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"MAG-LEV WIND POWER GENERATING SYSTEM".

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ABSTRACT:

This paper describes the implementation of vertical axis wind turbine (VAWT) vertical axis wind turbines with solar panels for the generation of electricity from renewable energy sources which are wind energy and solar energy respectively. The VAWT works on the principle of electromagnetism and has a permanent magnet suspension system instead of the ball bearings used in conventional wind turbines. The electricity generated by this hybrid system is then used for public lighting.

Keywords: Wind energy, Magnetic Levitation, VAWT, Savonius Turbine.

I. Introduction

This system is based on the implementation of an alternative configuration of a wind turbine for the purpose of producing electricity. A vertical axis wind turbine (VAWT) is introduced by magnetic levitation technology to optimize performance. The system uses the nature of the permanent magnet as a substitute for ball bearings to levitate the turbine component and minimize the loss of energy during rotation, which is the main problem faced by the conventional wind turbine. The Maglev wind turbine must take wind energy technology to the next level. In addition, the system can be adapted for use in rural and urban areas in regions with low wind speeds. In our project, we combine these two sources to create a hybrid energy generation system. The results obtained will be compared with the conventional wind turbine model.

To compare, we used a conventional wind turbine. The main factor in human survival is energy. Everything that happens in the world is an expression of a flow of energy from one form to another. Electricity is not available in many rural areas due to the high cost of generation and distribution to small and scattered users. For the production of electricity, we have to depend mainly on hydroelectric and nuclear power plants. But due to some disadvantages such as surface compensation, high initial cost, availability of resources and even pollution, there is a need to rethink other renewable energy sources. Solar energy and wind energy are available in abundance all over the world and for free.

These energies have been exploited by humans for a long time and with advanced technology, we can harness them to generate electricity. The potential of solar energy is 178 billion MW, about 20,000 times the global demand, and the potential of wind energy is 1.6 × 10. MW, the current energy consumption rate on Earth. Solar energy can be converted into electricity by photovoltaic cells. The kinetic energy of the wind can be converted into electricity by a wind turbine. Since conventional wind turbines have several disadvantages, vertical axis wind turbines (VAWT) are the alternative solution. The advantages of the vertical axis wind turbine are: low initial and operating cost, ease of installation, small footprint, ability to capture wind from any direction and elimination of ball bearings through the use of the magnetic levitation technique. The advantage of these two sources of renewable energy can be exploited by creating a hybrid system, so we do not need to depend on the availability of a single source. The electricity needed for domestic use can be generated by a wind system.

II. Literature Review

These days, we will have to look to renewable or almost inexhaustible energy for human development to continue. Renewable energy is generally electricity produced from sources such as wind energy, solar energy, geothermal energy, hydroelectric energy, and various forms of biomass. These resources are called renewable because of their continuous renewal and availability for users from time to time. The solar energy when the sun hits the atmosphere is 10 17 watts, while the solar energy at the surface of the Earth is 10 16 watts. The total global demand for energy for all the needs of civilization is 10 13 watts. Therefore, the sun gives us 1000 times more energy than we need. if we can use 5% of that energy, which will be 50 times the amount of energy the world

needs. Electricity can be produced from solar energy by photovoltaic solar cells. When photons from the sun are absorbed in a semiconductor, they create free electrons with higher energies than electrons.

electrons to flow out of the semi-conductor to do useful work. The electric field in most solar cells is
provided by a junction of materials which have different electrical properties. The photovoltaic effect can be easily described easily for p-n junction in semi-conductor materials of solar cells which are silicon, cadmium, sulphide/copper sulphide, gallium arsenide.

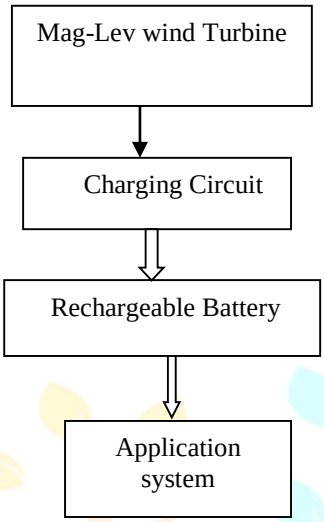

Figure 1. System flow

III. Research Analysis

When the wind blows, the turbine blades start moving, which drive a generator that produces electricity. The concept of operation of vertical axis wind turbines is similar to that of horizontal wind turbines. The main difference is in the orientation of the rotors and the generator, all positioned vertically and usually on a shaft for support and stability. This also results in a different response of the turbine blades to the wind compared to that of the turbine blades. horizontal configurations.

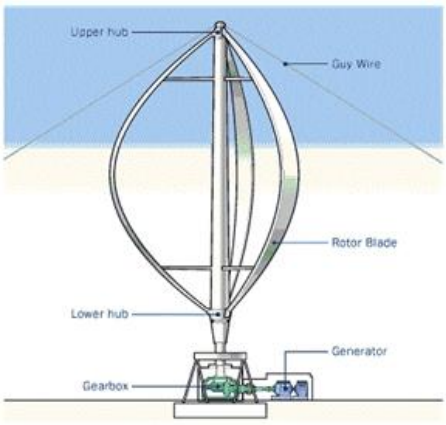

Figure2. Maglev Model

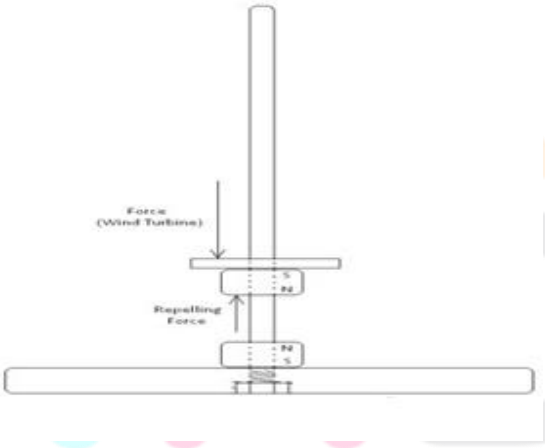

Figure 3. Magnet Arrangement

The magnetic levitation weight reduction structure for a vertical wind turbine generator includes a frame, a fixed permanent magnet, a shaft, a rotating permanent magnet, a blade distributor and a generator. The fixed permanent magnet attached to the frame has a repulsive first surface. The shaft is connected to the frame. The rotating permanent magnet attached to the shaft has a second repulsive surface compared to the first repulsive surface of the fixed permanent magnet. Two repellent surfaces they repel others. The blade part and the generator are connected to the shaft. When the rotating permanent magnet rotates, the shaft acts as a center of balance. An external structure supports the stator and the rotor is located in the head of the turbine. The main components of the system are the maglev zone, the hub of the blade and the generator. It converts the kinetic energy of the wind into electricity. A modified ceiling fan is used as a wind turbine. The main function of the rotary ceiling fan is to provide fresh air in the attic and residential areas all year round, 24 hours a day, free of charge. The new idea of magnetic levitation helps to improve wind turbine speed and electricity production. This modification has the benefits of better air ventilation, but also provides additional power for charging devices.

IV. Implementation

In wind turbines, in addition to the diffuser shape of the hood, the rear part has a lip. This edge disrupts the flow of the wind, creating eddies that cause a low-pressure area to form behind the wind turbine blade. The wind then flows into the low-pressure area through the wind turbine blade blades. The increased airflow through the blades leads to another reason for higher power. [The shape of the diffuser and the combined edge create a more efficient and precise airflow. This results in the higher amount of energy produced. A charging circuit is used to charge the battery. This is a microcontroller-based charging circuit with LCD display. The display will show the charging status. Battery (electricity), a group of electrochemical cells for the storage of electrical energy, individually connected or individually connected and located in a single unit. An electric battery is a combination of one or more electrochemical cells, used to convert stored chemical energy into electricity Batteries can be used once and thrown away, or recharged for years as in emergency power applications. Miniature cells are used to power devices such as hearing aids and watches; larger batteries provide backup power for telephone exchanges or computer data centers.

V. Conclusion

The proposal of a vertical axis wind turbine based on Mag-lav and the concept of wind lens are very useful for us. Non-conventional energy systems are essential for our country today. Overall, the magnetic levitation vertical axis wind turbine has been a success. The designed rotors capture enough air to spin the stator in low and high wind speeds, keeping the center of mass closer to the base, which provides stability. The rotors and stator of the wind turbine have been properly mounted with permanent magnets, which allow for smooth rotation with negligible friction. The magnetically levitated vertical axis wind turbine (VAWT) performed better than the conventional wind turbine.

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