

Quad Power bike

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ABSTRACT

As we all know the fuel prices especially the petrol has been on a rise substantially day by day. Again the pollution due to vehicles in cities is increasing continuously. To overcome these problems, an effort is being made to reduce the harmful effect of the pollution and thereby by finding an alternative source of energy for the vehicles. It is not wise and economical to purchase a vehicle to all the class of the society but the need to a private vehicle becomes of upmost importance for daily commute thus by keeping this in mind to cater these need of economically low masses as well as to provide a solution for the environmental pollution and global warming is in progress. The Quad Powered Bicycle is under development is driven by DC motor fitted in front or rear axle and is operated by solar energy, wind energy, friction and eventually by the mechanical power. Thus by developing a Quad Powered Bicycle which will be a resolution to the growing environmental problems as well as a step towards the green revolution.

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I. INTRODUCTION

The Quad Powered bike will be an obsolete resolution for the daily commute of the people. The user of the Quad Powered bike will be using very less amount of energy when it comes to riding of the bike. The Quad power Bike will have the Solar Panel Fitted at the careers place on the bike, the Wind energy kit at the front wheels mudguard and the ring type dynamos on either the front or the rear wheel. With the Conventional energy research advancing in the pace like it's never been before and also the government implying and making various deals on these energy resources it becomes necessary to do research or use the applied energy in order to bring up something beneficial for the Earth as well. The Quad Powered Bike is an example of the same. The Solar energy being the prime component of the Quad Powered Bike as it is the basic source of energy by the sun. The energy is produced by the Nuclear Fusion process in the sun. Thus the sun releases the enormous amount of Solar Energy due to continues fusion reaction taking place in the sun. The sun sends out the energy in the form of radiations at the rate of 3.7×10^{23} MW. However, the energy intercepted by the earth is about 1.85×10^{11} MW. The Energy used by the sun would be free from pollution, Low operation and maintenance cost for the solar panel. This helps in the stabilisation of the temperature of the Earth

there by reducing the Global Warning Potential. Now the Wind energy circuitry is used to increase the reliability of the system. Now if the Solar energy circuitry fails then there must be a force or a charge which will help and allow the system to run through the adverse effects of the nature or the system. Thus the wind energy circuitry will be beneficial in such cases as the bike will move further it will cut the viscous forces of the air and by that force the fan of the wind circuitry will rotate and the rotation which is caused will help the kit to generate the electricity which will be stored in the battery there by giving an added advantage and increasing the reliability of the system. Again adding the benefits of this source will be its free of charge and inexhaustible. It's a clean energy source and non-polluting, it has low maintenance cost. The dynamos will be used to lit up the lights and the speedometer which will be used in order to make it a smart bike. If the entire system fails then we will have the mechanical energy resource to get the bike to the service centre or back to users home.

II. METHODOLOGY

The Energy from all the sources will be passed on to the DC motor which is placed at the rear axle housing of the Bicycle there by converting the Electrical energy back to the

Mechanical energy (Rotational) thus revolving the rear tire of the bike and giving the motion to the cycle. The solar panel used in this system is as shown in the fig.1 of the paper.

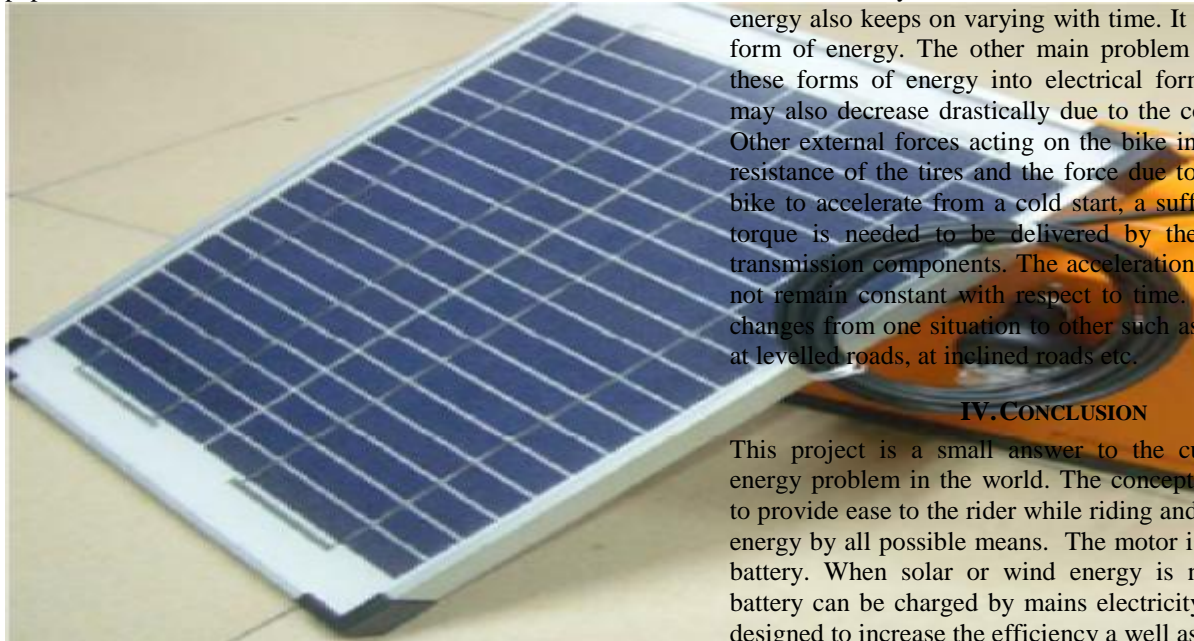


Fig. 1 Solar Panel

Table. 1 Specifications of the solar panel

Maximum Power	20
Charging Current	2
Open circuit Voltage	21.6
Maximum Power Voltage	17
Short Circuit Current	1.316
Power Measured at standard test conditions	1000W/m ² at 25 degree Celsius
Lifespan	20-25 years
Size	500mm*338mm*35mm

In order to store the charged current from the Solar panel and the Wind energy Kit we use lead acid batteries. The lead acid batteries are one of the most popular types of battery in the electronic systems. They are slightly lower in density than lithium, lead acid is safe, provided certain precautions are met when charging and discharging of the battery takes place. This have a many advantages over other conventional types of batteries, the lead acid battery may prove to be the wise choice for a Quad Powered Bike. As the charge controller will convert the energy from solar to electrical the battery will be charged and will be discharged if used. Now this leads to various complications while manufacturing the bike.

III. PROBLEMS

The main problem for producing the bike would be of charge and discharge. Three lead batteries which will be in parallel connection will be a difficult task to charge and discharge those batteries simultaneously. Extensive work is going on to help to get rid of the problem. Then the drag which would be acting on the fan of the wind energy kit can cause a lot of problems in the generation of electricity, thus the research was done on that front and a solution was chosen to get the fan in sideways which will reduce the drag at a considerable amount. Design of system and placing it on the bicycle is difficult due to large variation of wind

speed from time to time and season to season. The problems associated with solar energy are that it is a very dilute source of energy and spread out. The maximum solar flux available is only 1KW/m² of area. The availability of solar energy also keeps on varying with time. It is an intermittent form of energy. The other main problem is of converting these forms of energy into electrical form. the efficiency may also decrease drastically due to the conversion losses. Other external forces acting on the bike include the rolling resistance of the tires and the force due to gravity. For the bike to accelerate from a cold start, a sufficient amount of torque is needed to be delivered by the motor and the transmission components. The acceleration requirements do not remain constant with respect to time. The requirement changes from one situation to other such as at starting time, at levelled roads, at inclined roads etc.

IV. CONCLUSION

This project is a small answer to the current increasing energy problem in the world. The concept of the project is to provide ease to the rider while riding and also to conserve energy by all possible means. The motor is powered by the battery. When solar or wind energy is not available the battery can be charged by mains electricity. This system is designed to increase the efficiency as well as the reliability of the bicycle. It can be used widely for short distance travelling. Ideally this bicycle should have a range of about 40 to 45 kms. It is simple in construction and needs less maintenance. It can also serve as a viable alternative for the increasing environmental pollution due to the overuse of the conventional vehicles.

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