ONIPKO'S ROTOR

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The President of the Ukrainian Academy of Sciences, honored inventor, laureate of the State Prize of Ukraine in Science and Technology, PhD Alexey Onipko has been engaged into wind energy research for over 20 years. The idea of his wind rotor has been developed for about 15 years. The first patent for an experimental product was received in 2008. Since then, the design is being improved, various shapes and sizes of generators are being developed.

Onipko's rotor starts revolving at wind speed of 0.1 meters per second. On the contrary, ordinary windmills start revolving at a speed of 3 m/sec. Generally, the real value is around 4-6 m/sec., although, specifications often give a starting speed of 3 m/sec., which is actually the finishing speed at which propelling windmill stops). However, at the wind speeds over 15 m/sec., Onipko's rotor coefficient of efficiency comparing to usual windmills is the same. It should be mentioned that in most regions of Ukraine the average speed ranges within 2-6 m/sec.

In order to maximize the strength of the wind flow in any particular place, the anemometer that records data over time is set. These parameters determine the location and power windmill that are optimum for this area.

Onipko's rotor specificity lies in the idea that it is not always better to install it at a higher position. There were cases when the wind rotor, installed above the ground, produced more energy than raised to a height of15 meters. It happens that in the calm weather air masses on earth are moved due to the difference of pressure and temperature.

Another feature of Onipko's rotor is that it is more efficient at wind speed drops. That is, if, for example, its speed was 1 m / sec. for some time, and then changed to 7 m / sec., it is 400 times more effective than the during same period when the wind blew at the same constant speed of 4 m / sec . Additionally, for Onipko's rotor special power generator that converts electrical current into the smallest speed of moving components was developed.

In the laboratory of Ukrainian Academy of Sciences models of Onipko's rotor are developed in different sizes. A lot of thorough research to determine the optimal shape for different diameters of the rotor was conducted. The point is that simple copying of the model (increase-decrease in size) does not automatically retain the optimal efficiency of the device. This is demonstrated in wind tunnel experiments. According to their results, most optimal shape design for different diameters of the rotor was determined.

Onipko's construction department produces rotors for different occasions. For example, a small rotor of the size of a household fan can be installed on the balcony, producing up to 200 watts of energy. This is enough to feed two old 100-Watts bulbs, or several energy saving bulbs; a modern computer and a TV. 3-meters rotor is able to provide up to 3 kilowatts in high winds (the best option is to install it above the trees

and the roofs of neighboring houses). It produces about 300 kilowatt-hours of electricity on average during a month. Think the average amount of electricity a consumer consumes per month! One wind turbine is enough to fully feed all household appliances, except heating. Two or three such rotors could even provide heating for homes in winter. This rotor can be made of different materials. The first samples were made of aluminum sheets. 3-kW rotor (the mechanism without mast and generator) weighed about 40 pounds. Currently, there are various materials for producing Onipko's rotor i.e. plastic, acrylic and others. Based on Alexey Onipko's findings and drawings, rotors are made of acrylic by the company, which specializes in producing sanitary ware. Acrylic rotor weighs about 18 kilos, has a pleasant aesthetic appearance and can be painted in different to satisfy customers' needs. The price of production has not been set so far. However, it should be said that the price could range within several thousand hryvnas. The use of the rotor in autonomous heating for average household purposes requires an inverter and a battery. Batteries that are adapted to store energy from the Onipko's rotors are produced in Ukraine. They are made from dry blends and can be installed in the house. Undoubtedly, the cost of such construction that provides independent power supply needs further discussion. However, it is clear that it is a matter of thousands (not tens or hundreds) hryvnas each.

The weak interest of our government and entrepreneurs in serial implementation of the invention is really surprising. Although the Onipko's rotor has already been recognized in Europe and Asia. In the global competition of renewable energy, which took place in 2013 in Nurnberg, Onipko's rotor was recognized as the best in the developing world, he won the Grand Prix "Green Oscar". Chinese delegation has recently visited Ukrainian Academy of Sciences to offer the rotor's production within their country. The current situation in Ukraine, namely energy dependence (mainly on Russian gas) requires an immediate implementation of such inventions and should be of prior interest of state chairmen and businesses.

The introduction of mass production of this invention will make every house energy-independent and, thus the whole Ukraine. Onipko's rotor has already become famous not only in the field of wind energy, but also in ship model building. The experiment was conducted with different kinds of rotors as well as with Onipko's one. Currently, the researchers are actively using these rotors for designing new ship models.

REFERENCES

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