

## MARTIN BIONICS

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### Connecting to comfort

OKC firm pioneers new type of prosthetic socket for amputees

When Joshua Hodgson was 12 years old, he lost his right leg to cancer in an amputation high above the knee. He was fitted with a succession of prosthetic limbs that were often ill fitting and painful.

At first, he cushioned the hard plastic prosthetic socket that fit over his limb with eight or nine layers of socks. Then he acquired a socket that had a liner.

All were painful and cumbersome.

“There’s nowhere for your tissue to go, and when you start feeling pain there’s no way to relieve it,” Hodgson, 30, said of the experience of living more than two decades with a prosthetic limb.

Fast forward to 2018. Hodgson was recently hired as a technician for Oklahoma City-based Martin Bionics, a developer and clinical provider of prosthetic limbs. The new job also brought the opportunity to try a new style of prosthetic socket.

Founded by Jay Martin, a 42-year-old certified prosthetist, inventor and entrepreneur, Martin Bionics developed a pioneering new type of prosthetic that it markets as the “Socket-less Socket.”

Instead of being fashioned out of rigid molded plastic to fit over the limb of amputees, the Socket-less Socket fits more like a pair of sneakers and is made of flexible materials and can be tightened or loosened for a real-time precise fit.

Recently, I visited Martin Bionics at its new Bricktown headquarters at 214 E Main Street, where Hodgson had just been fitted with a Socket-less Socket.

Hodgson walked into a room on the second floor of the building as a team from the Oklahoma Center for the Advancement of Science and Technology (OCAST) and I were interviewing Martin about his innovation.

“I do not feel like I’m in a socket,” Hodgson said. “That’s the biggest shock for me. I’m used to being up against a hard, rigid shell.”

Jay Martin’s work in engineering revolutionary prosthetics designs dates back to 2002, when Martin worked as a clinical prosthetist at Oklahoma City’s Scott Sabolich Prosthetics and Research Center.

A Norman native, Martin was awarded his first research grant from OCAST. He founded Martin Bionics in 2003 and has been awarded multiple state and federal research grants in the years since.

Martin Bionics was named Oklahoma Innovator of the Year for advancing prosthetic design in 2008, the same year Martin sold his company to Orthocare Innovations.



Orthocare subsequently relocated its operations to Seattle, and Martin restarted a second generation as Martin Bionics Innovations in 2009.

The Socket-less Socket has its roots in work Martin did for NASA on a project to develop robotic “exoskeletons” for both astronauts in space and earth-bound military applications. Martin holds at least 15 issued or pending patents surrounding the socket technology.

“I began working with NASA in 2012 but had been working on fabric-prosthetic technologies for a few years prior,” Martin said. “The development of the Socket-less Socket is a compilation of years of experience and know-how in developing dynamic socket designs. Our earliest patents around this underlying know-how and technology date back to around 2005.”

Martin describes the new socket construction similar to an “Erector Set” or “Legos” that can be quickly assembled and fit to a user in a short period of time using simple hand tools. That makes the technology accessible to those who need prosthetics in the developing world.

As we interviewed Martin, he held a Socket-less Socket in one hand and a traditional molded plastic socket in the other to show the contrast between the traditional socket and his ground-breaking technology.

“Conventional prosthetic sockets are static, they are heavy, bulky and just really uncomfortable,” he said. “In our new technology, we have the ability to let the user micro-adjust the fit, kind of like a pair of sneakers. Every time they put it on it’s more conforming, more comfortable.”

Martin recently named Blake Gudel as his company’s CEO and expanded the role of Martin Bionics beyond its R&D role with the opening of a prosthetics clinic to fit users at the Bricktown location. Amputees from around the world are finding their way to Martin Bionics’ new clinic, he said.

“We have patients coming to us from the UK, from Germany, from all over the globe, to be fit with our ultra-comfortable socket technology,” Martin said. “There are amputees from the reaches of the globe who suffer from the same challenges.”

In fact, one was right down the hall in Josh Hodgson, who was taking his first steps in his new Socket-less Socket at the Martin Bionics office.

“I feel like I can have complete control in this, and I can move my socket any way I want and move my entire leg any way I want,” he said. “It feels free. That’s what’s amazing.”

[Read the article in the 7-17-18 Oklahoman](#)

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