A Technique to Power Vehicles by Generation of Electricity by Induced Wind

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Abstract- *A technique of generating electricity by converting the kinetic energy of high pressure wind produced by fast moving vehicles into mechanical energy.Further this Mechanical energy is converted into electrical energy by using IC 7805 to power a vehicle.This idea would overcome the energy crisis,sky-rocketing price of gasoline and diesel which is presently used as fuel for vehicle.Moreover the wind energy is a renewable source of energy which would overcome many environmental concern.*

Keywords: Wind, Renewable Energy, Compressed air.

I. INTRODUCTION

For more than a century, hydrocarbon fuels have played a leading role in propulsion and power generation. However, increase in stringent environment regulations on exhaust emissions and anticipation of the future depletion of worldwide petroleum reserves provides strong encouragement for research on alternative fuels. As a result various alternative fuels have been considered as substitutes for hydrocarbon-based fuel and reducing exhaust emissions. More than these, Electricity generation by wind energy is a long-term renewable and less-polluting source of fuel. In addition wind energy is clean energy which does not emit COx ,NOx like other fuels .Electricity generation using wind energy does not involve any combustion or burning process.Thus , an idea to power vehicles by generation of electricity by induced wind has been initiated.

II. EXPLANATION OF INNOVATION

Routing the wind into the turbine by moving vehicle:

The moving vehicles could be a electric bike, running on roadways. The form of wind energy produced by moving bike is very unique, as it does not depend on any natural energy resource. If the wind is properly directed towards the wind turbine blades, optimum electricity may be generated. The desired direction of wind is obtained by a means for channeling wind, in the direction of the wind turbine. Routing of wind in a desired direction may be obtained by, at least one truncated cone or pyramid shaped housing or a pair of planar members converging towards the blades of the wind turbine.

Conversion of wind energy:

There are two primary physical principles by which energy can be extracted from the wind. These are through the creation of either lift or drag force (or through a combination of the two).Drag forces provide the most obvious means of propulsion, these being the forces felt by a person (or object) exposed to the wind. Lift forces are the most efficient means of propulsion but being more subtle than drag forces are not so well understood. Lift is primary due to the physical phenomena known as Bernoulli's Law. This physical law states that when the speed of an air flow over a surface is increased, the pressure will then drop. This law is counter to what most people experience from walking or cycling in a head wind, where normally one feels that the pressure increases when the wind also increases. This is also true when one sees an air flow blowing directly against a surface, but it is not the case when air is flowing over a surface.So particular designed new turbines to capture wind energy produced by the moving bike.It's almost using the helix form of turbine blades in different way. Different model of wind turbine like micro-turbine, piezoelectric bladeless turbines are installed in different parts of the bike. This types of turbine are designed such that it has an inbuilt generator. This does not have any gear arrangements for rotating the generators.Gear arrangements and belt drives are eliminated inorder to avoid wear ,tear and losses due to friction which thereby increase the efficiency and lifetime of the turbine.

Usage of IC7805 :

Due to the fluctuating wind ,there occurs a fluctuation in the electricity generated by the generator.So inorder to regulate the voltage and to make it constant 7805 voltage regulator is used.The output of the generator is directly given to the IC7805.

A regulated power supply is very much essential for several electronic devices due to the semiconductor material employed in them have a fixed rate of current as well as voltage. The device may get damaged if there is any deviation from the fixed rate. The AC power supply gets converted into constant DC by this circuit. By the help of a voltage regulator DC,

unregulated output will be fixed to a constant voltage. The circuit is made up of linear voltage regulator 7805 along with capacitors and resistors with bridge rectifier made up from diodes.

IC 7805 is a DC regulated IC of 5V. This IC is very flexible and is widely employed in all types of circuit like a voltage regulator. It is a three terminal device and mainly called input ,output and ground.

The output from the voltage regulators after passing through the charging circuit is directly connected to a charge storing device.

Storage of charge:

Since the energy from the wind is a fluctuating energy,the energy obtained must be stored properly with minimum loss of energy for proper utilization of the charge.This can be done by using a appropriate battery to store the incoming voltage which can be utilized for further use.

III. THEORITICAL POWER CALCULATIONS

The power in the wind is proportional to:

a) the area of windmill being swept by the wind

b) the cube of the wind speed

c) the air density - which varies with altitude.

The formula used for calculating the power in the wind is shown below:

Power = (density of air x swept area x velocity cubed)/2

$$P = \tfrac{1}{2}.\ \rho(A)(V)^3$$

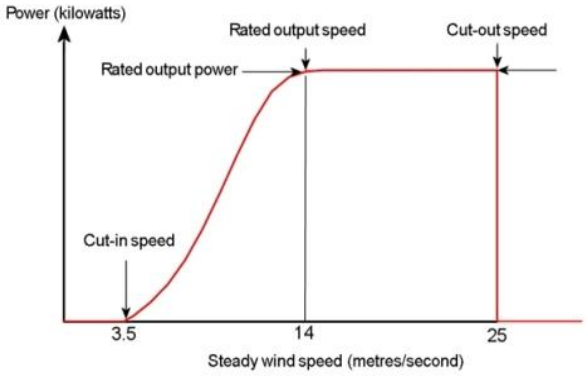
Where,

P is power in watts (W)

ρ is the air density in kilograms per cubic metre (kg/m3)

A is the swept rotor area in square metres (m2) & V is the wind speed in metres per second (m/s).

IV. ENERGY ECONOMICS



Typical wind turbine power output with steady wind speed.

From the above plotted graph,it is studied that the energy consumed completely depends upon the speed of the wind.However, the power output from the wind machine is proportional to cube of the wind speed and so a increase in wind speed will mean a significant increase in power and a subsequent reduction in unit costs.

V. ADVANTAGES

1.Wind energy in itself is a source of renewable energy which means it can be produced again and again since it is available in plenty. It is cleanest form of renewable energy and is currently used many leading developed and developing nations to fulfill their demand for electricity.

2. Dependence on the fossil fuels could be reduced to much extent if it is adopted on the much wider scale by all the countries across the globe. It could be answer to the ever increasing demand for petroleum and gas products. Apart from this, it can also help to curb harmful gas emissions which are the major source of global warming.

3. The main cost is the installation of wind turbines. Also, when combine with solar power, it provides cheap, reliable, steady and great source of energy

4. A common method of this design is that even small turbines require a fast wind before they start operating. Small turbines can be used to generate more power and can be used for commercial applications as we store the retrieved energy in batteries.

5.Since, only microturbines are used with in- built generator vibration due to rotation of turbine blade is eliminated.

6.Only Integrated circuits are used in this bike which are of light weight and low cost ,So it does not affect the efficiency of the bike.

VII. CONCLUSION

The technique is expected to save the energy source for our future generation and to save our fragile planet ,the earth.

The potential of producing the electricity from the renewable source ,is enough to power the bike.

The technology is expected to contribute to the cause of the environment as it helps to reduce carbon emissions and also assists the government in saving on fuel and to reduce the cost of the fuel.

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