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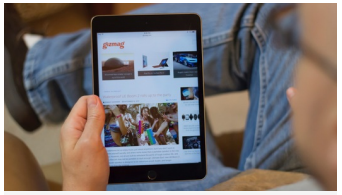
— WEARABLE ELECTRONICS

In-shoe device harvests energy created by walking

BEN COXWORTH AUGUST 25, 2011 6 PICTURES



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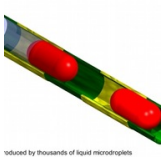
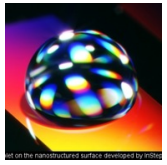
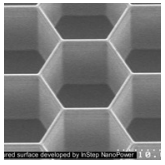
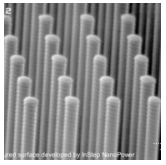
A new in-shoe device is designed to harvest the energy that is created by walking, and store it for use in mobile electronic devices

Image Gallery (6 images)

Although you may not be using a *Get Smart*-style shoe phone anytime soon, it is possible that your mobile phone may end up receiving its power *from* your shoes. University of Wisconsin-Madison engineering researchers Tom Krupenkin and J. Ashley Taylor have developed an in-shoe system that harvests the energy generated by walking. Currently, this energy is lost as heat. With their technology, however, they claim that up to 20 watts of electricity could be generated, and stored in an incorporated rechargeable battery.

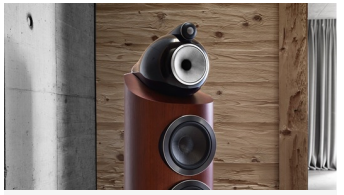





While the details of the energy-harvesting technology are proprietary, it is said to involve a process known as "reverse electrowetting," which was discovered by Krupenkin and Taylor. It converts mechanical energy to electricity via a

Amazon's new Fire TV supports 4K, ships in two flavors

World's largest delta 3D printer could build entire houses out of mud or clay

World's first 8K TV to go on sale next month



B&W rebuilds iconic 800 Series Diamond speakers from the ground up

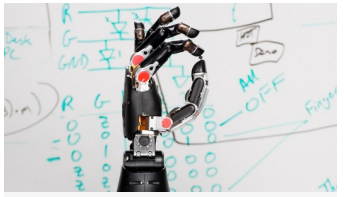
microfluidic device, in which thousands of moving microdroplets (of an undisclosed non-toxic, inexpensive liquid) interact with "a groundbreaking nanostructured substrate." The process is said to have a power density of up to one kilowatt per square meter (10.76 sq. ft.), plus it works with a wide range of mechanical forces, and is able to output a wide range of currents and voltages.

The battery is hermetically sealed, for protection against water and dirt. In order to get the power from it to the phone or other mobile device, the two would have to be temporarily physically joined with a wire, although the researchers are also looking into the use of conductive textiles and wireless inductive coupling.

Besides directly powering the phone, the device could also serve as a mobile WiFi hotspot, linking the phone to a wireless network. Having its own hotspot constantly nearby could drastically increase the phone's battery life - this is because the phone would only need to transmit in a low-power standard such as Bluetooth in order to reach the device, which would then use its own battery (which would be continuously getting recharged, by walking) for the high-power long-range transmissions to the network. Krupenkin claims that this could allow phone batteries to last up to ten times longer than normal.

The U Wisconsin technology is currently in the process of being commercialized,

Star Wars by Devon takes watches to the Dark Side



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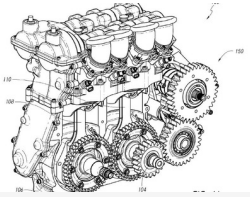

Can Dan Gurney's Moment-Cancelling engine breathe new life into internal combustion?

through Krupenkin and Taylor's company, InStep NanoPower. If it does make it to the marketplace, it may have some competition - Dr. Ville Kaajakari is also developing a piezoelectric device for shoes, that generates power as its user walks.

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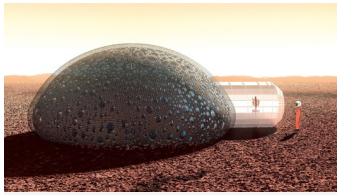

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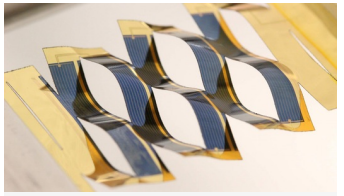


Kirigami-inspired solar cells twist to track the sun

About the Author

An experienced freelance writer, videographer and television producer, Ben's interest in all forms of innovation is particularly fanatical when it comes to human-powered transportation, film-making gear, environmentally-friendly technologies and anything

that's designed to go underwater. He lives in Edmonton, Alberta, where he spends a lot of time going over the handlebars of his mountain bike, hanging out in off-leash parks, and wishing the Pacific Ocean wasn't so far away.

All articles by Ben Coxworth

Tags

» Shoes » Energy » Piezoelectric » University of Wisconsin » Microfluidic » Walk

15 Comments

I mean this is good, and all that - but I am starting to hate tech and tech stories about bullshit devices...

They get to the point where they are clever applications and ideas - that become applied in stupid ways.

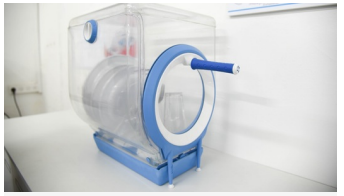
In almost all applications - power sources such as \"the grid\" based battery chargers, solar cells - in either the roof system, portable folding panels or top up units on the back pack seem to cover all bases.

Even when walking to the north or south pole with sled in tow - a portable 500gram wind generator and or fuel cell will keep a charge in the camcorder / satellite phone / GPS / tent light / torches.

It\'s crap like this - along with gravity activated pencil sharpeners, or See Through Time Amathyist Crystals from Atlantis...

A small 5 x 10 cm or 20 x 30 cm solar panel on the back pack, and only turn on the gear when you need it - I can believe and use that - especially is your on a

"The Alternative" puts the brakes on bullets fired from police sidearms



The Circo dishwasher has a handle on washing dishes

Victorian Prepper tiny house is ready for doomsday

10 day hike across the mountains - with no car etc near by.

But I ask \"Don\'t the people who ever make this crap - ever really think about this, and it\'s practical value being over ridden by it\'s irritation / draw backs / lack of real world use?

Mr Stiffy

Personally I think it\'s great, just think, when Batman needs his cape energised, lol....

livin_the_dream

Shoes that can recharge your cell phone sound like a good idea to me.

Slowburn

Run faster,I can not hear you!

Mike Thompson

What happens when the shoe wears out? They are not going to be cheap. A small solar cell seems like a better solution

windykites1

Finally! I really need this for my stillsuit. Now, if I can just find a reliable ornithopter...

Gurney Halleck

This isn\'t going to go over well with the TSA...

Zachary Cochran

Oh really - thought about this some more.

VR film-makers can register for GoPro's 16-camera Odyssey rig

Origami and the art of structural engineering

Aira jacket gives a massage on the move

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You mean people are going to go out and especially buy self charging shoes (= expensive and heavier), and

Then they are going to be walking miles every day (good idea), and

Then they are either going to take off their shoes and plug their mobile phones etc., into them, OR

Walk around with their mobile phones in their pockets and wires running down the inside of their trouser legs or bare legs if they have a skirt on (conjures up some interesting ideas) all the way down to a connector on the shoes.....

And I am thinking \"You really expect people to go along with any of that?\"

Power point and charger on the wall - or a small solar cell on the back pack - and while I am hiking through the mountains and it\'s freezing cold in the late afternoon - with dangerous tribes of Drop Bears in the trees, and you expect me to buy shoes that I have to take off to plug my mobile phone / GPS / torch into?

It\'s just not going to happen.

Mr Stiffy

The title should have been, \"In-shoe device helps wearers exercise by making walking less efficient\".

Humans do not have surplus energy to waste.

Pinhead

no not 20 watts! i;d believe 2, or 5, for short instants

i agree with Mr Stiffy :

seems like a solar cell would be a lot more convenient also it would not break,

Infento offers transformable transportation for kids as they grow

or have to be replaced when the shoes wore out

plus, the shoes would have to be to everyone;s liking and how likely is that? esp for hikers, etc - they like their OWN favorite shoes not these weird things

also who wants wires on their legs? or having to take off your shoes and fiddle with plugs, adapters, etc, to run or recharge some battery?

wle

wle

Re Pinhead People go to gyms, jog, bike, and etc. to burn off surplus energy.

It looks like an insole, so you can swop it between shoes.

If you assume a 2 inch square, and a 160 pound person that = a pressure of 40 psi ignoring impact loading. Given the weight of the average American twenty watts seams reasonable to me.

Slowburn

If you looked at the picture and are still making comments about the shoes wearing out. You're an idiot! it clearly shows that it would sit under the sole of the shoe, therefore making it as easy as changing insoles. And yeah it's a great idea, anything that keeps us from using power from non-renewable sources is great! You can never have too much power/energy. Humans give off so much energy that just goes to waste if it's not being used somehow or by something.

Joel Bauman

I see this as a big deal for cycling.

I am a long distance cyclist. I am usually pedaling at a 60 - 100 rpm cadence for anywhere from 3 to 10 hours at a time. While I am cycling, I am using a

multitude of electronic devices from my cell phone, to my cycling computer, to the led lights on the front and rear of the bike. I am already clipped onto the bike with my carbon fiber shoes so putting a quick disconnect say into the nose of the shoe of as part of the clip would not phase me a bit.

I see big promise.

Paul Kennedy

I think i can give a good reason why this project is not functinal,it sounds cool and all that but when you try to make something innovative you have to think everything e.x. why not a person just take one of those solar chargers and charge his phone or one of those battery chargers and just recharge the batteries at home.For these concept you don\'t don\'t know the price(expensive),the performance,the technology(if it can resists 80 kilos) and all the other thinkgs like target(who is it for?poor or rich?athletes or not?)anyway,what i am trying to say is why don\'t you put these idea in a car wheels ;) it will give 10x perfomance.It doesn\'t suck it need work.

Petros Hatillari

---

on the market yet?

Larry English

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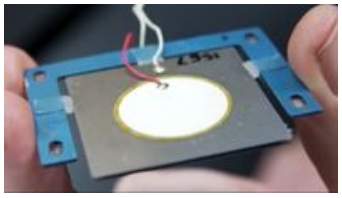

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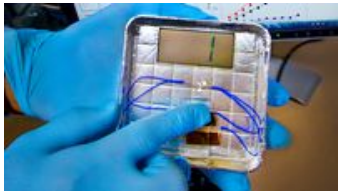

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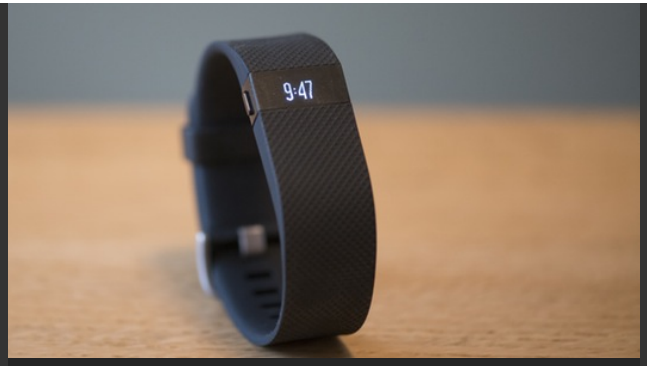

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