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Non Conventional Method of Water Pumping Using Vertical Wind Turbine

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Abstract

The major problem for the agriculturists at the present scenario is the energy crisis. The major source of water for the fields is wells and bore wells. People use pumps to pump out water from wells and bore wells. This process involves lot of energy consumption every day. Our project deals with the process of pumping out water from wells and bore wells using a specially designed wind mill. Our setup does not require any electrical devices and thus thereby the losses are avoided.

Keywords: Variable Pumping, Well, Savonius and Gorlov type of windmills.

1. Introduction

Our setup mainly deals with the coupling of Savonius and Gorlov type of windmills. This coupling makes sure that the individual disadvantages of both the models are rectified and are converted to positive one.

2. Savonius Model

Savonius wind turbines are a type of vertical-axis wind turbine (VAWT), used for converting the force of the wind into torque on a rotating shaft. The turbine consists of a number of aerofoils usually--but not always--vertically mounted on a rotating shaft or framework, either ground stationed or tethered in airborne systems.

3. Gorlov Model

Vertical-axis wind turbines (VAWTs) are a type of wind turbine where the main rotor shaft is set vertically and the main components are located at the base of the turbine. Among the advantages of this arrangement are that generators and gearboxes can be

placed close to the ground, which makes these components easier to service and repair, and that VAWTs do not need to be pointed into the wind.

4. Our Design

Our project deals with the coupling of both the models so that the individual disadvantages are converted into combined advantages. The picture representing the design of our project is given below, Fig.1 and Fig.2.

Fig. 1: A small Proto type of the Blades using the.

Fig. 2: Proto type of the Windmill.

Application

We have applied our new design of wind mill to pump water from bore wells and wells. For this we have used an additional Gear box and an external Gear pump.

- Gear Box : We have used a Bevel gear arrangement with an ratio of 1:5
- Gear Pump : We have used an external Gear pump with a maximum pressure discharge of .01 lit/sec.

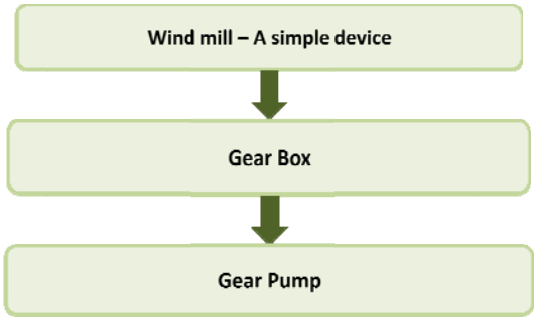

Fig. 3: Arrangement of Windmill.

Thus as the flow chart Fig.3, implies the wind mill arrangement is directly couples to that of a Gear box and the power is directly transferred to that of an external gear pump which is a positive displacement pump that is capable of creating a pressure difference even at slower speed. The pictures of our project is as follows, Fig.4 and Fig. 4.

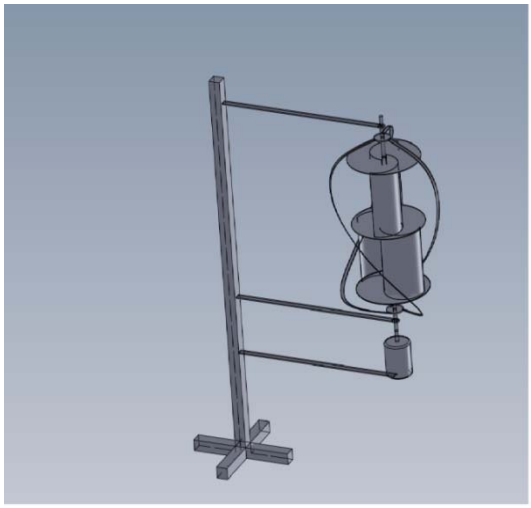

Fig. 4: Designed Model of the Windmill

Fig. 5: Working Model of the Windmill

5. Advantages

- Most required device at the rural places where the is no electric power.
- Conserves thousands of watts of power every day
- Less maintenance is sufficient
- Operates at lesser noise when compared to other pumps
- Favorable device for most of the agriculturists.

6. Conclusion

Our work is to show that vertical axis wind energy conversion systems are practical and potentially very contributive. Thus we have used our new design of wind mill to pump out water from the bore wells and wells. This will help at a major rate to conserve tons of watts of power every day.

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