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Space-age tire invention

Bend native spins a new career

Young designed an airless bike tire after an internship with NASA; consumers can ride around on the space age technology in 2022

Bend native Calvin Young adapted the Mars Rover tires into airless bicycle tire. Submitted

BY MICHAEL KOHN
The Bulletin

Growing up in Bend, Calvin Young had all sorts of interests. He was passionate about science, math and music. Later he pursued philosophy. Engineering was never really part of the picture.

Then a chance encounter while working at a coffee shop in Portland introduced him to the world of engineering, and his inventor spirit was unleashed. Today he's producing his very own space-age tire invention that he hopes will one day replace inner tubes and make flats a thing of the past.

Young's invention, the METL tire, is modeled on the same technology developed by NASA for rovers to be used on missions to Mars or the moon. Young thought the sturdy tire has Earth applications too and during the summer of 2018 came up with a design that would work for bicycles.

The METL tire is non-pneumatic, that is, it doesn't require air. It holds its shape thanks to tightly woven interlocking springs. The metal springs are encased in polyurethane, and a durable outer tread adheres to the tire.

Non-pneumatic bicycle tires — also called airless tires or flat-free tires — already exist but are not widely used because testing has proven most brands to be too stiff compared to regular tires with air.

Young, who graduated from Summit High School in 2007 and Portland State University in 2012, was likewise not satisfied with what was available on the market.

"They tend to do a poor job absorbing bumps on the road," he said.

Then came summer internships at NASA's Glenn Research Center in Cleveland in 2017 and 2018. He was working with engineers on designing wheels for rovers. The type of tire being developed was airless and uses a shape-memory alloy that springs back to its original shape after being deformed.

"Colleagues suggested that I take it further and explore new applications," said Young.

Young set about creating a new tire that he could fit on his commuter bike, a single-speed Schwinn he bought in Bend years earlier.

"I decided it would be the perfect test rig for a new design," Young said. "The process involved a lot of hands-on experimentation, and there was an 'aha!' moment halfway through when I realized I had hit on a working design."

Young applied for a patent for the tire. Two other NASA engineers, Colin Creager and Santo Padula, were also credited as co-inventors for their work on the rover tires that opened the door to Young's bike tire invention. The patent for the tire drew the attention of two entrepreneurs, Earl Cole and Brian Yennie. The pair had already created a company called Smart Tire with the intention of bringing new designs to market. Young's design was a perfect match.

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