

Micro-Windmills Can Recharge Cellphones

Researchers at the University of Texas at Arlington have designed a miniscule windmill with a micro-generator that can be used to recharge mobile devices.

By Lucas Mearian
Wed, January 15, 2014

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[Computerworld](#) — Researchers at the University of Texas at Arlington [have designed](#) a miniscule windmill with a micro-generator that can be used to recharge mobile devices.

Smitha Rao, a university research associate, and J.-C. Chiao, an electrical engineering professor, designed the micro-windmills. The two have filed for a patent for the devices, which are about 1.8 mm at their widest point.

A single grain of rice could hold about 10 of the tiny devices, and the researchers believe hundreds of them could be embedded in a cell phone sleeve for recharging purposes. Once the sleeve is on the phone, a user would simply wave the device in the air or set the phone in a windy place to get the tiny propeller blades turning, allowing the micro-generators to produce electricity.

The windmills compared to a penny. The wind generators are about 1.8 mm at their widest point.

The researchers' work attracted the attention of Taiwanese electro-mechanical fabrication company [WinMEMS Technologies](#), which has the researchers brainstorming on designs.

"The company was quite surprised with the micro-windmill idea when we showed the demo video of working devices," Rao said in a statement. "It was something completely out of the blue for them and their investors."

The idea for the windmills was originally a blend of origami concepts and conventional wafer-scale semiconductor device layouts created so the complex 3-D moveable mechanical structures can be self-assembled from two-dimensional metal pieces using planar multilayer electroplating techniques.

"The micro-windmills work well because the metal alloy is flexible and Smitha's design follows minimalism for functionality," Chiao said in a statement.

Once WinMEMS became interested in the research, it started a relationship with UT-Arlington. Company representatives visited with the UT-Arlington team several times last year to discuss collaboration. An agreement between the school and WinMEMS allows UT-Arlington to hold the intellectual property rights to the micro-windmills while WinMEMS explores commercial opportunities.

WinMEMS Technology demonstrates the micro-windmills.

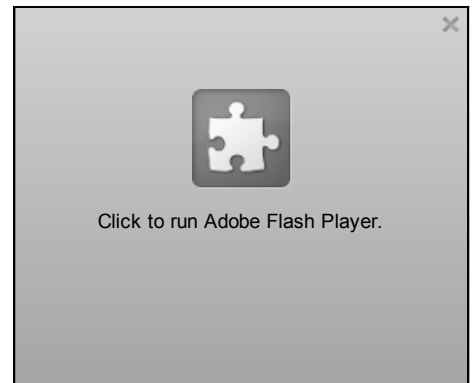
The micro-windmills include gears, inductors, pop-up switches and grippers. All of those parts are as tiny as a fraction of the diameter of a human hair.

"It's very gratifying to first be noticed by an international company and second to work on something like this where you can see immediately how it might be used," said Rao. "However, I think we've only scratched the surface on how these micro-windmills might be used."

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The micro-windmills were tested successfully in September 2013 in Chiao's lab. The windmills operate under strong artificial winds without any fracture in the material because of the durable nickel alloy and the aerodynamic design.

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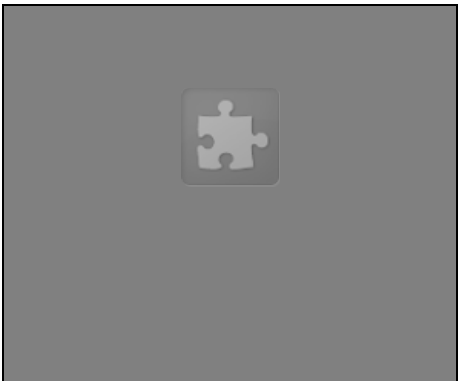
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ccocallas · 21 days ago
I think these are a great idea! Mount them by the phone's microphone, and users can charge their phones as they talk! :-D

DanAquinas · 21 days ago
Because these micro wind turbines have to be exposed to the elements to work, would not the dust and dirt floating around collect on the surface and start to clog up the moving parts? How fast before the power output drops 10%, 50%, or 90%? If they are put on the surface of the smart phone case, then one has to worry about oil and dander too.

Joel Fairstein · 21 days ago
These are wind turbines, not windmills. A windmill is something that grinds grain or pumps water..

buckfush → Joel Fairstein · 21 days ago
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