



Science and Technology

INFRASTRUCTURE RESILIENCE & SECURITY

WING-TO-FUSELAGE CUTTING APPARATUS

A TOOL TO PRECISELY AND SAFELY CUT WING-TO-FUSELAGE ATTACHMENTS TO PREVENT CORROSION DAMAGE ON AIRCRAFT

Corrosion damage between contacting surfaces, also known as fretting, occurs on aircraft between the primary wing and the fuselage. Load stress and vibration between the two components degrades the quality of the surface, reducing the reliability and safety of the aircraft. Manual filing with tools like draw files and hand-held grinders can repair fretting and eliminate interference, but the limited control of these methods can potentially damage the airframe. Removing the wing from the aircraft body for repair prevents airframe damage, but this approach is expensive and time consuming.

The wing-to-fuselage cutting apparatus addresses these maintenance challenges for wing-to-fuselage attachments. The apparatus mounts to the aircraft and allows an operator to fine-tune the allowed depth, width, and length of material that can be cut. The tool enables safe and accurate repairs that alleviate contact fretting in a timely and cost-effective manner, without needing to remove the wing from the aircraft.

KEY BENEFITS

- + Removes wing-fuselage contact damage
- + Allows for repairs with a variety of cutting tools
- + Enables precise operation
- + Saves time and cost by simplifying repair process

STAGE OF DEVELOPMENT

Proven System

PARTNERSHIP SOUGHT

License

INVENTORS

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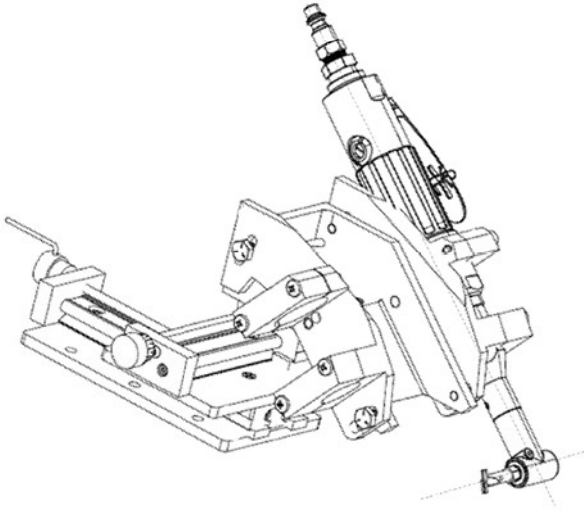
DHS COMPONENT

US Coast Guard

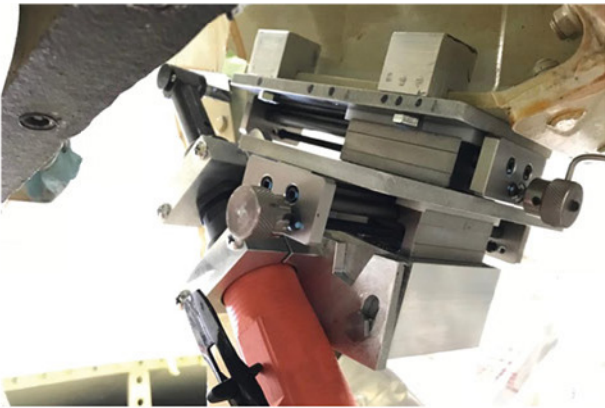
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THE TECHNOLOGY

The in-situ cutting tool sits on a mounting plate attached to the affected aircraft wing. The mounting plate holds a linear bearing to provide movement in one direction, while a second mounting plate provides movement in a perpendicular direction. The milling tool mount sits within a circular bracket that can be rotated forward and backward to adjust cutting depth. An operator can secure the linear bearings to maintain a consistent position while guiding the milling tool along the targeted cut path.



The illustration shows the cutting tool with two linear bearings, the second placed on the other in a perpendicular fashion. A bracket on top of the second linear bearing holds the milling tool of choice.



The wing-to-fuselage cutting apparatus mounted to an aircraft, ready to be used.

APPLICATIONS

The technology targets the following potential use case:

- + Fixed-wing aircraft repair

PATENT INFORMATION

US Patent numbers 11,052,501 and 11,446,779



CONTACT INFORMATION

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TECHNOLOGY SOLUTIONS

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