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Design and Fabrication of Low Cost Electric Bicycle

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Abstract - *Now days the automobile industry become more competitive the vehicles can get the energy from petrol or diesel engine for its drive. The recent years e-bike became more attractive and less maintenance cost. However only drawback of e-bike is requires frequent charging form EB supply. In this project is based charging arrangement on the e-bike. The motor is used the electric energy from battery and battery can receive electric energy from hub dynamo. This energy is stored in battery. Market available e-bike batteries are designed to spent 6-8 hours/charge by using EB supply. This e-bikes running cost is very low, when compare to other sources of energy. Today available e-bike are using3-4numbers of 12v batteries. In this project only use one 24v battery, the battery cost is reduced. These batteries are charged by Hub dynamo. The electric supply cost also reduced.*

***Key Words*: Hub Dynamo; Motor; Battery; Cycle; V Belt.**

1. INTRODUCTION

India is the second most popular nation in the world. Like many other countries where agriculture is the main activity, biomass and other non – commercial fuels constitute around 40% of energy requirements in India. Around 85.49% of Indian villages are electrified. People use bicycles as the main medium of transportation in villages. In addition in cities, where most people use exercise bikes, the energy can be productively used to power electronic gadgets, which require less power.

In India, many of the villages are still without electricity and most of them use bicycle as their medium of transportation. In such places, our system will be of great help. Charging of the battery can be done by a layman by just connecting the circuit to the output of the dynamo which is connected to the bicycle. This would charge the li-ion batteries.

World is a storehouse of energy. And according to energy conversion law, energy neither be created nor be destroyed but can be transformed from one form to another. But we are wasting resources that can produce energy as if they are limited. Humans are able to generate approximately 150W of power while riding bicycle. However, this power goes waste without any use. If this is making use of this energy, would be able to power many electronic devices.

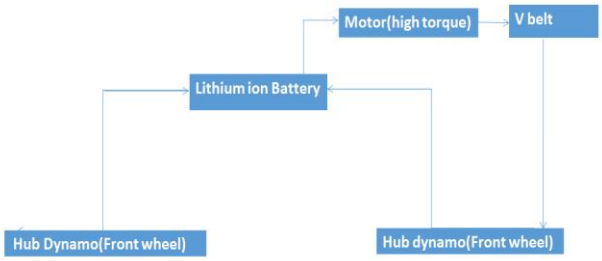
A dynamo or an alternator can be used for harvesting the energy generated by a cycle rider while riding. We can charge mobile phones or a small lighting device with the power. Not only in bicycle but also in alternator bikes, cars and exercise bikes use this principle.

2. WORKING PRINCIPLE OF E-BICYCLE

If you have dynamo-powered bicycle lights, you already own an electric-powered bicycle. You pump your legs up and down on the pedals, you make the wheels rotate. A small dynamo (generator) mounted on the rear wheel produces a tiny current of electricity that keeps your back safety lamp lit in the dark. Now suppose you could run this process backward. What if you removed the lamp and replaced it with a large battery. The battery would kick out a steady electric current, driving the dynamo in reverse so that it spun around like an electric motor. As the dynamo/motor turned, it would rotate the tire and make the bike go along without any help from your pedaling. It may sound a bit far-fetched, but this is more or less exactly how electric bikes work.

The batteries are the most important parts of the bike, because (if you don't do any pedaling) they contain all the power that will drive you along. Typical electric bike batteries make about 350–500 W of power (that's about 35–50 volts and 10 amps), which is about a quarter as much as you need to drive an electric toaster. In theory, you could use any kind of battery on a bicycle. In practice, however, you want to use something that stores lots of power without being too heavyor you'll be using half your power just moving the battery along! That tends to rule out heavy lead-acid batteries like the ones that start cars, though some electric bikes do use them Light weight lithium-ion batteries, similar to those used in laptop computers, mobile (cellular) phones, and MP3 players, are now the most popular choice, though they're more expensive than older rechargeable battery technologies such as nickel-cadmium ("NiCad"). Typical batteries will give your bicycle a range of 10–40 miles between charges (depending on the terrain) and a top speed of 10–20 mph (which is about the maximum most countries allow for these vehicles by law). You can extend the range by pedaling or free-wheeling some of the time.

BLOCK DIAGRAM



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We had the dynamo/motor driving the back wheel directly, simply by pressing on the tire. Most electric bikes work a different way. They have compact electric motors built into the hub of the back or front wheel (or mounted in the center of the bike and connected to the pedal sprocket). Take a look at the hub of an electric bike and probably you'll see it's much fatter and bulkier than on a normal bike.

3. ADVANTAGES

Pedaling is optional. Ride at speeds of up to 20+mph. Ride up long distance. Eco Friendly. No pollution. Not have to pay for gas. Reduce your dependence on foreign oil. No license or insurance required. Perfect for rehabilitation. Fun to ride - Relieve stress.

4. DISADVANTAGES

A motor that cannot exceed 250Wofpower.Maximum speed of 25 Km/hr. They cannot weigh more than 40 Kg.

3. CONCLUSIONS

At a time when there is energy crisis casting its shadow all over the world, one has to look into alternator renewable energy sources. One such alternator way to generate power is presented in this paper. The rotating energy of the tries in the bicycle, generated by dynamo can be used to operate small powered devices.

The issues associated with electric bicycles may be addressed by custom-designed drives that are most efficient over a given operating cycle. The results of the studies listed here can serve as a platform to improve electric bicycle performance, if new drive systems are designed around key parameters that will result in improvement of the system performance. Furthermore, they can be used for comparison of existing drives in a systematically, comprehensive, and technical way.

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