Teen Invents
With Elders in His Mind and Heart

17-YEAR-OLD KENNETH SHINOZUKA CREATES MOTION DEVICE FOR ALZHEIMER'S PATIENTS **BY EDITH G. TOLCHIN**

I first learned of Kenneth Shinozuka in an article in the June/July 2016 issue of AARP magazine—not exactly where you would normally expect to read about a 17-year-old. But the whiz kid and Eagle Scout isn't your normal teenager.

The inventor of the SafeWander wearable device, which helps detect motion in Alzheimer's patients, has been a media favorite for at least two years. Shinozuka has given a Technology, Entertainment, Design talk in New York, been to the White House to meet President Obama, and has been written about in many magazines. He's been on "Good Day New York" and many other TV shows.

And what played a major role in this Harvard-bound teen's rise to fame? His love for his grandparents.

Edith G. Tolchin: Tell us about your background, family, and what inspired your invention.

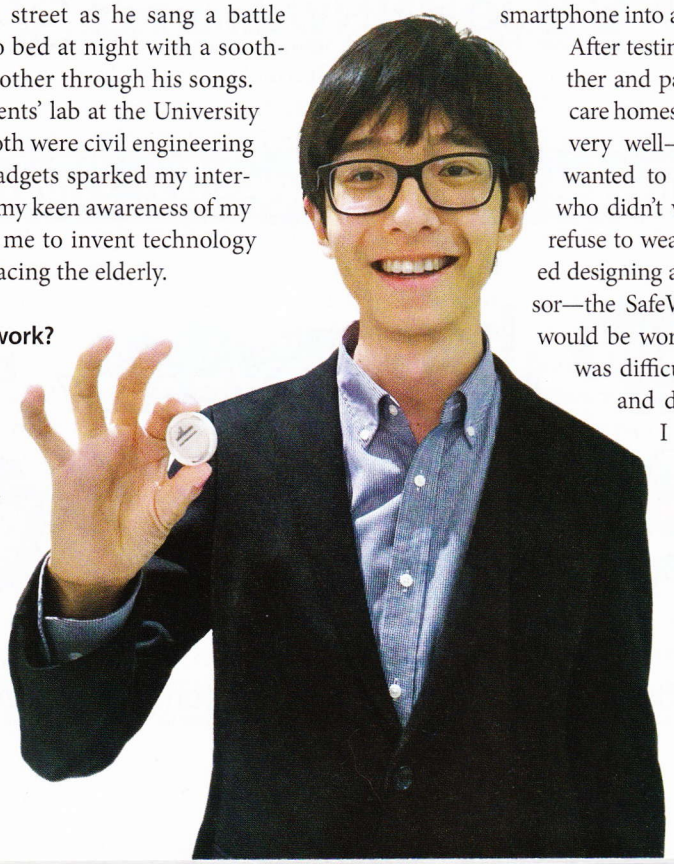
Kenneth Shinozuka: I was born in Newport Beach, California. I grew up in a three-generation household, so I was always very close to both of my grandparents.

I have two fond childhood memories. The first was singing with my grandfather. I'll never forget the times when we chased garbage trucks down the street as he sang a battle hymn, or when he tucked me into bed at night with a soothing lullaby. We bonded with each other through his songs.

The second was visiting my parents' lab at the University of California, Irvine, where they both were civil engineering professors. Tinkering with their gadgets sparked my interest in science and technology, and my keen awareness of my grandparents' health struggles led me to invent technology that could address the challenges facing the elderly.

EGT: How does the SafeWander work?

KS: SafeWander is a button that's attached to a patient's clothing through a secure cap-and-twist method. When the patient starts to rise from a bed or a chair, the sensor detects a change in body position and sends an alert to a caregiver's smartphone, no matter how far away the caregiver is.



EGT: Did you design the prototype?

KS: Yes. I also received help from my business mentor, Alan Kaganov, who is a partner at U.S. Venture Partners.

EGT: Has your invention been licensed, or are you manufacturing on your own? If so, where?

KS: I am manufacturing the sensor outside the United States. We would consider offers from companies that wish to acquire us or license our sensor.

EGT: What are some of the obstacles you've encountered? Has your age been an advantage or a disadvantage?

KS: I've been working on SafeWander for over 3 ½ years at this point and have encountered countless challenges since. First, I had to think of a way to alert my aunt whenever my grandfather wandered out of bed. When I decided that my monitoring system would include a pressure sensor attached to his sock, I had to create a sensor that was reliable enough to detect his wanderings, yet also thin and flexible enough to be worn on his heel; design and construct a wireless circuit that could be driven by a coin battery; and code a smartphone app that would turn my aunt's smartphone into a remote monitor.

After testing the sensor on my grandfather and patients in various small-scale care homes, I realized the sensor worked very well—but only on patients who wanted to wear socks to sleep. Those who didn't would take off the sensor or refuse to wear it. After these tests, I started designing a different version of the sensor—the SafeWander Button Sensor—that would be worn on the patient's clothes. It was difficult to think of a safe, secure and discreet attachment method. I initially thought of using Velcro or magnets, but neither could fasten the sensor tightly enough onto a patient's clothes.

One morning, I was screwing a cap onto a bottle of jam and had a "Eureka!" moment. I thought, why don't I use a ring that can

SafeWander is a button with a sensor that detects a change in body position and sends an alert to a caregiver's smartphone.

screw onto the sensor through the back of the patient's clothing? I also needed to create a range extender that could communicate with a caregiver's smartphone no matter where he or she is. To address this challenge, I built a Bluetooth-to-Wi-Fi gateway that gets plugged into an outlet next to the patient's bed, which relays the Bluetooth signal from the sensor to the smartphone via the Wi-Fi of the patient's home or facility.

And on top of all these technical challenges, I also had to commercialize SafeWander. After establishing a start-up, SensaRx, in the summer between my sophomore and junior years, I started selling the sensor on my website last December. I am currently starting two pilots at care institutions in California and New York to validate its efficacy in large-scale settings. During this entire time, I also had to go to high school (so I suppose my age was a hindrance), compete on my school's debate team, run a student publication, and head a Boy Scouts honor society chapter in Manhattan. Managing my time was certainly challenging.

EGT: Tell us about your TED talk.
KS: My TED Talk took place in November 2014. I was invited by a representative from TED, which was hosting a TEDYouth conference in Brooklyn.

EGT: Where has success from this invention taken you?
KS: I've been invited to conferences and TV shows on four separate continents. I'm incredibly fortunate and lucky to have received this level of attention from the media and various health/science organizations.

EGT: Have you invented any other products?
KS: I created two sensor prototypes—certainly not full-scale products—when I was 6 and 7 years old. The first was a Smart Bathroom that would send an alert to a caregiver's wristwatch when a patient fell down on the bathroom floor. The second was a Smart Medicine Box that would remind a patient to take the right medicine at the right time. I'm currently working on other products and extensions of SafeWander.

EGT: Do you have any advice for our inventor-readers?
KS: First, you don't have to be a genius to make an impact in the world. I'm more or less an ordinary kid, and if my ineptitude at opening doors the right way or following simple instruction manuals is any indication, there are lots of youth scientists who are way smarter than I am. I just happened to discover a passion in elderly care technology and found personal motivation to keep pursuing it through my love for my grandfather. Second, recognizing a problem in the world around you is the first step—and also a prerequisite—to creating a valuable solution. If you want to help the fight against cancer, observe specific, daily challenges that a patient with cancer has to face.

Details: safewander.com

PHOTOS COURTESY OF MARIA FENG

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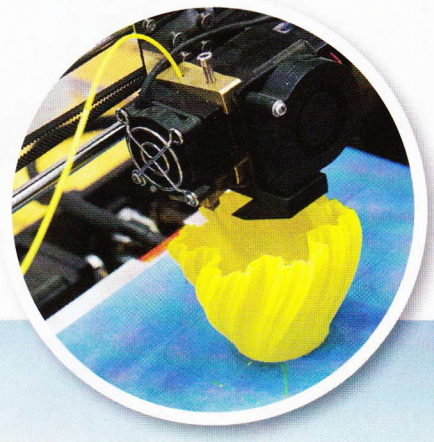

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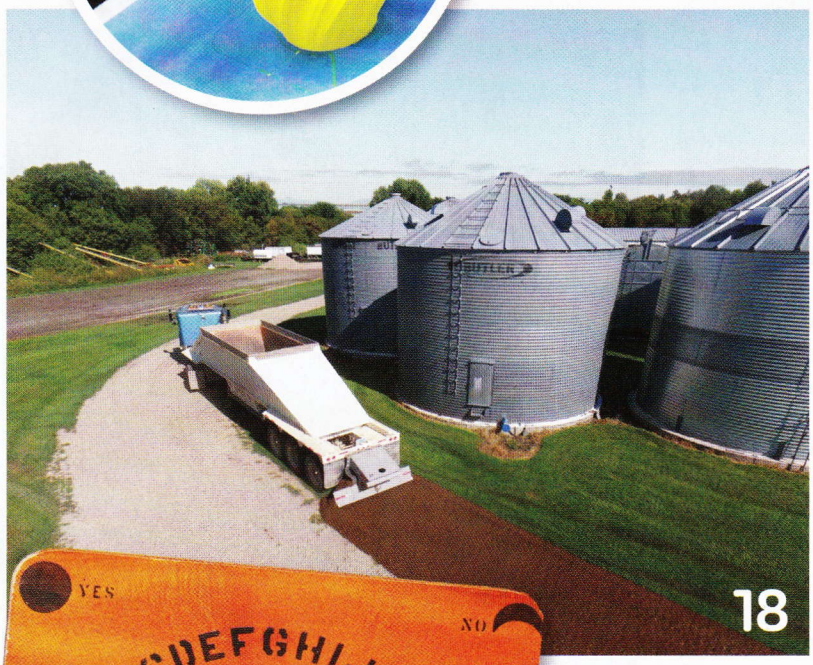

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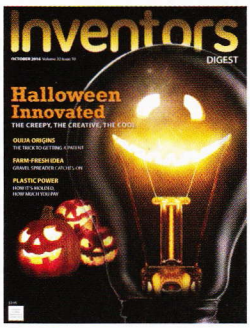

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Halloween; photo illustration by Jorge Zeggara

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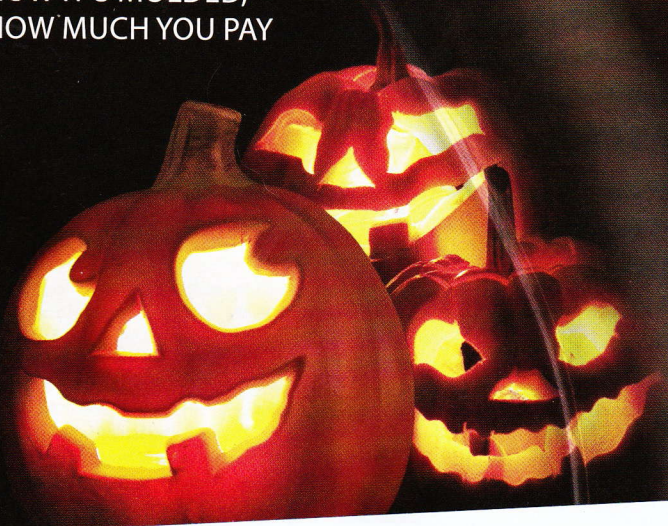

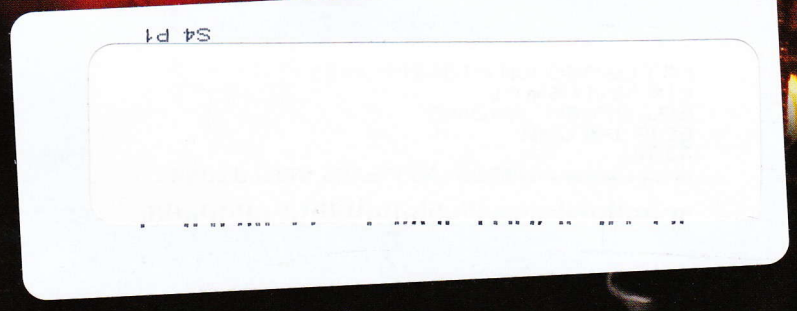

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