VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELGAUM.

A PROJECT REPORT

On

"Power Generation by Rooftop Ventilator Turbine using Coreless AFPM Generator" (Sponsored by KSCST, Bangalore)

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In

ELECTRICAL & ELECTRONICS ENGINEERING

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CHAPTER 1.

Introduction

1.1 Background

In viewing the energy crisis and the fast degradation of the natural environment, scientists have become increasingly interested in the renewable energy. Kinetics in nature, for example winds, water, ocean waves, can play a significant role in tomorrow's electricity production, but the constructions require adaptations to their media. However, there are some problems in the development of the clean energy power generator, such as high cost of construction, difficult maintenance, the power distribution and need to install in specific place etc. Therefore many countries now gradually begin to develop a small power station to improve such flaws.

There is high humidity and warm weather in summer. Long exposure to the sunlight and high room temperature make ventilation a necessity in the factory building. Therefore, the concept of natural ventilation without using electric energy has led to roof ventilators. When the air flow on the top of the roof or the heat air that lifting to under the roof, it turns the roof ventilator. The ventilator sucks the heat air in the building and throws it to the outside of the building, then the inside building temperature and humidity are not too high. This technology is popularly installed on the roofs in warehouses, workshops, industrial buildings and even residences.

There are two rotating principles of the ventilator. The first principle is the hydromechanics that the air current can flow from the high temperature area to the low temperature area to motivate blades to rotate. This air convector can both exhaust and ventilate spontaneously, when the indoor and outdoor temperature is different. The air can flow through the gap of the turbine blades from high temperature side to low temperature side; therefore a spontaneous ventilating phenomenon is formed. In addition, when the turbine wheel revolves, the high temperature air will be discharged from the room, so the air density in the room can be reduced, then the cold air outdoor therefore enters the room to achieve the convection goal. Continuing this may achieve the effect of ventilation and refrigeration at the same time. The second principle is the air convector. It relies on the breeze air to rotate its blades. Its structure is similar to that of a backward-curved fan. The curving direction of the blades is opposite to the direction of the