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An Electricity Generated Through Roof Ventilator

RahulkumarGondliya[1], Kishan Goyani[2], Hiren Hirapara[3], ManishSolanki[4], Hitesh S.Patel[5]

[1]*Electrical department& Gujarat technological university, hitesh.me91@gmail.com*

Abstract—***This paper develops the roof ventilator by adding single phase synchronous generator for voltage generating. The construction contains low flux density permanent magnet in rotational part and the winding stator install at the ventilator base. When the ventilator rotates, the flux of the permanent magnet rotor part is moving across the air gap and induced the ac. voltage in the single-phase stator winding. After that, the AC. voltage is rectified to DC. voltage and finally charged to the 12V,2A lead-acid battery.***

Keywords— Roof ventilator, Generation, Inverter

I. INTRODUCTION

This paper is explained about roof ventilator generator. The mainconcept of natural ventilation without using electric energy is lead to be the roof ventilator. Thistechnology is popular using by install on the roof in warehouse, workshop, industrial building andincluding to residence. Stationary part is composed of base and fixed shaft. Rotational part is composed of fan blades and bush that put on the fixed shaft on stationary part. For the principle of roof ventilator, when the air flow on the top of roof or the heat air that lifting to under the roof, it turns the roof ventilator. Ventilation rate is up to the speed and the size of roof ventilator. The generated voltage is rectified to dc and charge 12-volt DC battery. Voltage controller circuit is used to maintained constant voltage.

II. BLOCK DIAGRAM

In this block diagram the AC voltage is converted in to DC with help of diode rectifier and battery is charged through this DC voltage.

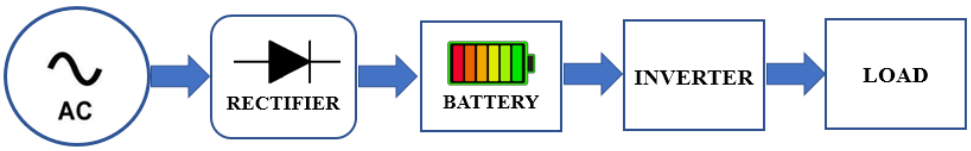

Figure 1 Block Diagram

The load is connected though inverter circuit. In this model we can generate 15-25 volt with 100-200 rpm speed of roof ventilator.

III. ROOF TOP VENTILATOR

Wind turbo ventilator is a wind driven ventilator that is installed on the roof of building to provideeffective ventilation. It is use in all types of industries, workshops, warehouse. The air ventilationworks on the simple principle of wind assisted rotation and stack effect. The main function of thefree spinning is to provide fresh air in roof space and living area. Air are free around 24 hours of aday on all year. The additional function of this product is to produce the electrical energy from theroof ventilator that will spin the wind is exist. [1][5]

Figure 2 Roof ventilator

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IV. CONSTRUCTION OF GENERATOR

In this model the rotating kinetic energy of roof ventilator, which is not utilised. This paper shows the winding is placed in fix part and permanent magnet is fix on moving part. Therefore, rotating energy converted in to electrical energy. The ventilator speed is not constant, so generated voltage stored in battery. So, battery get constant charged and with the help of inverter it can be utilised in load. Figure show the construction of generator. [2][3]

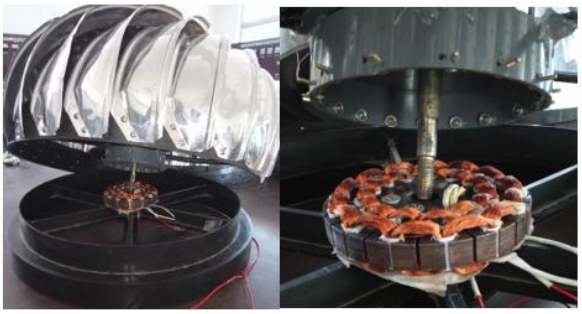

Figure 3 Roof ventilator with generator

This is a single phase permanent magnet type generator has 28 slots.

V. VOLTAGE GENERATION METHOD

The main function of the free spinning roof ventilator is to provide fresh air in roofspace and living area all year round 24 hours a day free of charge. The additional function of thisproduct is to produce the electrical energy from the roof ventilator that will spin when the wind exists.The progress and tests of the system have been fully demonstrated. The consumers not just can enjoythe benefits of the better air ventilation in the house, but also have extra electricity supply for loadappliances such as radio, mobile phone charger and aquarium oxygen pump. To design the airventilation turbine to generate the electric current, the concept was designed to modify the ventilatedturbine with the diameter 24 inches to install the AC generator. [4]

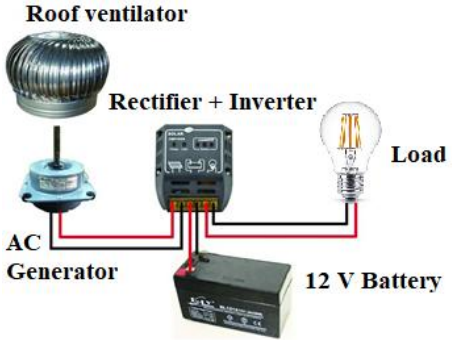

Figure 4 Generation method

The out of AC is rectifyingto charge the battery and by using 12 volts to 230-volt AC inverter, it will connect to the load.

VI. OVERALL MODEL

This figure shows the overall model of the roof ventilator generator.

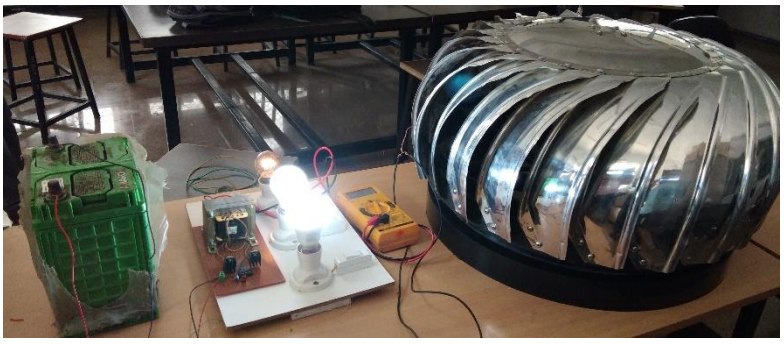

Figure 5 Overall Model

This is a square wave inverter model. The output of inverter in this model is 60 VA, so it can be connected load up to 50watt. Depending up on load requirement the size of inverter may change.

VII. RESULTS ANALYSIS

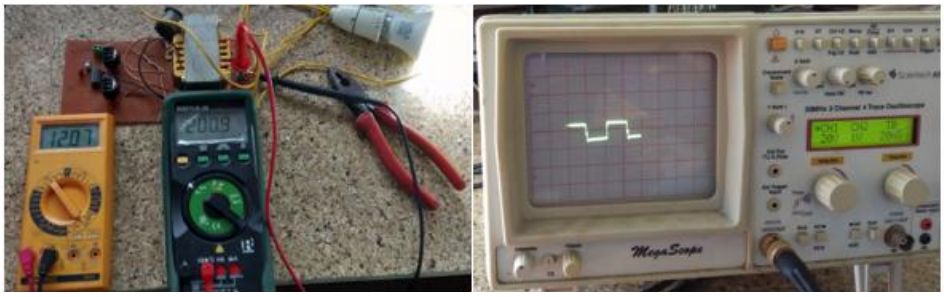

Figure 6 Output voltage and waveforms

Figure show the output of the inverter. Inverter is 12 volt and output is 230 volts at no-load and 200 at loading condition. Second figure show the inverter output wave form in CRO measurement.

Sr	Speed of Generator	Output Voltage
1	2000	30
2	1500	25
3	900	21
4	600	15
5	400	10
6	300	8

This model generate output up to 4-6 watts, so we can synchronize number of unit for higher output.

VIII. APPLICATION

Induced voltage from generator is directly proportional to the speed of roof ventilator. In case ofpractical installation on the roof, voltage is induced lower than the measurement in laboratory because ofwind changing.This type of model is very useful in industry, workshop, auditoriums etc., where roof ventilator is found in large hall. By using number of roof ventilator unit, we can generate maximum power output, which can be useful to hall lighting.

VI.CONCLUSIONS

The main objective of the model is to convert the kinetic energy of roof ventilator to electrical energy. This can be saving electricity, which generated by convectional sources. By modify this single-phase AC generator in to three phase AC synchronous, overall output will be increased.

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