

<http://www.pocket-lint.com/news/12701/device-uses-human-kinetic-energy>

Device harvests energy from human movement

People power

by Katie Scott published on 8 February 2008

American and Canadian scientists have teamed up to invent a device that harvests energy from human movements.

The gadget looks like a knee brace but can generate enough energy to power a mobile phone for 30 minutes from 1 minute of walking.

It is being considered for use with prosthetic limbs.

Dr Douglas Weber of the University of Pittsburgh, who is one of the authors of the paper on the device told BBC News: "All of the new developments in prosthetics require large power budgets. You need power to run your neural interface; you need it to run your powered joint, and so on. Getting that power is going to be really important".

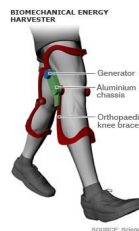
The device generates power using "generative braking", which is similar to the braking systems found in hybrid-electric cars like the Toyota Prius, says the BBC.

Max Donelan of Simon Fraser University in Burnaby, Canada, lead author of the paper continues: "Walking is a lot like stop-and-go driving. Within each stride muscles are continuously accelerating and decelerating the body".

"Hybrid electric cars take advantage of stop-and-go driving using so-called 'regenerative braking' where the energy normally dissipated as heat is used to drive a generator."

"We have essentially applied the same principle to walking."

Essentially, the brace uses gears, which assist



...cont.

the hamstring in slowing the body down just before the foot hits the ground, and therefore generates power. Sensors incorporated in the brace switch the generator off for the remainder of the step so that the wearer doesn't suffer too much strain.

Tests of the 1.6kg device produced an average of 5 watts of electricity from a slow walk.

"We also explored ways of generating more electricity and found that we can get as much as 13 watts from walking", adds Dr Donelan. "13 watts is enough to power about 30 minutes of talk time on a typical mobile phone from just one minute of walking." (This was with the device constantly switched on.)

This is not the only project to attempt to harvest people power.

According to the BBC, the US defence research agency DARPA has a long-standing project to tap energy from "heel-strike" generators implanted in soldier's boots and powered through the pumping motion of a footstep.

In 2005, US scientists presented an energy-harvesting backpack which used a suspended load to convert movement into electrical energy.

Simulations showed that a soldier carrying the pack and walking at a relatively brisk pace could generate around 7.4 watts of power. "It's about the same amount of power as [the knee braces] produce", said Dr Donelan.

The knee brace is hoped to be of use in creating "smart prosthetic" devices; or for people who have suffered a stroke or spinal chord injury who wear an "exoskeleton" to help them move, explains the BBC.

It adds: "Soldiers may also benefit from wearing the knee brace to power the multitude of devices they now carry, such as night vision goggles and

GPS".

For the meantime, however, the team is to concentrate on creating a lighter-weight, slimmer version of the knee brace.

Dr Donelan said: "That's about 18 months away, so it's not science fiction far in the future stuff".