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E-BIKE FOR DEAF PEOPLE

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Abstract- *Through this project, we interviewed many of the e-biker and found that there are four benefits unique to the riding of e-bikes: Speed, Acceleration, Green, and Enabling. They are fast so that e-bikers can cut down their commute time and allow them to ride more frequently than if they ride traditional bikes, especially during hot and windy days. The ease of acceleration makes obeying stop signs or riding uphill less onerous and provides e-bikers with more confidence when only vehicle lanes are available to bikers. They also provide those who, for various reasons, don't or can't ride traditional bikes an option for green transportation. Finally, they enable people with certain disabilities, because of illness or aging or time constraint, to continue to bike, with the help of electric motors when needed. The barriers to the expansion of e-bike ridership are Cost (Rs.33000 on average), Heavy weight, Infrastructure (unsafe roads and communities, and lack of emergency charging), and policy (some bike lanes are not open to e-bikes). However, those barriers can be overcome with some small government and business interventions. In this we use vibration sensor to inform about the direction instructions to the deaf person, we also use accident alert notifying system through which a message is send to their family members with location in case of accident. We use TP4056 module for making of balance charger in this we also use LM317 IC for protection.*

Keywords: **Accident alert notifying system, LM317 IC, TP4056 module, E-bike, Vibration sensor.**

1. INTRODUCTION

Bicycles have always been a popular mode of transportation due to their low cost, ease of use, health benefits and mobility. Their drawbacks however include a low practical range, requirement of more human efforts as compared to a car or bike, and safety concerns in urban areas.

A hybrid electric bicycle, is a bicycle which uses electric motor for propulsion. It can not only addresses a regular bicycle's drawbacks but can also contribute in reduction in emissions from vehicles and to save environment. Additionally included features may make it more useful and appealing to people and society that normally would not consider commuting on a bike.

Very broadly, e-bikes can be classed as:

- E-bike or Pedelec or pedal-assisted, and power-assisted bicycle: motor assists only up to a decent but not excessive speed (usually 25 km/h), motor power up to 250 watts, often legally classed as bicycles.
- Electric motorbike" or "e-motorbike" refer to more powerful models that attain up to 80 km/h (50 mph) and uses more powerful motors legally classed as a moped or motorcycle. (**not** a bicycle)

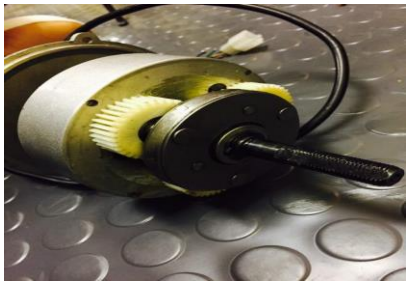
1.1. Motors and drive trains

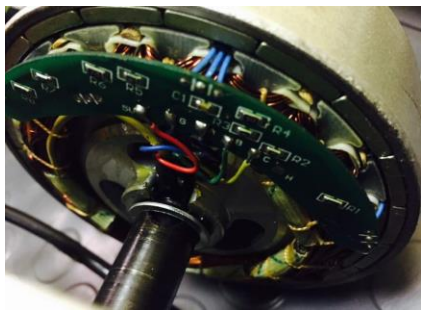
The two most common types of hub motors used in electric bicycles are brushed and brushless. There are many possible types of electric motorized bicycles with several technologies available, varying in cost and complexity; direct-drive and geared motor units are both used. An electric power-assist system may be added to almost any pedal cycle using chain drive, belt drive, hub motors or friction drive. BLDC hub motors are a common modern design with the motor built into the wheel hub itself and the stator fixed solidly to the axle and the magnets attached to and rotating with the wheel. The bicycle wheel hub is the motor. The power levels of motors used are influenced by available legal categories and are often, but not always limited to under 750 watts.

Another type of electric assist motor, often referred to as the mid-drive system, is increasing in popularity. With this system, the electric motor is not built into the wheel but is usually mounted near (often under) the bottom bracket shell. In more typical configurations, a cog or wheel on the motor drives a belt or chain that engages with a pulley or sprocket fixed to one of the arms of the bicycle's crankset. Thus the propulsion is provided at the pedals rather than at the wheel, being eventually applied to the wheel via the bicycle's standard drive train

1) A gear box system with center mounted shaft and all circular gear system jaw teeth can be employed in a bicycle or some mechanical work conveyer device to perform circular work.

2) Shaft with copper winding attached basically configuration to rotate the shaft using electrical energy to obtain some mechanical work.





3) It's the back shaft portion of gear box some tri pattern gear system configuration. It produces mechanical work.

4) This is some chipset configured to winding and may be used as control or energy conversion or transfer unit.

1.2. Batteries

E-bikes use rechargeable batteries. Battery systems in use include sealed lead-acid (SLA) , nickel-cadmium (NiCad) , nickel-metal hydride (NiMH) or lithium-ion polymer (Li-ion).

a) Sealed lead acid

This type of battery is cheap and has a high energy density. However, it is very heavy and cannot be used for a long time.

b) Lithium ion battery

These batteries are used by most of the people because they are lighter in weight and can be fast charged. Besides, this type of battery has a long life. But lithium-ion batteries are somewhat expensive.

c) Lithium iron phosphate

This is the latest type of electric bike battery. It is also light weight and has a long life. However, since it is a new technology, it is costly.

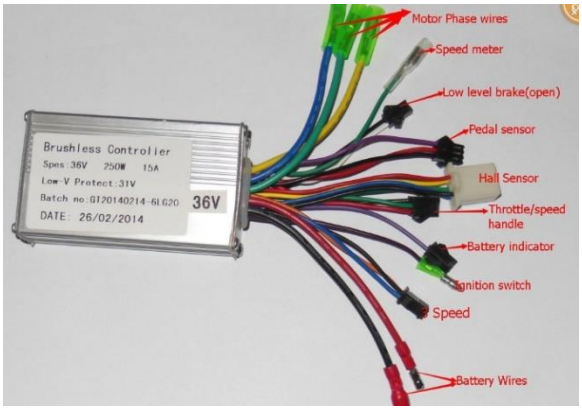
Batteries vary according to the voltage, total charge capacity (amp hours), weight, the number of charging cycles before performance degrades, and ability to handle over-voltage charging conditions. The energy costs of operating e-bikes are small, but there can be considerable battery replacement costs. The lifespan of a battery pack varies depending on the type of usage. Shallow discharge/recharge cycles will help extend the overall battery life.

Range is a key consideration with e-bikes, and is affected by factors such as motor efficiency, battery capacity, efficiency of the driving electronics, aerodynamics, hills and weight of the bike and rider.

1.3. Controller

There are two distinct types of controllers designed to match either a brushed motor or brushless motor. Brushless motors are becoming more common as the cost of controllers continues to decrease.

Controllers for brushless motors: E-bikes require high initial torque and therefore models that use brushless motors typically have Hall sensor commutation for speed and angle measurement. An electronic controller provides assistance as a function of the sensor inputs, the vehicle speed and the required force. The controllers generally allow input by means of potentiometer or Hall Effect twist grip (or thumb-operated lever throttle), closed-loop speed control for precise speed regulation, protection logic for over-voltage, over-current and thermal protection. Bikes with a pedal assist function typically have a disc on the crank shaft featuring a ring of magnets coupled with a Hall sensor giving rise to a series of pulses, the frequency of which is proportional to pedalling speed. The controller uses pulse width modulation to regulate the power to the motor.



1.4. Accident alert notifying system

In this GSM, GPS, and vibration sensor is used. When no vibration is detected then output is zero but if any vibration detected then output is high. Now, if these vibrations exceed the value e.g.4000 then it gives the message alert to the 10 mobile numbers we feed it with location. So, this system insert for the people protection.

2. HOW IS IT HELPFUL FOR DEAF PEOPLE ?

- It will use mobile bluetooth , arduino board , and vibration sensor connected with each other. Each direction indication to feel by the deaf person is different.
- For left we will use for(i=0;i<2,i++) which gives 2 beeps with delay .
- For right , for(i=0;i<3,i++) which gives 3 beeps with delay .
- For U turn it will use fade program (Analog write)
- For T POINT we will make it vibrate continuously with same pace.

3. Environmental effects

E-bikes are zero-emissions vehicles, as they emit no combustion by-products. However, the environmental effects of electricity generation and power distribution and of manufacturing and disposing of (limited life) high storage density batteries must be taken into account. Even with these issues considered, e-bikes are claimed to have a significantly lower environmental impact than conventional automobiles, and are generally seen as environmentally desirable in an urban environment.

The environmental effects involved in recharging the batteries can of course be minimized. The small size of the battery pack on an e-bike, relative to the larger pack used in an electric car, makes them very good candidates for charging via solar power or other renewable energy resources. Sanyo capitalized on this benefit when it set up "solar parking lots," in which e-bike riders can charge their vehicles while parked under photovoltaic panels.

Both land management regulators and mountain bike trail access advocates have argued for bans of electric bicycles on outdoor trails that are accessible to mountain bikes, citing potential safety hazards as well as the potential for electric bikes to damage trails. A study conducted by the International Mountain Bicycling Association, however, found that the physical impacts of low-powered pedal-assist electric mountain bikes may be similar to traditional mountain bikes.

A recent study on the environment impact of e-bikes v/s other forms of transportation found that e-bikes are:

- 18 times more energy efficient than an SUV
- 13 times more energy efficient than a sedan
- 6 times more energy efficient than rail transit
- And, of about equal impact to the environment as a conventional bicycle.

4. Future Use of Electric Bicycle

Most participants stated that they would use e-bikes more. Many of the users feel that the more they e-bike, the more likely they will use e-bikes for their trips. Incentives such as subsidies given by employers to e-biking and biking to work, or at-the-pump gas price increases to Rs.300/gallon (E-bikes are much more popular in Europe), or improving the infrastructure on the routes from home to work to increase safety, comfort, and range-confidence for e-biking, or simply finding ways to reduce the cost of e-bikes, or some combination of these measures. Furthermore, as a reflection of the aging of Baby-Boomers, some participants we interviewed saw the e-bike primarily as a tool for transportation, as opposed to recreation . Most of them described using the e-bike as an —equalizer allowing them to keep up with a spouse, friend or family member who is a faster cyclist. This widely held perception (about the e-bikes being primarily for transportation) among the interview participants seems to run counter to dominant idea in the general population that a bicycle is primarily for exercise or recreation. When the participants were asked what their families, peers and colleagues thought about their e-biking, though some viewed as interesting and cool, a very common response was that they were told using a bike with an electric motor was cheating. If the primary purpose of a bicycle is indeed to get exercise, then this contention makes sense. However, it makes no sense when talking about something that is primarily a transportation vehicle; it would seem ludicrous to most people to make the suggestion that using a motorized car was cheating one participant, who sells e-bikes, eloquently expressed his frustration with this perception of bikes and e-bikes as recreational equipment. I know a lot of people view them as toys, and recreational equipment. I wish people would take it a little more seriously. This is transportation. They come in and laugh and say, maybe when I'm old. And then put their 5,000 dollar carbon bike on the back of your SUV because you're too scared to ride on the road. And you call that a road bike. It's like, come on, let me change your life. I'll give you an e-bike, a real one with some big fat tires on it so you can take the potholes, and you don't have to show up all sweaty and you really can take this seriously as an alternate form of transportation. This information may indicate that the market for e-bikes is a subset of the portion of the population that views bicycling as a legitimate form of transportation, instead of recreation. This involves public education in the Unite State, where cycling should not only limit to recreation and exercise. Our participants have proven the feasibility of biking for transportation. Expanding this perception is likely an important step to increasing bicycle mode share in general; the advantages of e-bikes that were identified by participants also have potential to expand the subgroups for whom using a bicycle as transportation is feasible. Therefore, improving conditions for conventional bikers is just as important as for e-bikers. A bike-friendly community is in general an e-bike friendly one.

5. CONCLUSION

Conclusion With the increasing consumption of natural resources of petrol, diesel it is necessary to shift our way towards alternate resources like the Electric bike and others because it is necessary to identify new way of transport. Electric bike is a modification of the existing cycle by using electric energy and also solar energy if solar panels are provided, that would sum up to increase in energy production. Since it is energy efficient, electric bike is cheaper and affordable to anyone. It can be used for shorter distances by people of any age. It can be contrived throughout the year. The most vital feature of the electric bike is that it does not consume fossil fuels thereby saving crores of foreign currencies. The second most important feature is it is pollution free, eco- friendly and noiseless in operation. For offsetting environmental pollution using of on board Electric Bike is the most viable solution. It can be charged with the help of AC adapter if there is an emergency. The Operating cost per/ km is very less and with the help of solar panel it can lessen up more. Since it has fewer components it can be easily dismantled to small components, thus requiring less maintenance.

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REFERENCES

[1] Aikenhead, G. S.,"Bicycle Applications for On-Board Solar Power Generation", pp. 9-10, 2011.

[2] Barve, D. S.,"Design and Development of Solar Hybrid Bicycle", International Journal of Current Engineering and Technology, pp. 377-380, 2016.

[3] Barve, D. S.,"Design and Development of Solar Hybrid Bicycle", International Journal of Current Engineering and Technology, pp. 378-379, 2016.

[4] Barve, D. S.,"Design and Development of Solar Hybrid Bicycle", International Journal of Current Engineering and Technology, pp. 380, 2016.

[5] FOGELBERG, F.,"Solar Powered Bike Sharing System", Goteberg,Sweden: Viktoria Swedish ICT, 2014.

[6] FOGELBERG, F.,"Solar Powered Bike Sharing System with", Goteborg, sweden: Viktoria Swedish ICT, 2014.

[7] GOODMAN, J. D.,"An Electric Boost for Bicyclists", The New York Times, 2010.

[8] Prof. Palak Desai, P. D.,"Design And Fabrication Of Solar TRI Cycle", International Journal of Engineering Sciences & Research, pp. 664, 2016.

[9] T.Bhavani,"Novel Design of Solar Electric Bicycle with Pedal", International Journal & Magazine of Engineering, pp. 108, 2015.