Wind Harvest Secures Patent for Breakthrough Design That Solves Fundamental Challenge in Vertical Axis Wind Turbines

Wind Harvest Has Secured A U.S. Patent for Breakthrough Blade Design That Solves a Fundamental Manufacturing Challenge in Vertical Axis Wind Turbines

DAVIS, CA, UNITED STATES, April 15, 2026 /EINPresswire.com/ -- Wind Harvest International Inc. announced today the granting of U.S. Patent No. 12,595,781 B1 for a Reinforced Blade for a Vertical Axis Wind Turbine, a design innovation that resolves a critical obstacle in the manufacture of large aluminum blades for vertical axis wind turbines (VAWTs).

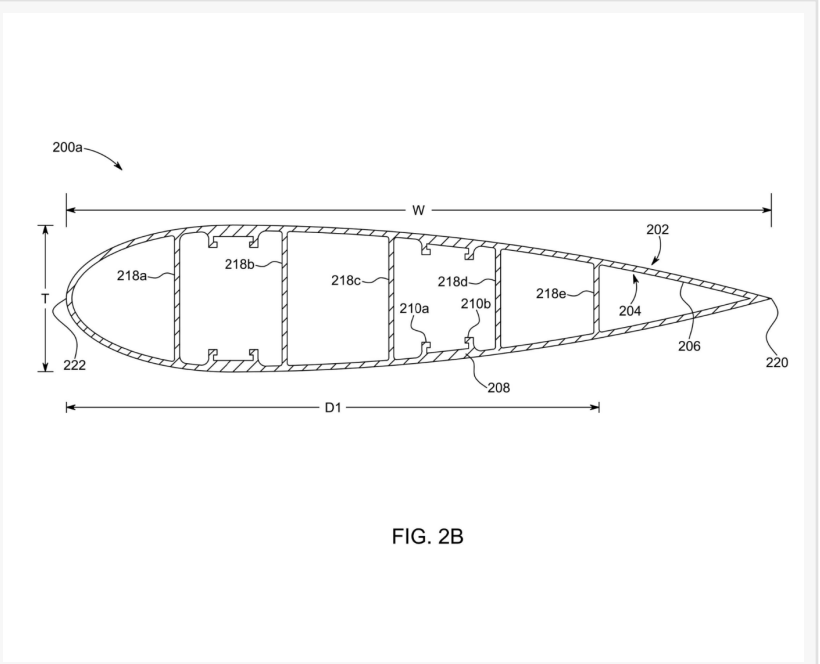


Diagram of Patented Wind Harvest VAWT Blade Design - Side View

The Problem: A Flaw Hiding in Plain Sight

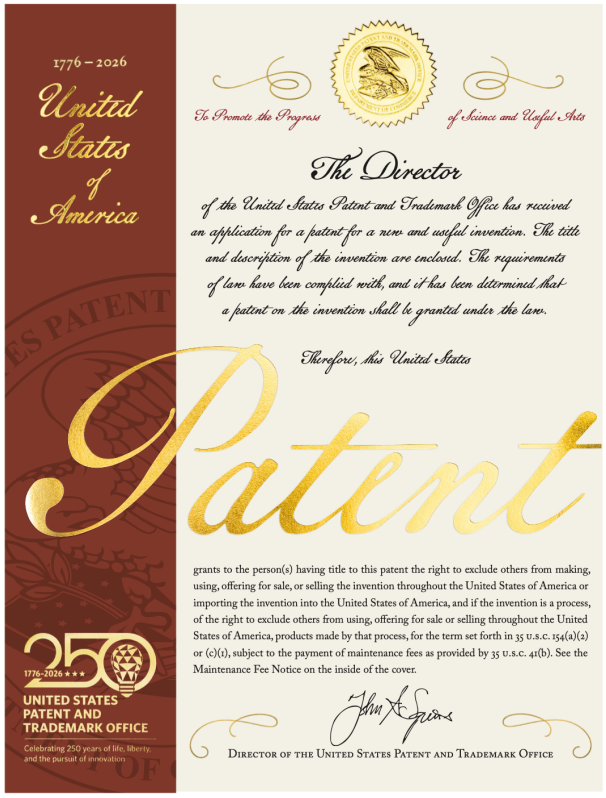
Wind Harvest's aluminum VAWT blades are manufactured through an extrusion process — a method in which molten aluminum is pushed through a shaped die to produce a hollow, airfoil-profiled structure. During cooling after extrusion, the thick and thin sections of the blade skin contract at different rates. Without adequate internal support near the trailing edge, this differential cooling causes the skin to curl or bend — a defect that compromises structural integrity, aerodynamic performance, and fatigue life.

This was not a theoretical concern. Step-G, a major extrusion company in Germany, encountered exactly this problem when producing blades for Wind Harvest. The trailing-edge deformed after extrusion.

The Solution: Placing an I-Beam Wall Where It Was Never Placed Before

Wind Harvest engineers analyzed the root cause and developed an elegant solution: positioning an additional internal I-beam wall — or repositioning an existing one — at a precisely defined location between 58% and 90% of the blade's chord length, measured from the leading edge. In testing, a placement at approximately 78% of chord length (roughly 470 mm in a 600 mm chord blade) proved optimal.

This strategically located beam wall stabilizes the trailing-edge cell during cooling, preventing the warping that would otherwise occur. It simultaneously improves stress distribution under aerodynamic loading, enhances fatigue resistance in the turbulent near-ground wind conditions that VAWTs are designed to harvest, and adds structural integrity to the finished blade — all without a significant increase in blade weight.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The Director
of the United States Patent and Trademark Office has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.
Therefore, this United States
Patent
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The patented design also incorporates a unified variable-thickness extruded skin and a bracketed structural member — featuring opposing L-shaped brackets that hold a nut bar — enabling secure, reinforcement-free blade-to-arm attachment. This eliminates the need for the custom-fitted metal reinforcement plates and epoxy applications that conventional VAWT assembly has long required, reducing both manufacturing cost and assembly complexity.

"Without the capital from our earlier crowdfunding efforts, we would never have been able to order the die and blades from Step-G and not have found out about the extrusion problem," said the company's principal engineer and lead inventor Dr. Ola Ajala. "Addressing a manufacturing challenge led to the invention disclosed in the patent which we believe will play an important role in enabling durable vertical□axis turbines for turbulent wind."

A Foundation for Global Wind Energy

Wind Harvest International intends to pursue patent protection for this innovation in all countries with wind farms situated in terrain with significant near-ground wind resources — the precise environments where vertical axis wind turbines offer a compelling advantage over conventional horizontal axis designs. Wind Harvester VAWTs operate efficiently in the turbulent, omnidirectional winds common at lower elevations and in complex terrain. This blade innovation may make it difficult for others to produce industrial scale VAWTs for turbulent conditions.

The patent, granted April 7, 2026, names inventors Olamide Ajala-Inyang, Antonio Monge, Alin-

Ionut Munteanu, David Malcolm, and Kevin Wolf, and is assigned to Wind Harvest International Inc.

About Wind Harvest International Inc.
Wind Harvest International Inc., headquartered in Davis, California, develops advanced vertical axis wind turbine systems engineered for performance in challenging, near-ground wind environments. The company's technology portfolio addresses the structural, aerodynamic, and manufacturing challenges unique to VAWT deployment at commercial scale.

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