

Are The Maleks Up False Creek? P.39

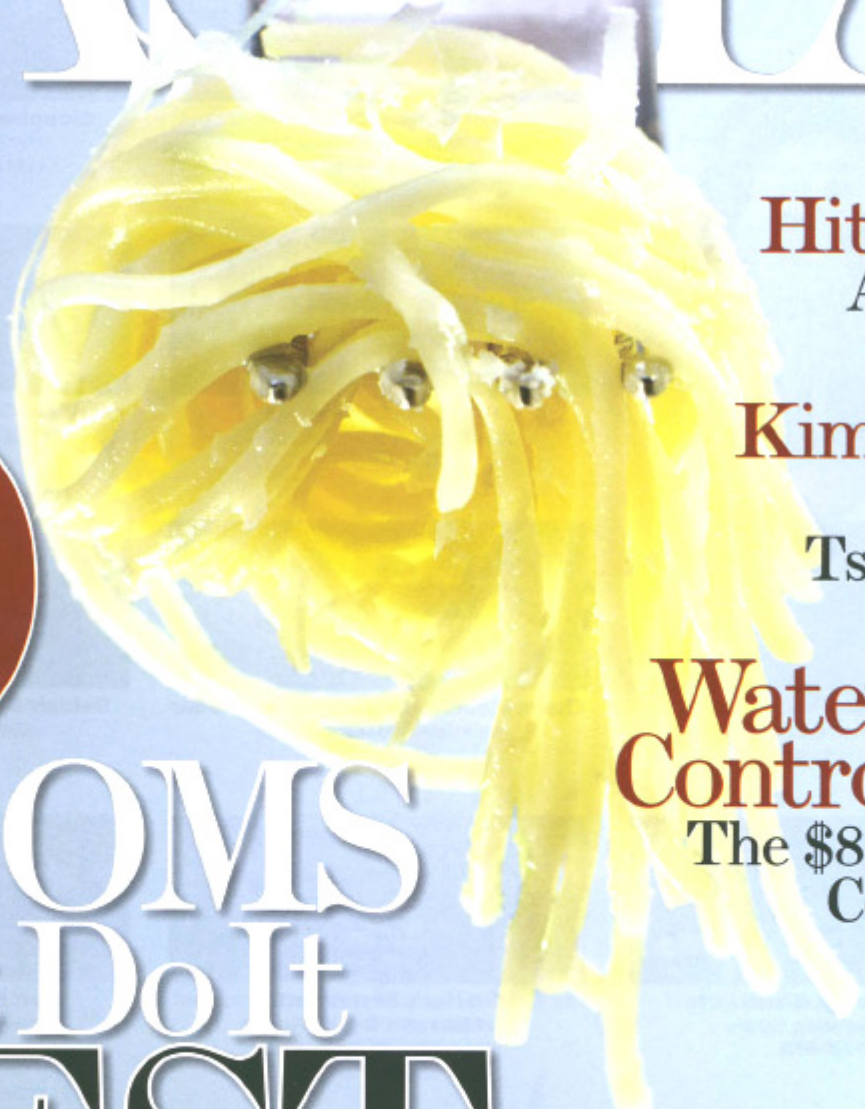
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Vancouver

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The
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ROOMS
That Do It
BEST P.85



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Max Donelan

Chief Science Officer,
Bionic Power

? Your invention, a knee-mounted energy harvester a decade in development, has been hitting the pages of the *Economist* and the *New York Times*. How does it work? When you're walking, at the end of the swing phase your knee is extended and your hamstrings are engaged. Now, if you were slowing the knee at that point with a generator instead of your muscles, you could produce electricity. The analogy is regenerative braking in hybrid cars.

How much power are we talking? The new rebuild will generate 10 watts when you're walking. A typical cellphone uses 500 milliwatts, so one minute of walking would power a cellphone for 20 minutes.

Who is it designed for? We're focused on people whose lives depend on portable power. Firefighters. First responders. Dismounted soldiers—they carry as much as 13 kilograms of batteries, depending how long they're going out. But batteries have only about one-hundredth the energy of the same weight of food. So a 10-gram granola bar and a one-kilogram lithium-ion battery carry the same amount of usable energy. You can't plug your cellphone directly into a granola bar, but with the harvester you can plug your cellphone into food, via you.

Are the Armed Forces interested? Some of our funding is from the Canadian military, and we'll deliver to them three field-testable prototypes by May. The build we finished in December we call our alpha, which is for internal purposes. The beta in May is to fix bugs. Likely, we'll then continue working with them, understanding their needs and context. It's R&D, so what I anticipate is, "Great job, you're nine-tenths of the way there, but please now work on these issues." You'd have to ruggedize it for military purposes.

Apart from military applications? In a disaster, your power grid goes down, your communications grid goes down, and first responders' lives can become endangered. Plus, how do you even have on hand enough batteries to supply a disaster when you don't know the scale of it? Or take biomedical devices. Prosthetic limbs these days are like wearable robots. They have computer chips, they have motors, they need power. If your battery runs out, you're stuck. Then there are drug pumps, defibrillators...

Will this eventually reach the consumer market? I was initially skeptical that anybody besides me would want to use it, but there are people saying, "Not only would I wear it, I'd wear it conspicuously." The 10 watts we can capture is a drop in the ocean—if you take global energy consumption and divide it by the world's population, we're at about 10 kilowatts per person. The impact is cultural: it's about changing behaviour. Just as there are people who want to be known to be driving a Prius, you'd have people who want you to know they're a walking hybrid.—*John Burns*

