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ELECTRICITY GENERATION BY USING ROOFTOP VENTILATOR

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Abstract:- *Day by day electricity requirement is increasing with increase in population. Electricity can be generated from different source of energy it could either renewable or non-renewable. One of the methods for the electricity generation is with the use of Roof top ventilator. Roof top ventilator works on the principle of natural convection. The ventilator sucks the warm air in the building and throws it to the outside of the building, then the inside building temperature and humidity are not too high. We can convert this warm air into electrical energy using rooftop ventilator. By using this technique we can glow at least 5 watt bulb.*

Key Words: **Rooftop ventilator, DC generator, Charge controller, DC battery, LED lamp.**

1. INTRODUCTION

The electricity can be generated by using two sources which can be renewable and non-renewable sources. Non-renewable sources are those sources which uses fossil fuels to generate the electricity such as oil, coal, natural gases. These resources cause the pollution to the environment.

Renewable energy includes solar energy, geothermal energy, and tidal energy. These resources have many advantages such as it requires less maintenance also they do not cause pollution to the environment therefore government has to develop small power station for generation of electricity. One of the methods for generation of electricity is by roof top ventilator. The main function of the roof top ventilator is to provide the ventilation. There are two types of roof top ventilator which is motor driven and natural air driven. So this paper is about the second type which is natural air driven. The main component of RTV system are DC motor, battery, inverter etc. which convert the kinetic energy from the warm air to the electricity for our usage. The new idea to improve the ventilator speed an electrical production is to add the additional fins. This free electricity has to use to charge the battery. By using this electricity we can drive the small appliances such as light or as per requirement. To drive this application we have to use the inverter to convert DC supply into AC supply. Roof ventilator does not require external power connection and does not consume any power units. The roof ventilator works on the principle of flywheel and once the flywheel gets momentum it keeps on rotating.

1.1 Rooftop Ventilator

The fig.1 shown below of rooftop ventilator. The free spinning roof ventilator has the function to provide fresh air in living area and roof space all 24 hours a day free of charge. The size of the rooftop ventilator in the market is 22 inch with diameter size .This size has 30 curves blade to capture the wind kinetic energy. Zinc is used to produce this rooftop ventilator because it cannot be affected by rust the mechanical aspects of this product are just the simple with the proper installation of the component. It is generally mounted on the roof of the house to suck the warm air of the house. The rotation of rooftop ventilator is totally depending upon the wind. The faster the wind, faster the turbine will rotate and exhaust the heat, smoke, fumes, humidity, etc.

Fig.1 Rooftop Ventilator

1.2 DC Generator

The DC generator is an electrical machine which converts mechanical energy into electrical energy which is direct current energy. This free electricity has to use to charge the battery because the roof ventilator is not working all the time. This to ensure that there will be no back-flow current if the rooftop is not functioning. DC generator doesn't make constant current and this current still where is between maximum and zero so that the power produce will be jerky. The output voltage of DC generator is 5 Volt.

Fig.2 DC Generator

1.3 Charge Controller

The charge controller is also known as battery regulator. It limits the electric current which is drawn from electric batteries. The charge controller prevents against the overcharging and provides protection against overvoltage. It may also prevent completely draining a battery to protect a battery life. The charge controller which we have used operates up to 6 amp and operating temperature is $0\text{-}40^0$ C. The purpose to use the charge controller in rooftop ventilator because the rooftop ventilator is not working all the time.

Fig.3 CHARGE CONTROLLER

1.4 DC Battery

Generally the battery is used to store the electricity. When the electricity generates by the DC generator this free electricity is then stored in battery. The voltage rating of dc battery is 12 v and current rating is 7.2 amp.

Fig.4 DC Battery

2. BLOCK DIAGRAM

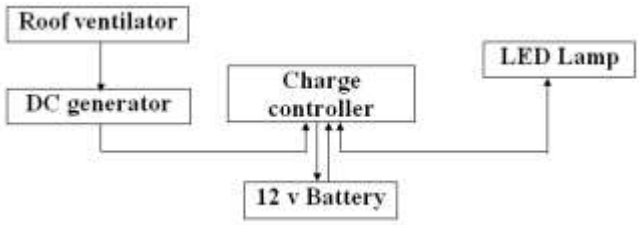

Fig. Block diagram of rooftop ventilator

3. WORKING

Roof top turbines work on a simple principle: instead of using electricity to make wind—like a fan—wind turbines use wind to make electricity. Wind turns the propeller-like blades of a turbine around a rotor, which spins a generator which create the electricity. Wind is a form of solar energy caused by a combination of three concurrent events:

1. The sun unevenly heating the atmosphere
2. Irregularities of the earth's surface
3. The rotation of the earth.

The terms "wind energy" and "wind power" both describe the process by which the wind is used to generate mechanical power or electricity.

This mechanical power can be used for specific tasks (such as grinding grain or pumping water) or

a generator can convert this mechanical power into electricity. A wind turbine turns wind energy into electricity using the aerodynamic force from the rotor blades, which work like an airplane wing or helicopter rotor blade. When wind flows across the blade, the air pressure on one side of the blade decreases. The difference in air pressure across the two sides of the blade creates both lift and drag. The force of the lift is stronger than the drag and this causes the rotor to spin.

The rotor connects to the generator, either directly (if it's a direct drive turbine) or through a shaft and a series of gears (a gearbox) that speed up the rotation and allow for a physically smaller generator. This translation of aerodynamic force to rotation of a generator creates electricity.

4. CONCLUSION

In this paper we use wind energy for production of electricity in case if we required more demand in production of electricity so we can use two types of drives mechanism which is belt drive or gear drive.

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