

ELECTRICITY GENERATION AND VENTILATION USING EXHAUST FAN

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ABSTRACT

The energy demand of the world has become unbridled in the past years and is augmenting by leaps and bounds. With increase in energy demand, the conventional sources of energy (fossil fuels, nuclear) are encumbered with monumental pressure and hence, the unremitting use of it, leads to dearth of fossil fuels. This has provoked an extensive research into the area of non-conventional energy sources like hydro, wind, thermal energy, etc. Out of these, the wind energy is being discussed in this paper. Wind energy has a lot of potential and advantages but its utilization is restricted due to its irregularity, geographical conditions and its availability. Our primary goal is to suggest an idea that can surmount these conundrums and utilize the wind energy to its maximum extent. This paper deals with the wind energy that can be derived from the wasted wind energy from industrial exhaust fans. The wind force from an exhaust fan can drive a small wind mill and the energy generated from it will be stored in energy storage unit. The power stored in the battery can be transmuted into ac with the help of an inverter and then it can be supplied to the load and hence, this wasted power from exhaust fan can be utilized to meet the growing energy demand. Also this wasted air is used to provide ventilation in room using arduino microcontroller & humidity sensor.

Keyword – Exhaust Fan , Vertical wind mill turbine , Peltier Module , DC Generator , Battery.

1.INTRODUCTION

The rapid depletion of natural resources and fossil fuels has led to the development of alternative sources of energy. The conventional sources of energy are non-renewable, cause pollution, not sufficient to meet the growing energy demand. Due to these reasons, it is imperative that we must start exploring and developing methods to utilize the nonconventional energy sources to reduce too much of dependence on conventional sources. One of the most arresting forms of non-conventional energy is wind energy. But due to some of its limitations, the wind energy cannot be utilized fully to produce electricity. This limitation can be surmounted with idea of using the wind from exhaust fan of big industries as a source of power. The energy demand of the world has become unbridled in the past years and is augmenting by leaps and bounds. With increase in energy demand, the conventional sources of energy (fossil fuels, nuclear) are encumbered with monumental pressure and hence, the unremitting use of it, leads to dearth of fossil fuels. This has provoked an extensive research into the area of non-conventional energy sources like hydro, wind, thermal energy, etc. Out of these, the wind energy is being discussed in this paper. Wind energy has a lot of potential and advantages but its utilization is restricted due to its irregularity, geographical conditions and its availability. Our primary goal is to suggest an idea that can surmount these conundrums and utilize the wind energy to its maximum extent. To deals with the wind energy that can be derived from the wasted wind energy from industrial exhaust fans. The wind force from an exhaust fan can drive a small wind mill and the energy generated from it will be stored in energy storage unit. The power stored in the battery can be transmuted into ac with the help of an inverter and then it can be supplied to the load and hence, this wasted power from exhaust fan can be utilized to meet the growing energy demand. Also the wasted air from exhaust fan used to provide ventilation to room.

1.1 OBJECTIVES

- To produce electrical power from the wasted wind force of the exhaust fan .
- To provide the ventilation to room along with the power generation from exhaust fan.

1.2 WIND POWER

The metamorphosis of energy of wind into a usable form of energy is the wind power (e.g. generating electrical power using wind turbines)

Merits of wind energy:

- It is renewable source of energy.
- It emits no greenhouse gases and hence non polluting.
- It uses very little land or space.
- Fuel transportations are not required in wind energy conversion system.

Demerits of wind energy:

- Availability of energy is fluctuating in nature.
- Low energy density.

2.DESIGN & IMPLEMENTATION

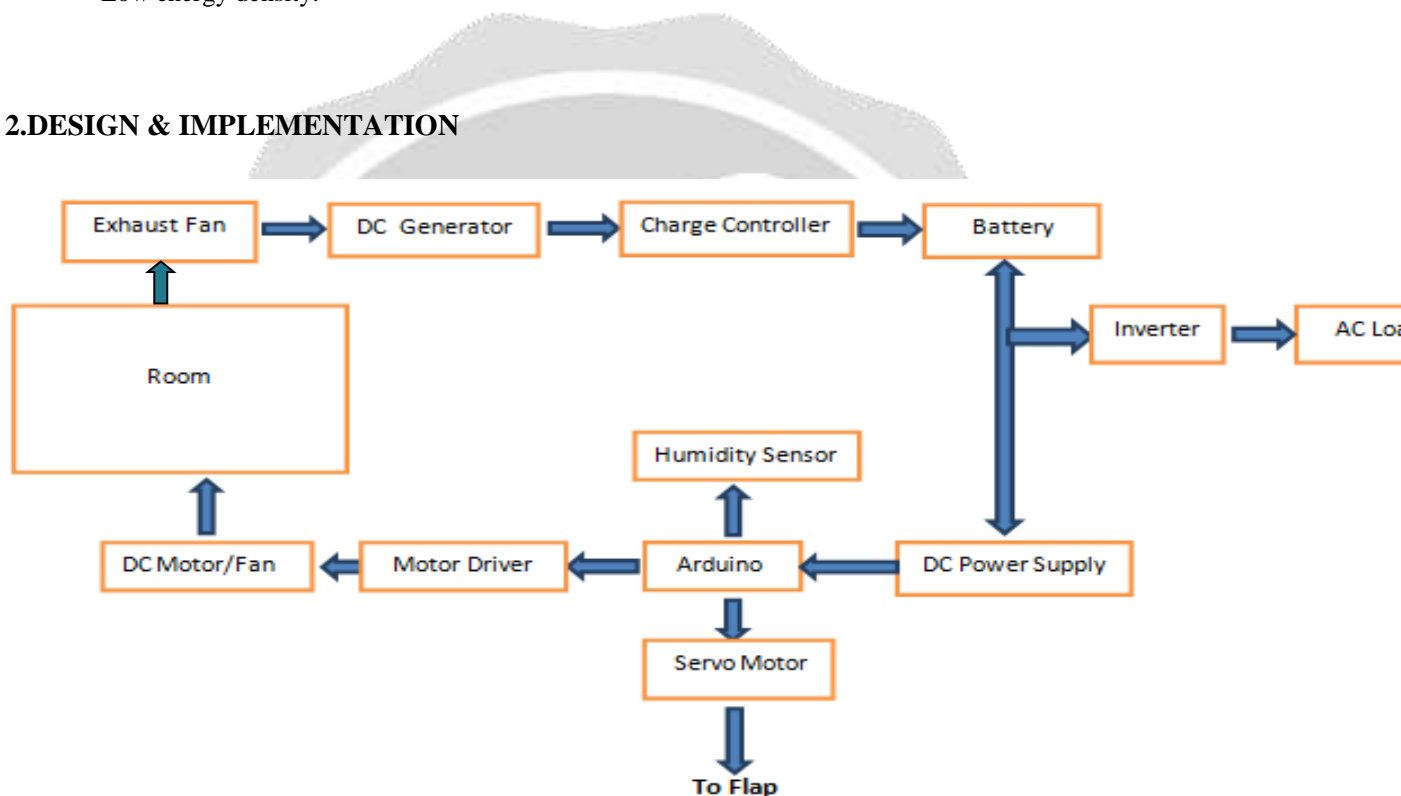


Fig- 1. Block diagram of generation of electricity & ventilation using exhaust fan

2.1 WORKING PRINCIPLE

The rotary motion of exhaust fan is converted to electrical energy by using a DC generator which can be stored in battery. The hot air present inside the room or space exit with the rotation of vanes of the exhaust fan. Due to which the air density inside the room or space becomes less. This allows the cold air to occupy the emptied space. This is the simple principle of working of Exhaust Fan.

The hot air exhaust from Exhaust Fan can be introduced over wind turbine which is further coupled with DC generator to generate electricity which can be stored in battery.

2.2 APPLICATION

- Used In Process Industry.
- To operate low voltage AC load Tubelights, fan, laptops, etc.
- In automobile vehicles to charge mobile phones.

3. CONCLUSION

Wasted wind force of exhaust fan can be utilized to produce electrical power .We are providing ventilation to the rooms also through these exhaust fans with the help of arduino microcontroller. The energy consumed by the exhaust fans somewhat recover by this technique. It is economical setup and non-polluting so power generation not affects other environment. It provides clean energy

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5. REFERENCE

- 1) "International Journal of Scientific & Engineering Research, Volume 4, Issue 8, August-2013 1184 ISSN 2229-5518 IJSER © 2013 <http://www.ijser.org>. "Producing Electrical Energy by using wastage wind energy from exhaust fans of industries" Md. Abir Hasan+, Mohammad Tanvir Hossain, Ratul Paul, Nilufer Akter
- 2) International Journal of Electrical, Electronics and Data Communication, ISSN: 2320-2084 Volume-1, Issue-9, Nov-2013 Industrial Exhaust Fans As Source Of Power 38 "INDUSTRIAL EXHAUST FANS AS SOURCE OF POWER" 1ARCHIT PATNAIK, 2S.M.ALIB.Tech Final Year Student, KIIT University, Bhubaneswar, Odisha, India Professor, KIIT University, Bhubaneswar, Odisha, India
- 3) Allwin Jose, Alan D'souza , Sarvesh Dandekar , Jitesh Karamchandani, Pavan Kulkarni Mechanical, DBIT, Mumbai, India, "Air Conditioner using Peltier Module", International Conference on Technologies for Sustainable Development (ICTSD-2015), Feb 2015, Mumbai, India