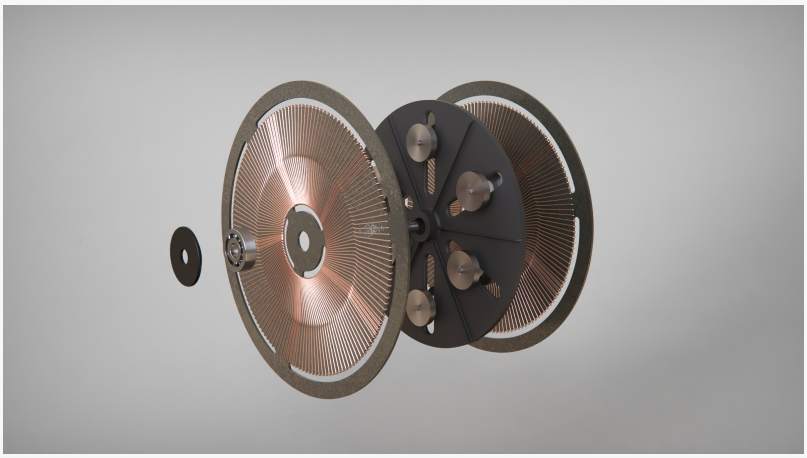
A Novel Generator to Enhance Low-Speed Renewable Energy Conversion

Less is More: The Simple, Innovative Rotor Design Powering Low-Speed Kinetic Energy Conversion



Coils and rotor with moving magnetic fields for greater velocity

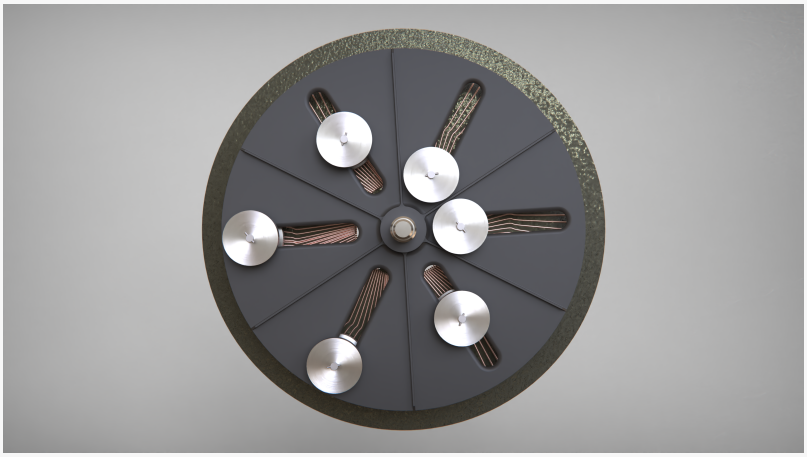
HONOLULU, HI, UNITED STATES, July 25, 2023 /EINPresswire.com/ -- Wavr LLC, proudly introduces the design of its Prime Movr generator. This innovative solution addresses the intricate challenges often experienced with small-scale electromechanical energy harvesters. By featuring a straightforward, bi-directional permanent magnet rotor, the Prime Movr generator negates the necessity for gears and accommodates a broad array of input speeds and variable input torque.

> We must exhaust all possible avenues in our quest for solutions that will steer us towards a sustainable energy future”
>
> *John Waihee*

Originally intended for use in their existing wave energy converters, Wavr now envisions the Prime Movr generator will empower various additional applications where low-speed mechanical energy is accessible for harvesting. These may include human gait, hand-crank mechanisms, and low-speed wind and water flows. One of the challenges faced by many small energy harvesters is that the drive shaft's speed is frequently too low to generate substantial current in the copper windings. While a gearbox can be implemented to augment the shaft speed to the alternator, this solution often escalates startup torque requirements to impracticable levels. Additionally, it introduces mechanical complexity typically unsuitable for low-power energy harvesting applications.

Leveraging the power of gravity, the Prime Movr incorporates a novel alternator design that introduces a radial degree of freedom for the moving magnetic field. It can more efficiently convert kinetic energy into electricity at low speeds without the mechanical complications or losses typically associated with a gearbox. The Prime Movr is designed with its rotational axis

oriented perpendicularly to the gravitational field. This setup facilitates the lifting of the magnet by the rotor's rotation, subsequently causing it to roll down its track. This motion, in turn, produces a dynamic magnetic field, characterized by a velocity typically greater than the rotor's rotational speed.



Magnets move as the rotor spins

The Prime Movr Generator with turbine blade attached

Contrasting with a traditional alternator, the Prime Movr's rapidly moving radial magnet stimulates a higher induction of current within the adjacent coil. This extra degree of freedom serves as the critical catalyst in harnessing the potential of mechanical power conversion at both low and variable speeds. Applications include wave motion and other low-velocity water and wind currents. Clyde Igarashi, the founder of Wavr LLC, commented, “In our quest to optimize wave energy converters, we tested numerous conventional rotary generators. However, we grappled with overcoming the friction resulting from gear usage, which was needed to achieve the requisite rotary speed. When we couldn’t overcome the limitations of the typical generator and gear set-up, we had to come up with a better solution.”

Alongside the development of its Prime Movr generator, Wavr LLC is also developing a Kinetic Energy Converter to demonstrate the potential of their low-friction technology. Both the generator and the kinetic energy converter can be seen on their official website: https://www.thewavr.com/

About Wavr

In 2016, Wavr's founder, Clyde Igarashi, in collaboration with the company's advisor, Dr. Victor Cheboxarov, successfully secured a patent for a concept of a large-scale Wave Energy Converter. This innovative concept enables the resonant conversion of mechanical energy into electricity. Despite facing many hurdles associated with such large-scale projects, Dr. Cheboxarov remains committed to this promising technology's continuous research and development, alongside his other projects at his university in Russia.

Mr. Igarashi's inspiration to establish Wavr LLC in 2022 stemmed from a pivotal meeting with former Hawaii Governor John Waihee, who presently serves as an advisor to the company. Governor Waihee advised the Wavr team to focus their expertise on developing compact, modular systems that could be rapidly deployed and scaled as needed. His recommendation was drawn from his firsthand experiences with large-scale energy projects, which frequently encountered complexities beyond technical aspects.

Since its inception, the Wavr team has grown and is firmly committed to the rapid development of practical and affordable renewable energy technologies. This dedication is born from their ambition to confront the urgent challenges posed by our changing climate, primarily by reducing dependence on fossil fuels for energy needs.

Hawaii is the first US state to enact legislation requiring 100% renewable energy generation by 2045, leading the country's clean energy transition. With current progress surpassing expectations, Hawaii is on track to achieve this ambitious target by utilizing an array of established wind and solar energy conversion technologies. Cutting-edge energy sources like wave energy conversion are also gaining ground. "It would be a great accomplishment if our technology could amplify the efficacy of other renewable energy technologies in Hawaii and around the world. We must exhaust all possible avenues in our quest for solutions that will steer us towards a sustainable energy future," stated Advisor Waihee.

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