Design and Development of Electric Solar Two Wheeler (RAYRACER)

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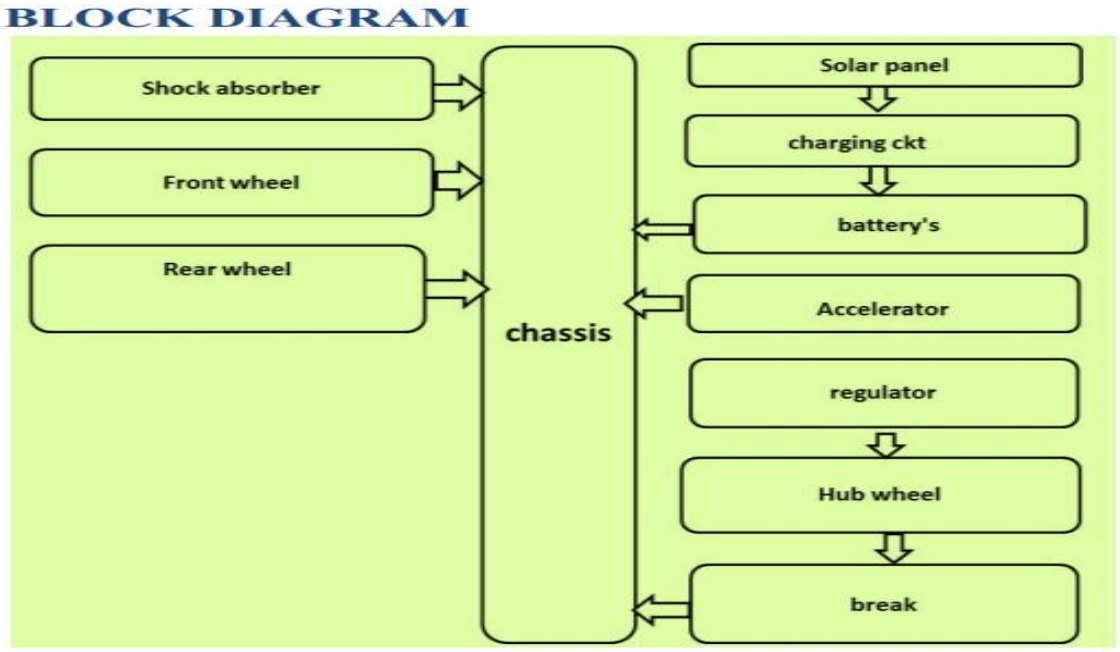
Abstract- Electric bike are plug-in electrical vehicles with 2 or 3 wheels that may be recharged from any external supply of electricity, and therefore the electricity is keep during a reversible battery, that provides power to 1 or a lot of electrical motors to achieve movement. The electricity generated from AN external supply helps in acceleration of the bike. The speed of this cycle is restricted and therefore the electricity is generated employing a solar battery. The generated electricity is keep mistreatment a battery and the locomotion and movement of the vehicle is thence propelled employing a motor. The bike would like not be unendingly fed with solar power so as to achieve the capability to run. It gets its energy from the batteries wherever the energy is keep. Conventionally, these sorts of vehicles are arduous to use with the assistance of simply energy. The energy we tend to get from human effort. however, once energy is regenerate mistreatment solar power and battery, it becomes less difficult and useful within the propulsion of the bike. The bike, not mistreatment AN engine, becomes AN effective manner of road transport as it causes no pollution. it's eco-friendly and it positively reduces human effort.

Keyword: E-bike, motorcycle, solar e bike, solar panel

1. INTRODUCTION

The project is to design a Bike with renewable solar energy. Solar Bike aims to be a small research and development that develops renewable technology and helps everyone start riding electric bicycles around rather than using their cars. A sun based board is a level rectangular formed gadget, ordinarily somewhere close to the extent of a radiator and the measure of an entryway, made up of numerous individual photovoltaic vitality authorities called sun powered cells secured with a sheet of glass on its surface. The cells, each of which is about the size of a palm of an adult, are usually octagonal in shape and coloured bluish black. Like the cells in a battery, the cells inside a sun oriented board are intended to create power; yet where a battery's cells make power from synthetic concoctions, a solar panel's cells produce power by capturing sunlight instead In this project we are going to use solar panel and DC hub motor. The voltage created by the sun powered board is put away in battery (48V/20AH) through charging circuit. From the battery, power will be provided to the DC centre engine (48V/200W) through quickening agent pursued by door switch. The purpose of gate switch is when break is applied then automatically it opens the connection between motor and accelerometer.

The wheel centre engine is an electric engine that is consolidated into the centre of a haggle it specifically. Centre point engine electromagnetic fields are provided to the stationary twisting of the engine. The external piece of the engine thus pursues, those fields, turning the wheel connected.



2. TECHNICAL SPECIFICATIONS

Motor

Motor type -brushless dc

Motor power -250w

Battery

Type of -VRLA

Voltage -48v

Capacity -20Ah

Series connection

Charger -12v/5w*6

Parallel -30w

Retire -43 V. 2.5A

Charging time -8-10hrs.

OPERATIONAL

Maximum Speed -25 Km /1Hr

Range (Distance/Charge) - 70 Yam' (under

standard rest Seat)

Vehicle Kerb Weight -84kge

Standard/Maximum bad carrying capacity- 60KF/100 Kg:

Frame -high rigidity tubular

Shock absorbers type (Front@ Rear) - spring boded

Hydraulic: Damper

TYRE SIZE

Front and Rear -16''*3''

TYRE PRESSURE

Front - 25 PSI

Rear -35 PSI

Wheel Type -Alloy-wheel

BRAKES

Front and Rear - Hand operated. Drum Brake 110man Dia

Bub (all lighting system) - 12 V

Choice of body color (metallid)-cheering Red. Quiok

Silver. Misty Grey

Reg4tratica Rewired

Drum brake

3. CAD MODEL OF THE VEHICLE

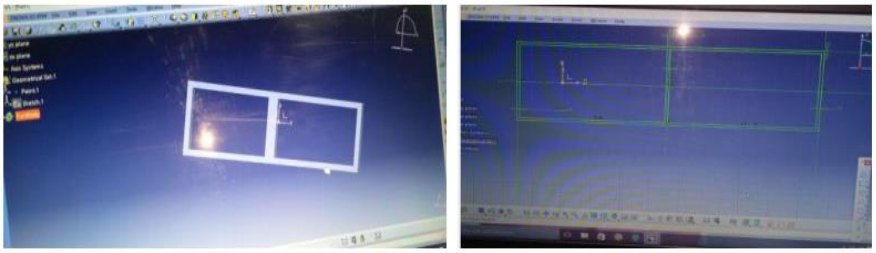
Front View; Isometric View; Back View

Side View

Table 1 Initial Dimension

Length:	170 cm
Width:	50 cm
Height:	122 cm
Ground Clearance:	26 cm
Wheel Base:	1980 mm

Table 3 Chassis Analysis by APDL, ANSYS



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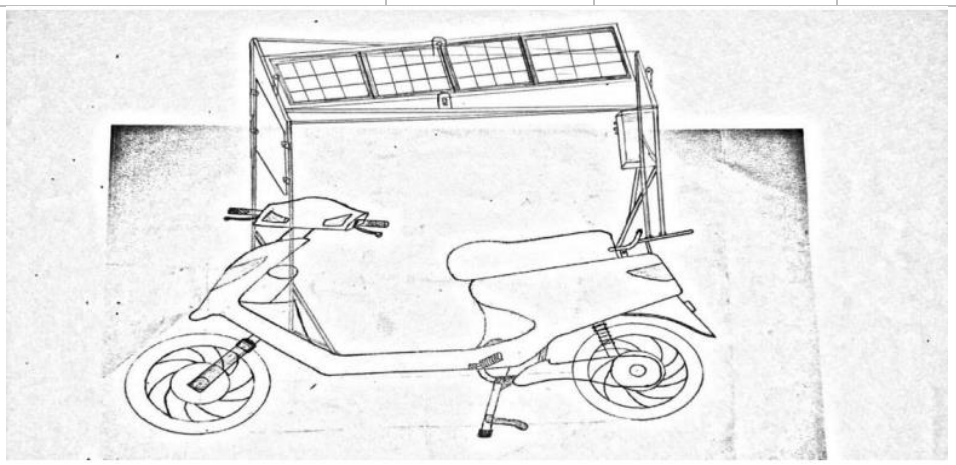
ANALYSIS TYPE	FORCE Applied	Max Stress (M Pa)	Factor of Safety
TORSIONAL ANALYSIS	1000 N – (2G)	31.9	1.09
FRONT IMPACT ANALYSIS	1000 N – (4G)	12.084	3.01
REAR IMPACT ANALYSIS	1000 N – (4G)	0.11608	2.54
SIDE IMPACT ANALYSIS	1000 N - (3G)	0.11860	3.4



Body diagram

48V500W CONTROLLER FOR HUB MOTOR

III.SOLAR PANEL

4. SOLAR PANELS

A sustainable power source asset is a characteristic wellspring of vitality which can be renewed with the progression of time, either through organic procedure of generation or some other common procedures. Inexhaustible assets are a piece of Earth's regular habitat and the biggest segments of its ecosphere. 16% of aggregate worldwide vitality utilization originates from sustainable power source assets.

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5. HUB MOTOR

Centre point engine electromagnetic fields are provided to the stationary windings of an engine. The external piece of the engine pursues those fields that turn the wheel that is joined. In a brushed engine, vitality is exchanged by brushes which are in direct contact with the pivoting shaft of the engine. In a brushless engine, the Energy is exchanged electronically, with no physical contact among stationary and moving parts. In spite of the

fact that the brushless engine innovation is progressively costly, the greater part of them is more productive and longer-enduring than brushed engine frameworks.

6. ADVANTAGES

1. Conservation of Non Renewable energy sources.
2. Maximum output can be obtained.
3. It doesn't cause any ecological contamination like the non-renewable energy sources and atomic power.
4. Sun oriented cells last a more drawn out time and have low running expenses
5. Low power consumption.
6. Conservation of energy.
7. Usage of free accessible wellspring of vitality from sun
8. Storage of energy into rechargeable battery.
9. Put away vitality is utilized for running centre point engine.
10. High efficiency can be achieved using inverter.

7. FUTURE SCOPE

Solar Powered E bike is mainly intended to fabricate a bike which runs with renewable energy i.e., the solar energy. In this project we are using solar panel for charging a Lead Acid Battery (12V, 1.2 Amp hrs), a Pettier the myoelectric device which when connected to battery generates cooling effect on one side and warmth is scattered on opposite side through warmth sink, a cooling fan is utilized for dissemination of warmth from the warmth sink.

8. CONCLUSION

Sun oriented vitality, a sustainable wellspring of vitality is an up and coming structure, which if legitimately utilized, can offer ascent to enormous vitality which can additionally be utilized in various structures. Research is still in advancement on application cut sun oriented controlled vehicles; sunlight based fuelled steam turbines, and so on. A sunlight based electric bike, is a fundamental sort of car which can run both on sun oriented power and additionally power. With an unfortunate climb in the costs of petroleum and diesel, a car running on sun based power can make a pattern. This sort of a bike is easy to understand.

It is extremely easy to utilize and oversee. It comes at a reasonable expense and the per unit power utilization is less. It tends to be utilized notwithstanding amid the occasions when there is no daylight. Since, the sun's vitality caught by the sunlight based board can be proficiently changed over in electrical vitality and put away in a battery. The significance of these sorts of uses is step by step expanding with the reducing non-sustainable power sources like petroleum products and so forth.

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