin and the judge to whom the case was assigned, decides to allow the case to proceed.

"That's impossible to know unless Apple is forced to show its cards," Lindberg said.

Sohi is an expert in this area who has "forgotten more about cache

management and instruction set processing than most people know," said Jay Bayne, executive director of the Milwaukee Institute.

The breakthrough Sohi and his colleagues had that became the foundation for the 752 patent was a method for cheating by executing instructions in a microprocessor out of order so that it can perform tasks faster, said Lindberg, who studied under Sohi in graduate school.

Before then, a processor had to run one instruction at a time in order. Working in an area called speculation, Sohi and the others created a predictor circuit that figured out how to run the instructions out of order and simultaneously, dramatically improving performance.

"What's novel about the patent is it aims to eliminate the use of speculation in instances with a poor history of success, thereby minimizing the costly penalties when guessing incorrectly," Lindberg said.

UW-Madison researchers named on the patent, filed in 1998, are Sohi, Andreas Moshovos, Scott Breach and Terani Vijaykumar. The 752 patent expires in 2016, so WARF could face a decision about whether to renew it.

"It's a financial question, not a technical one, whether WARF wants to renew the patent and continue the fight," Bayne said. "Apple's got really deep pockets so this will more than likely be a protracted process."

Apple has nearly \$140 billion in cash. The company sold 51 million iPhones and 26 million iPads, both all-time quarterly records, in its fiscal first quarter ended Dec. 28, and customers spent more than \$10 billion in the App Store in 2013, Apple told investors.

WARF, which has \$2.4 billion in its endowment, is seeking triple

damages, alleging in its lawsuit that Apple's infringement has been "willful, intentional, and in conscious disregard of WARF's right." The brief said the foundation needed to file suit because Apple has said it has a policy of not accepting or considering proposals to license technology from outside groups.

"It will be interesting to see how deeply WARF wants to pursue this because this patent has a fuse on it," Bayne said.

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