Passively Powered Device For Lift Enhancement

Tech ID: 33958 / UC Case 2025-785-0

BRIEF DESCRIPTION

This invention introduces a unique rotor design for lift enhancement and wingtip vortex elimination without the need for additional power.

FULL DESCRIPTION

This invention introduces a unique rotor mechanism designed to enhance lift and eliminate the destabilizing wingtip vortex in aircraft by utilizing the energy from free stream wind. The rotor's fins are specifically configured to rotate passively, harnessing the ambient airflow to counteract the wingtip vortex directly. Additionally, a wheel placed on the airfoil's upper surface further increases lift by capturing free stream energy, offering a significant improvement over traditional winglet designs.

SUGGESTED USES

- Aerospace industry for commercial and military aircraft design.
- Aerodynamic research and development for performance optimization.
- Airport operations for improved runway safety and efficiency.
- Unmanned Aerial Vehicles (UAVs) and drones in low Reynolds number applications.

ADVANTAGES

- Enhances lift more effectively than commercially available winglets.
- Passively powered, utilizing free-stream wind energy for operation.
- Eliminates wingtip vortices, reducing wake turbulence for following aircraft.
- Improves safety and efficiency on runways by reducing delays caused by lingering vortices.
- Potential for hybrid configurations with winglets for even greater lift forces.

PATENT STATUS

Patent Pending

RELATED MATERIALS

- Deb, D., et al. Taha, H. E. (2024). Enhancing lift and reducing wingtip vortices using a passive rotor on finite-span wings. Aerosp. Sci. Technol. 146.

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OTHER INFORMATION

CATEGORIZED AS

- **Transportation**
  - Aerospace
- **Engineering**
  - Other

RELATED CASES

2025-785-0

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