



DEPARTMENT OF THE AIR FORCE
TECHNOLOGY TRANSFER AND TRANSITION



AIRMAN'S "SMALL" IDEA MAKES MONUMENTAL IMPACT FOR THE DAF

Joint Base Andrews AFB, MARYLAND – No solution, no matter how seemingly small, is without value to the Department of the Air Force (DAF) and the Department of Defense (DoD). However, the “small” solution this patent provides came about because of Airmen having difficulties performing a valuable task due to having large hands.

Powered Systems Support Mechanic Jonathan Rajski with the 316th Civil Engineer Squadron (CES) has had a lot of experience working with Barrier Arresting Kit (BAK) 14 retractable hook-cable support systems, which are used on runways in conjunction with BAK-12 aircraft arresting system. BAKs are extremely important tools in stopping aircrafts by absorbing the energy of their forward momentum during a landing. They can also be lifesavers in the event of an aborted takeoff attempt.

Rajski and many of his fellow Airmen had also encountered a common problem when attempting to remove the bracket for the arresting rope.

“It’s the first thing off and the last thing on when we’re doing maintenance on the arms. The issue we continuously had was screws dropping due to the inability to have positive control,” Rajski said.

This problem was magnified when Airmen with larger hands were tasked with this procedure. There simply wasn’t enough room for them to maneuver their hands. Adding to the difficulty was the demand for a quick turnaround time to minimize downtime on the runway.

“For example, we were out there this morning and replaced an arm, one of 20 across each end of the runway, and we were asked by the control tower to expedite off the runway. I normally ask for a five- or 10-minute heads up for any air traffic, but sometimes the air traffic controllers just say you’ve got to go (now). We had to pull everything and get out of there really quick,” Rajski explained.

TECH SNAPSHOT

PATENT NUMBER:

US D958,619

TECHNOLOGY NAME:

Barrier Wrench

INVENTORS:

Jonathan Rajski

TECHNICAL PROJECT OFFICE:

316th Civil Engineer Squadron

SOURCE:

US Patent and Trademark Office

www.uspto.gov

The 316th CES Power Production Airmen introduced a potential solution by developing a bent box end wrench in 2017. However, Rajski said this fix also had its limitations.

“This worked so long as you could thread the locknut onto the screw and then proceed to tighten down. It was not easy, and you needed smaller hands and great dexterity to accomplish this.”

This issue could lead to instances of Foreign Object Debris (FOD) on the airfield in addition to additional man hours on the airfield and the need for more supplies; all proving very costly to the DAF and taxpayers. All these issues got Rajski thinking on a potential solution to the problem, which is something he says he’s been doing since he was a child.

“I always used to take things apart as a kid,” he said. “Growing up, my neighbor was building a four-seater plane in his garage. I’d go over and bug him.”



Ever the problem solver, Rajski began sketching up designs for a new barrier wrench, but he had no idea how to fabricate or test it. During that time, he discussed the idea with TSgt Bryan Hunt (316 CES), TSgt Logan Wisnoski (10th Missile Squadron), SSgt Eleuterio Flores (317th Recruiting Squadron), and SSgt Gerald Hokkanen (765th Air Base Squadron). It was by chance they happened to notice new activity in a repurposed location on base. Curiosity got the better of them, leading to United States Patent #D958,619 S: Barrier Wrench.

“We had this brand-new (AFWERX) Spark X-Cell that opened here. So, we thought we’d go over there and start asking some questions. We brought an idea and one thing led to another,” Rajski said.

He approached AFWERX with his designs, hoping to get a 3D printed version of the wrench. That initial conversation led to a mercurial experience, putting Rajski in contact with the right people with the skills to turn his concept into a tangible reality.

“AFWERX were extremely excited to have us in there and started brainstorming with us. They were very helpful. It’s amazing how it all tied together with all the different career fields on base,” Rajski explained.

It was through this meeting the team was introduced to MSgt Caleb Jones, who Rajski said fine-tuned the designs. From there, the team fabricated a 3D model and ran tests to make sure the

wrench would work. They discovered this new wrench will save the DAF 544 man hours annually and an untold amount in lost parts and FOD costs.

The team then connected with the Air Force Research Laboratory (AFRL) and the Air Force Materiel Command (AFMC) Intellectual Property Law Division (LOJAZ), which got the patent process rolling. It was three months from the time Rajski and his team approached AFWERX to the time the patent application was sent.

The team was elated to learn their idea and hard work focusing on this problem had earned them a patent. It was something Rajski never dreamed he’d have to his credit, but he considers it a part of his duty to the DAF.

“I think everyone enjoyed going through the experience. We knew we were helping the Air Force. It’s the small things that make a big impact. At the end of the day, we’re here to serve. If I can make something better or easier, that’s what I’m going to do. I think the patent process was the reward for wanting to look for ways to improve,” Rajski said. “I never thought about it, and it wasn’t something I ever thought I would seek out. I always just look for ways to improve or make things better. If that’s inventing and getting a patent, so be it.”

