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System Design and Implementation Reinforcement of the Power of the Wind Electrical Energy in the Car

[1]Muhammet Gümüşsoy and *[2]Fatih Başçiftçi
[1]Aksaray Technical Sciences Vocational Schools, Aksaray University, Aksaray, Turkey
*[2]Faculty of Technology, Department of Computer Engineering, Selçuk University, Konya, Turkey

Abstract:

Automobile technologies have progressed at an amazing rate in the last 20 years. But 30-year-old vehicles are still used today, the purpose or target of our technology is to use it in the old cars in order to be more active and efficient. Also for nearly 20 years while studies being done on solar energy, studies or research have also been done on wind energy into electrical energy is made from a moving car, while very little work has been done on the conversion. And almost no practical work is been done on it. The prominent feature of the study of wind power into electrical energy in a moving vehicle and store this energy from the engine of the vehicle, if it needs to use stored energy by the margin engine.

Key words: Wind energy, electronically card design, renewable energy, wind turbines.

1. Introduction

It would be correct to say fuel is the most important factor which influences the establishment of the balance in the world, the fluctuation of exchange rates, quality of life, product costs and end user price. Which is because of the manufacturing of a product at every stage, energy consumption is required. In our country, most of this energy is obtained from burning of natural souced fossil fuels such as fuel oil and natural gas, with a part of it is obtained from nature by using a dam, a windmill or solar panels. It is obvious that the future is in renewable energy sources. For transportation the sun energy that obtained from solar panels is the most improved natural energy source progress at the moment [1].

The conversion of wind energy into electrical energy on any vehicle in motion is an issue that almost is not worked on it. By the designed system, a propeller which assembled without disrupting the aerodynamic structure of the vehicle provides to produce energy from moving until the vehicle is stopped. This produced energy is saved on a battery in the system by a spesific designed card provides power to margi engine from system battery when the power of magrin engine is not enough. In case of developing the system and doing required improvements even charge of the battery of electric vehicles is possible [2], [3].

In this study, a system is designed to decrease fuel consumption of vehicles, and obtain extra power without using fuel, just getting help wind power that generated of vehicle motion for the parts that needs high energy like air conditioner and margin engine. This study, that includes various using areas, can be applied all vehicles like train,bus, ship, car, motorcycle, etc. Also it can be used by renewable energy source for electricitied vehicles and on the state of using to charge them during motion, system obtaines to increase distance and also decreases charging cost [4],[5].

*Corresponding author: Address: Faculty of Technology, Department of Computer Engineering Selçuk University, 42003, Konya TURKEY. E-mail address: basciftci@selcek.edu.tr, Phone: +903322233353

2. Materials and Method

Wind turbines; consists of rotor, shaft and a alternator (generator) that converts the kinetic energy of the wind into electrical energy. As the wind pass through the rotor, the rotor starts spinning and aerodynamic force is produced. This rotational motion moves the generator and produces electricity. The appearance of a wind turbine (nasel's body-internal structure) is shown on Figure 1.

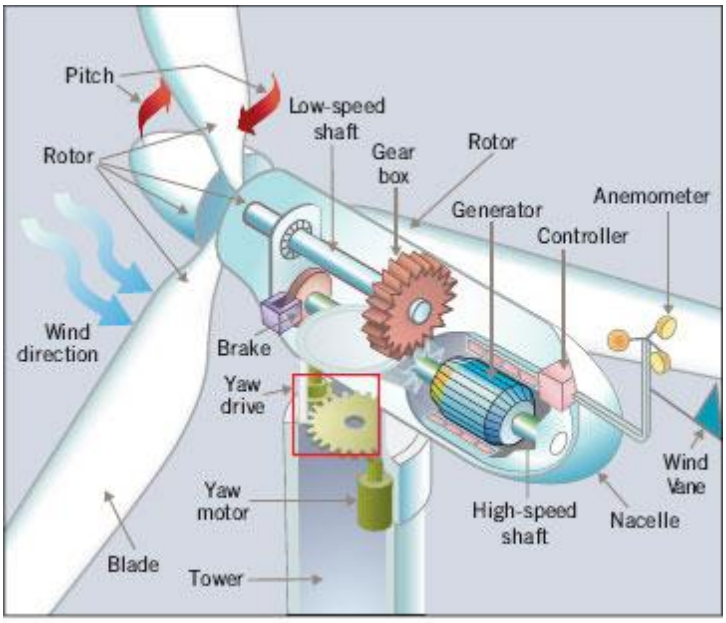

Figure1. Internal structure of the wind turbine

Prepared as cylinder form of leafy turbine (made of stainless steel material), mounted on a shaft in the middle due to which we can convey the force to the engine.

The motor we used is a DC (Direct Current) motor; a kind of engine that rotates the shaft by the electricity and also generates electricity by rotation of the shaft. The shaft of motor is placed on a hard plastic hole in the middle of the turbine. By the wind the turbine rotates the shaft of engine and provides to produce electricity.

By the designed card the battery value of vehicle is always measured. While margin engine is started, during the firing, and the battery value decreases 9 volt, the system gets the power for margin engine from system battery when the battery value of vehicle increases 10 volt, the system gets the power from battery of vehicle. The scheme of the designed card is shown on Figure 2 and the design of the card is shown on Figure 3.

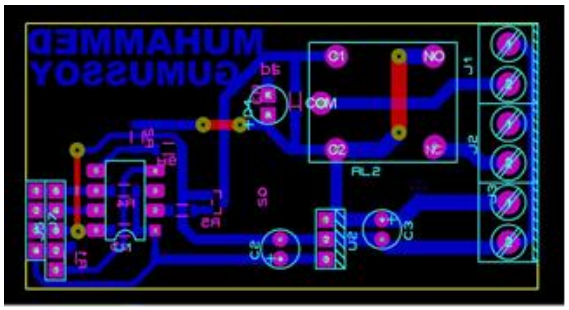

Figure 2. Scheme of card

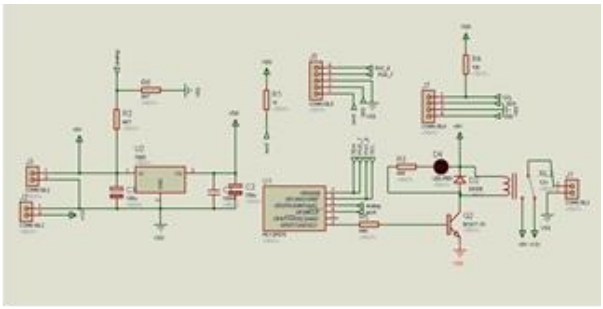

Figure 3. Design of card

3. Application

Let's review the logic of the system from beginning to end. Assembling the wind turbine, shown in Figure 4 and Figure 5, to a car, it provides the wind energy is converted to electric energy by car motion. The energy that system produced is stored to dry battery shown in Figure 6.

Figure 4. Wind entrance unit of wind turbine

Figure 5. Wind exit unit of wind turbine

Figure 6. Dry Battery

Figure 7 and Figure 8 illustrates a card that measured values of the battery. If the measured value of 12 V to 9 V is reduced to the margins engine power is to use the system's battery. If the continuously measured value of battery increases above 10 volt, the power for margin engine is got from battery of the vehicle.

Figure 7. The front face of the card

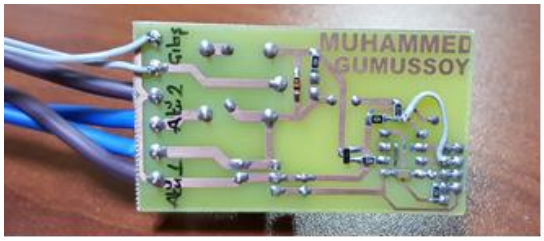

Figure 8. The rear panel of the card

4. Result

One of the most functional features of the system designed-is that it is applicable to all moving vehicles (Cars, trucks, trains, motorcycles, ships, electric vehicles, etc.). The system is easily performed while assembly of large vehicles, on the other vehicles that have narrow installation space such as automobile, motorcycle, and system can be designed as suitable for grids or air entrance area without ruining aerodynamic structure [6].

Energy production is achieved from a car in motion without using extra fuel energy. By designing turbines as described in research results, wind energy created by motion of the vehicle is converted into electrical energy. Obtained energy stored in a dry battery with too small energy loss. A card is designed to use energy more efficiently and the battery value of the vehicle is measured. When the battery value is not enough to rotate margin engine, the system obtained reinforcing from the energy saved battery and supplied margin engine to run for a while. By this way even the battery of vehicle gets empty, system battery is full, and if there is not any problem on the other parts of the vehicle, the system obtaines energy to run the vehicle.

The motor we used is a 12 volt and 0,5 ampere DC motor. The results have been taken by this motor. As putting a secondary motor on the other side of the propeller gain can be redoubled. Enlarging the propeller and the other equipment and using two of 12 volt and 0,5 ampere DC motors it is possible to gain four times. In our design as long as the vehicle is in motion; movement speed, based on the provision of continuous variables such as wind direction and wind speed continual energy production will be provided. We did the measurements by applying the prototype tool that we built to work on a sample as shown in Table 1 below.

According to this information and measurements on a 2003 model passenger vehicle with 1,6 liter engine, it is found that the system has increased the duration of margin about 35 seconds.

Table 1. The measurement results of a prototype work *

Speed (km/h)	Measured Value (V)	Ampere (A)
30	2,5 – 3	0,10
60	5 – 6	0,15
90	9 – 10	0,30
120	11,5 - 12,5	0,45

* speed is measured on a windy day 10 km/h fast-moving vehicle, on the direction of wind

Table 2. The measurement results of a prototype work**

Speed (km/h)	Measured Value (V)
30	3,5 – 4,5
60	6 – 7
90	10,5- 11
120	12,5 – 13,5

** speed is measured on a windy day 10 km/h fast-moving vehicle, in the opposite direction of wind

Acknowledgements

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