MARKETPLACE

Shlomo Maital

Wheelchair to marathon

I HAVE RUN TWO MARATHONS: Boston and New York. The Boston Marathon took me over five hours. This is very slow – the current world record time for men is 2 hours, 3 minutes and 38 seconds, set by Patrick Makau of Kenya.

But the greatest marathon record by far, in my view, is the one set by Claire Lomas in London in May: 16 days.

It transformed Claire Lomas from just another paraplegic into a globally-known athlete

The reason it is amazing is that Lomas's legs are paralyzed. She was injured in a horse-riding accident and is confined to a wheelchair. But she was able to complete the full 26 mile, 385 yard London Marathon course on her own two feet thanks to an Israeli invention called ReWalk. It is an exoskeleton invented by Dr. Amit Goffer, an Israeli entrepreneur, and produced and sold by his company, Argo Medical Technologies.

Lomas started the marathon on April 22 with nearly 40,000 other participants. She walked from one to two hours a day for over two weeks and was the last person to cross the finish line. Weeping tears of joy, she was escorted by members of the Queen's Household Cavalry, their salute to her love of horses and her achievements as a show jumper. Marathon officials refused to give her the medal awarded to finishers because she took more than a day to complete the course, so a dozen other finishers gave her theirs. Lomas's feat transformed her into a national hero in Britain.

The ReWalk device is an external skeleton that uses sensors, software and a battery to replace paraplegics' own leg muscles. The idea has been around for at least 50 years but Goffer and his team were the first to make it work. Attached to the legs, it uses an electronic sensor worn on the wrist to move each leg forward when the user leans forward. Its battery power is carried in a small backpack and the electric motor that powers it makes an unobtrusive whirring noise. There are three modes to ReWalk: Sit, Stand and Walk – plus Ascend and Descend for stairs – controlled by a keypad worn on the wrist. ReWalk integrates software, electronics, physics, mechanical engineering and ergonomics – requiring state-of-the-art technology and knowledge in all those fields. Goffer built the earliest prototypes with his own two hands.

BAZ RATNER / REUTERS

ON HIS OWN TWO FEET: Paraplegic Radi Kaiof walks using a ReWalk exoskeleton at the development center near Haifa

Goffer has shown remarkable courage. A Technion graduate in electrical engineering, he worked for the Israeli medical imaging company Elscint before then starting Odin Medical Technologies – a company that produces real-time MRI images for brain surgery, sold in 2006 to Medtronic for $30 million. But Goffer had left the company by then, after a tragic accident in an all-terrain vehicle left him paralyzed. He could easily have descended into despair. Instead, his creativity will change the lives of thousands of disabled people worldwide. It will enable them to look at the able-bodied at eye level, upright.

"The number one benefit of ReWalk will be on users' self-esteem," Goffer told me. "ReWalk users will no longer be seen as disabled but as just another guy on crutches. It can improve their quality of life, health, acceptance by society, and ability to return to work."

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A few weeks ago, at a demonstration of ReWalk at the Argo offices in an industrial park in Upper Yokneam near Haifa, I watched a paraplegic Argo employee walk up a flight of stairs. Goffer estimates that 500,000 of the two million wheelchair users in the United States alone could benefit from ReWalk. With venture funding and 15 employees, he is marketing the device both in Europe and the U.S., where it received FDA approval in 2011. It is already used actively, for example, by the Villa Beretta Rehabilitation Center at Valduce Hospital in Italy, and by the US Veterans Administration's spinal injury center in the Bronx.

In the realm of start-ups, ideas are validated by competition. ReWalk already has a competitor. Jose Contréras-Vidal of the University of Houston has developed a pair of bionic legs that respond directly to signals from the brain.

There are two sad facts linked to this happy story. One is that Goffer himself cannot use the device he invented. His upper body is too weak. A second is that the Defense Ministry has been slow to embrace ReWalk, even though there are thousands of disabled soldiers who deserve it. The reason is doubtless the price, currently, about $70,000 per unit. That high price will tumble as economies of scale reduce the cost.

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