PATENT
TECHNOLOGY SUMMARY
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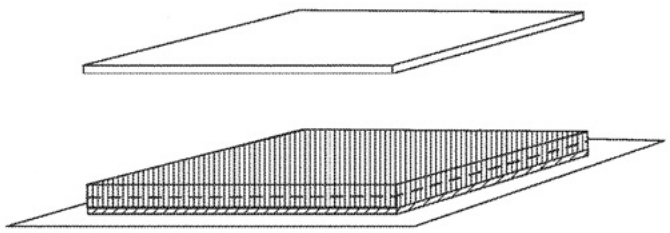
A Simple Question Leads to Seventh Patent for AFRL Physicist

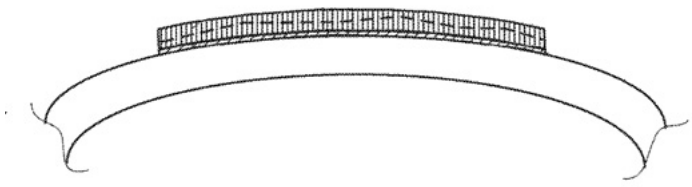
Sometimes a simple question can lead to a great idea that grows into improved technology. Joshua Lentz, Ph.D., of the Air Force Research Lab Munitions Directorate (AFRL/RW) at Eglin Air Force Base in Florida, just happened to be the person to ask such a question, which led to a patent involving photonic crystals.

"A photonic crystal is a generic term for an engineered optical material that has a repetitive structure just like a crystal," Lentz said. "There is no limit to the number or types of materials used, the number of layers, the size and shape of the repeating features, and there are some very interesting optical responses that can be created by carefully designing such a crystal."

Lentz had been contemplating utilizing photonic crystals as something similar to window tinting. Was it possible to attach them to existing materials such as glass or plexiglass to enhance how they're used?



An isometric view of an example flexible photonic film sans backing of the flexible photonic film assembly after application to the flat transparent surface.



A side view of the example flexible photonic film adhered to a curved transparent surface.

TECHNOLOGY

PATENT NUMBER:
US 11,372,134 B2

TECHNOLOGY NAME:
Peel-and-Adhere Photonic Crystal

INVENTOR:
Dr. Joshua Lentz

TECHNICAL PROJECT OFFICE:
AFRL Munitions Directorate

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www.uspto.gov

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Though he thought the idea was too simplistic to be patented, Lentz – an experienced physicist currently working on his doctorate in Intelligent Systems & Robotics -- decided to get someone else's opinion.

"While participating in an Innovation Discovery Event (conducted by TechLink) for another one of my concepts, I asked one of the panel members if a 'peel-and-adhere' photonic crystal concept would be patentable for a generic photonic crystal. His response was positive, (so) I filed the invention." Lentz explained.

While benefits to the average consumer would vary depending on what designs were available and at what cost, the invention would have a more practical use in laboratories. Being able to modify optical elements by placing a photonic crystal film that could be applied to existing materials to enhance their properties in a matter of minutes would save a great deal of time in the long run.

The entire timeline for preparing this patent idea was literally a matter of a few weeks of Lentz thinking about the idea, a few minutes of asking about it, and a couple more hours of writing up the disclosure. Having a total of seven patents to his credit, he's become very familiar with each step.

Though this invention didn't involve other collaborators, Lentz credits the culture of problem solving at Eglin for equipping him with the right mind frame to propose solutions.

"Experience working in the Air Force test and evaluation community on Eglin gave me an intimate understanding of how certain systems works, what their limitations are and what needs to be improved for the future of hardware-in-the-loop testing. Problems motivate solutions, and at some point, when technology cannot provide through incremental progress, innovation is necessary to make a more substantial advance," he said.

In his spare time, Lentz stays active playing sports, doing CrossFit, hiking, paddleboarding, gardening, and reading. He says those activities, along with his faith, have contributed to his overall physical and mental wellness to better serve the warfighter.

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