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Electric Scoot

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Abstract: ***In today's world, the infrastructure of College and Industries are becoming large so if one has to travel or visit from one place to another he has to walk a long distance and sometimes it becomes very hasty and inconvenient. Sometimes after too many travelling on campus, it causes strain and pain in the body. So to travel these distances two-wheeled or three-wheeled electric scooter like Segway PT, Irrway were introduced .But, these scooters are very costly such as they start from ₹ 50,000. Another problem with that vehicle is that they are difficult to handle when we drive the first time. So in alternate to this product, we developed whole newly designed product and this is Reliable, Eco-friendly, a Compact vehicle for the campus. Its utilities are college campus, Airports, Industries, Recreational Parks, Sanctuaries, Museums, Palaces, Villas etc. So our project is on design and fabrication of three-wheel vehicle and also its multipurpose utility among the society. The concept of the model taken from children's scooter bicycle. The complete body looks like a scooter bicycle in which platform is provided for standing and driving the powered scooter. This product is a battery powered and motor-driven vehicle. The scooter is intended to use in indoors areas as well as in outdoor areas, due to the absence of any type of pollution causing drive mechanism such as petrol engines.***

I. INTRODUCTION

An electric scooter is a battery-operated one-person capacity vehicle which is specially designed for people with low mobility. It is generally used by those who have difficulty in walking for long periods of time. Scooters are available in three common designs, those intended for indoor use, those for outdoor use, and those that are used for both. An electric scooter may have three wheels or four. Since it runs on battery power, it does not create pollution. A typical electric scooter requires a pair of batteries, but the batteries are rechargeable. The length of time an electric scooter can run on each charge depends significantly on its battery's type, rating and capacity. The most common batteries are advertised to run for about eight hours, and between 20-30 miles, before needs to be charged. Some people are a little wary of purchasing an electric scooter because they fear it will be difficult to operate. In fact, the control console makes it quite simple once a person gets the feel for it. Electric scooters are also equipped with advanced brake systems, so stopping is simple and comfortable. The brake begins to engage as soon as the operator lets off the throttle, so there is little chance for abrupt or jarring stops. Most scooters also have a parking brake to keep the electric scooter from rolling when parked.

II. LITERATURE REVIEW

The project aims to underscore the importance of tapping alternative and clean energy sources to address various energy issues confronting the global environmental landscape. The major objective of the projects to design and fabricate an Electric two wheel Scoot. Project is primarily designed for green mobility thus it will also help to control the pollution which is one of the major crises nowadays. Increasing interest from large manufacturers and decreasing battery costs offer an opportunity to drastically change the current market landscape for electric motorcycles and electric scoot. With well-known players such as Yamaha and Harley Davidson poised to expand offerings into this space, and low battery costs making products more affordable, sales of these vehicles are expected to experience stable and continuous growth in the coming decade. According to a recent report from Navigant Research, sales of electric motorcycles and scoot are expected to total 55 million from 2015 to 2024. In the India recently three-wheel electric scoot, designed for short distance mobility, was introduced on an experimental basis at the Mysore palace and the zoo during the Dussehra season in 2016. The manufacturers are also in talks with the Tourism Department about introducing the scooter in different places of tourist interest across the State. After reviewing this we can finally say that wheel motor in electric scoot can be effectively used. And it also occupies less space compare to conventional drive and having less weight which is major advantages for this motor. Also dry battery is suitable for small utility vehicle as it has low maintenance cost and large current density. Which directly said that it can suitable with our two-wheel campus vehicle. After this whole reviewing process, we started working our next phase of proposed methodology.

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The companies like Segway & MI have launched their electrical models since last few years. Their concept was very authentic and reliable for using in campus especially for the employees of organization. But, their price was very hefty and it caused much capital Mechanical Projects: Learnmech.com14 to invest for the large scale amount and that was not affordable by the buyers and dealers. And thus it became major problem and drawback for the companies that they couldn't even reach the break-even point for their production and eventually they were in loss.



Fig. 1: Electric Scoot.

III. COMPONENT OF ELECTRIC SCOOT

A. *Battery*

1) Battery is the main fuel source for our vehicle that supplies energy for its functioning, the scooter been electric powered requires the supply of DC current source. We are use following battery.
2) Battery type:- dry battery 12V 9.0Ah. (use in ups system & LED inventer)
3) Charging time :- 15 V , 1 A
4) Minimum time 3 to 4 hr.

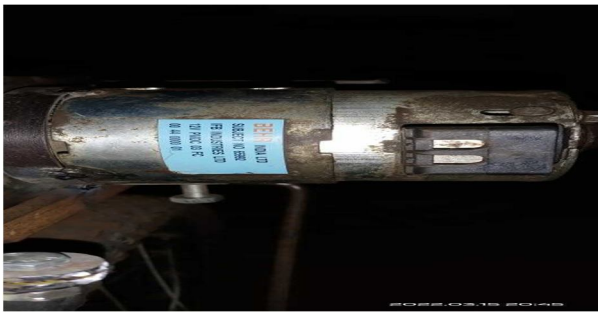


Fig. 2 :-Battery

B. *Motor*

Motors are the devices that convert the electrical energy into mechanical energy and causes the vehicle to propel. Basic working principle of DC motor is based on the fact that whenever a current carrying conductor is placed inside a magnetic field, there will be mechanical force experienced by that conductor.

1) It's motor use in car AC blower (indica)
2) Motor RPM is 3000 to 3600 depend upon V &A.
3) Torque of motor is 140nm.



. Fig 3 : Motor

C. Wheel

A wheel is a circular component that is made to rotate on an axle bearing. The wheel is one of the major components of the wheel and axle which is one of the six simple machines.Wheels along with the axles, allow heavy objects to be moved easily allowing movement or transportation while supporting a load or performing labor in machines.

Front & rear wheel radius is 7 inch. front & rear wheel width is 2 inch.

Center to center distance in 35.5 inch.



Fig 4: Wheel

D. Brakes

We are using shoe brakes in e scoot, its also known as bicycle brake pad or brake block Rubber asbestos. They rub against the wheel or disc to slow down or stop the e scoot.Brake shoes moulded power brake type made from high quality rubber & insulated steel plate. Brake pads can be made of leather, rubber or cork and are often mounted in metal "shoes". Rim brakes are typically actuated by a lever mounted on the handlebar.



Fig. 5: Brakes

IV. MATERIAL USED IN ELECTRIC SCOOT STRUCTURE

Material used in electric scoot is mild steel. Density is define as the mass per unit volume. The density of mild steel is 7860 kg/m^3. Mild steel is low carbon steel.

1) Physical properties of mild steel.
2) High tensile strength.
3) High impact strength.
4) Good ductility and weldability.
5) A magnetic metal due to its ferrite content .
6) Good malleability with cold forming possibilities.
7) Not suitable for heat treatment to improve properties.
8) Properties of rectangular MS steel pipes.
9) They have high tensile strength.
10) Owing to the presence of a high amount of iron and ferrite, they have magnetic properties

V. ADVANTAGES OF ELECTRIC SCOOT

Electric Scoot has following advantages:

1) It is Eco-Friendly.
2) It can easily be used for short-distance travels i.e. College tours, factory tours etc.
3) Skipping traffic jams.
4) Easy to find a parking space.
5) No air pollution.
6) Don't need a driver's license.
7) Low maintenance costs.

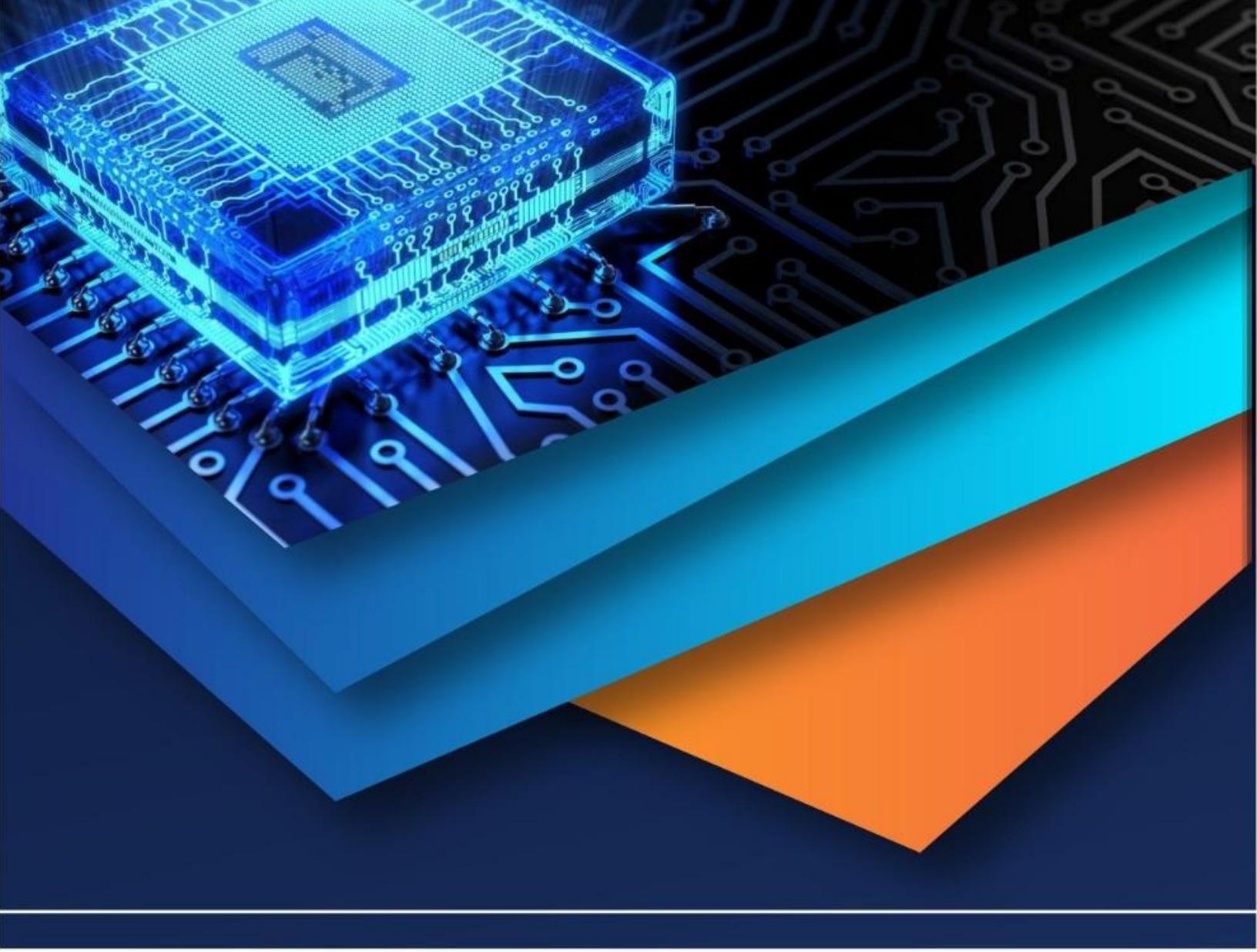
VI. CONCLUSION

The project deals with the design and fabrication of Electric Scooter that promotes economical and eco-friendly means of transport for everyone. As the initial step, a literature survey on related systems and projects were conducted. A suitable design was proposed but due to infeasibility incurred in making the model, we decided to make a scaled-down prototype changing the design accordingly. The design dimensions and aspects were successfully calculated and analyzed. Materials and components for the fabrication of the project were compared and selected. The vehicle is used to reduce the manual effort i.e. in place of conventional cycle; and gives more displacement with lesser effort. This scooter has only three wheels, looks robust and lets you take it for a ride according to its design. Many systems can be improved in the future to optimize the manufacturing of the vehicle. Solar panels and Dynamo generators can be incorporated with the vehicle for charging while driving. Light weight carbon fiber can be used to reduce the overall weight of the vehicle and improves strength. This system can be efficiently used anywhere whether it is outdoor or indoor. This utilizes highly fuel-saving technology which is a major requirement of this era. We developed a branch and bound approach which is coupled with quick, effective bounds to optimize the Electric Scooter which serves the purpose of travelling and also use the non- renewable energy resources. On the whole, we are satisfied with our project.

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