

PATENT - TURBINE ENERGY DEVICE - FOR SALE OR LICENSE

My name is Doron Ezoory, I am the inventor and owner of a patent on an invention for more efficient energy generation. The patent is granted in 18 countries, and after years of working on its registration and development I am now offering it for sale or license.

Below is a brief review of the nature of my invention and the substantial benefits that it yields.

1. Introduction:

The patent employs relative counter rotational speed increasing transmissions (gears) adapted to create a counter rotation between a stator and a rotor of a generator, and to further increase their relative speed and/or the speed ratio beyond levels not previously possible. **For a given amount of transmissions - the patent achieves the highest speed ratio ever for a generator.**

This increases the efficiency, productivity and safety of energy generation.

2. General background:

Generators for producing electricity have existed for almost 200 years. Today, about 90% of the world's electricity is produced by these generators, which are powered by turbines rotated by forces such as: wind, water, burning of fossil fuels, etc. Increasing the efficiency and productivity of these generators is one important way of reducing carbon emissions into the atmosphere while meeting the continually increasing global demand for electricity.

3. Technical background:

One of the most influencing factors on producing electricity by a generator is the relative speed of rotation between its rotor element (for example: magnets/electromagnets) and its stator element (for example: copper coils). The stator (as its name suggests) is stationary in the existing conventional technology. Generally, increasing this relative speed increases the productivity of the generator, up to a certain limit. At least half of the generators in operation worldwide are using transmissions to increase this relative speed. When using the same number of transmissions and gear ratios in these transmissions - the patent exceeds the maximum speed ratio that can otherwise be achieved for a generator with a stationary stator.

Electric power is transferred through rotating elements by means being available in the market for years, such as swivel or slip rings that use liquid mercury or gallium with almost zero losses.

4. Advantages of the Patent:

There are several important advantages in several aspects, following are some of them:

A. Increases efficiency: The patent achieves the same or greater output power compared to existing conventional devices, while requiring fewer amounts of materials such as: transmissions and/or magnets/electromagnets and/or copper; some of which are heavy and very expensive. All this reduces weight, volume, and costs. Also, in some configurations, fewer transmissions are needed, which lowers mechanical transmission losses. **For Aircraft generators:** the patent can reduce weight and save hundreds of thousands of USD in fuel cost per airplane per year.

B. Increases productivity: The patent raises the output power compared to existing conventional devices that use an equivalent amount of materials such as: transmissions, magnets/electromagnets and copper. A scaled physical model I built as a 'proof of concept' shows over 20% increase in the output power, in comparison to the conventional technology.

C. Increases safety: The patent allows a low rotational speed of the turbine during operation. This reduces the risk of instability or damage to the device which may otherwise occur; for example, when a wind turbine rotates at high speed.

In addition, a low rotational speed of the turbine provides the following:

D. Decreases environmental damage of wind turbines by reducing noise and injury to birds.

E. Expands implementation of green energy turbines into locations where flow is slow but still strong. For example, turbines rotated by sea waves, tides, rivers, pumped-storage, etc.

5. Legal status of the patent:

- The patent is granted in 18 countries around the world, including the USA, Canada, Brazil, UK, several countries in Europe (including Denmark), Israel, India, Australia, and more.
- The patent is valid for 20 / 21 years commencing from February 12, 2014.
- The patent is not relying on other valid patents for the purpose of its operation.

6. Previous patents and publications in the field:

The patent has successfully surpassed all the dozens of preexisting patents and technology found by the searches of the PCT and patent offices examinations in the various countries. It has proven by mathematical calculations that for a given amount of transmissions - the patent achieves the highest speed ratio for a generator - in comparison to all these pre-existing patents and technology, including those that use a counter rotating stator and rotor. Some of these preexisting patents are owned by large companies; for example:

US 4291233 (WESTINGHOUSE) | EP 2629407 (BELL)
US 8536726 B2 (VESTAS WIND) | US 2011206517 (S4 ENERGY)

7. Possible applications:

The invention applies to all types of turbines, generators and transmission systems, powered by any type of energy force. Market for implementation of the patented invention is estimated to be in the order of billions of dollars. Applications and uses for the invention are many and varied. For example: wind turbines; hydroelectric turbines powered by tides, waves, rivers, dams, and pumped-storage; electricity power plant generators driven by oil, coal, nuclear energy, geothermal energy, etc.; flying vessels in which weight and volume considerations are crucial; charging batteries in cars while driving, and in bicycles, scooters, etc. while they travel downhill and/or during braking; green hydrogen and cryptocurrencies mining generated by renewable energy; carbon credits earning; toys for children for studying electricity; and so on.

8. Further information:

Next page contains 4 figures from the patent documents with a short technical explanation about them and with a simple mathematical calculation example proving the superiority of the patent in comparison to the conventional technology.

In addition, in the following link you can find the videos and pictures of the 'proof of concept' model, the official granted documents of the patent, and, further mathematical calculations comparing the patent to preexisting patents and technology:

www.ezoory.com

Patent No.: Europe: **EP 3123599 B1** | USA: **US 11053922 B2**

Further information is available on request.

Thank you,

Inventor and owner name: DORON EZOORY

E-mail contact:

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or, copy & paste this link: www.ezoory.com/cn.html

Below are 4 figures from the patent documents (in colors) with a short explanation under them:

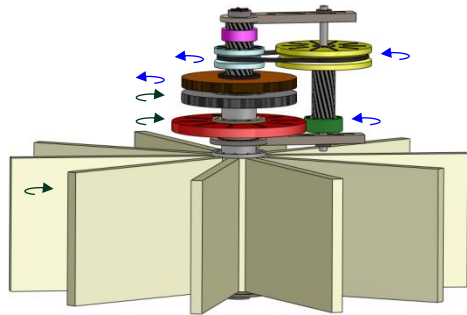


Figure 9 (3-Dimensions view)

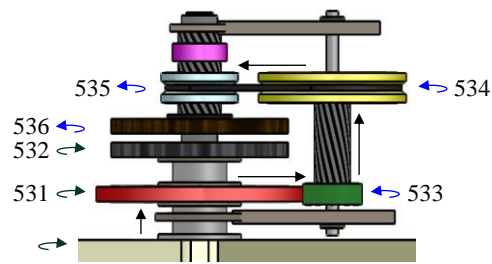


Figure 10 (Right view)

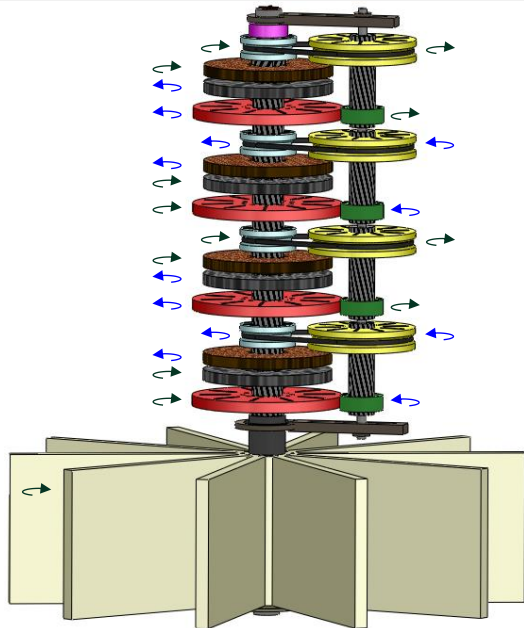


Figure 17 (3-Dimensions view)

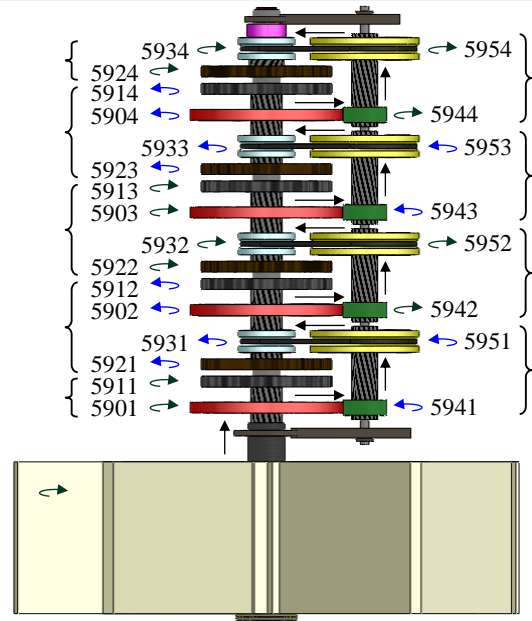


Figure 18 (Right view)

Figures 9, 10 illustrate a turbine, two transmission trains (input-output wheels: 531-533, 534-535 in each, one for opposite and one for direct rotation), and one stator and one rotor of one generator (532-536).

Figures 17, 18 illustrate a turbine, eight transmission trains, and one stator and one rotor in each of four generators. The relative speed of rotation between the counter-rotating stator and rotor in each generator becomes significantly greater from one generator to the next generator up along the illustration.

The straight arrows were added to indicate the direction of flow of rotational force coming from the turbine, and the rounded arrows were added to indicate the direction of rotation of each element.

General explanation of how it works: A turbine drives at least one opposite and at least one direct rotation transmission trains of any type - each can have any individual ratio of increasing speed between its input and output wheels - with respect to another, and at least one stator and at least one rotor of at least one generator. The input wheel of the first transmission train is rigidly fixed to and rotated by the turbine, and the input wheel of each additional transmission train is rigidly fixed to and rotated by the output wheel of its previous transmission train, such that each transmission train that is used multiplies and increases the total previous speed of the system. The transmission trains create counter rotation at high speed ratio between the stator and rotor of each generator - to generate power. Note: The arrangement of the transmissions types as well as the stator and rotor arrangements can vary, and the stator and rotor locations can be before, after, or in between the transmissions. The transmissions can be of any type, including planetary, crankshaft, or else. In figures 17, 18 at least one generator can be located on the external axle.

Mathematical calculation: comparing between the patent method to the conventional technology:

If the gear ratio in each of two transmission trains is 1:2, and the input rotational speed is "X", then, the maximum relative speed of rotation between the stator and rotor of the generator would be, in case of:

Patent method: 531 and 532 rotating at speed X, 533 and 534 rotating at speed 2X, 535 and 536 rotating opposite to 531 and 532 at speed 4X, such that the relative speed between 532 and 536 is: $X + 4X = 5X$.

Conventional technology: The stator or rotor is static, and the other is rotating at speed 4X (it is like 532 being static while 536 rotating at speed 4X), such that the relative speed between them is: $0 + 4X = 4X$.

Result: The patent method increases the relative speed in 25% compare to the conventional technology.