Design and Fabrication of Mini Hoverboard Kart

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Abstract: Our main project moto is to reduce pollution. Now-a-days all vehicles are equipped with electric motor with different variations. This project deals with design and fabrication of hover board kart which has high degree of freedom with normal vehicles and can be used as personal transporter in cold storage areas, hospitals, which can work effectively and requires less maintenance, long life with cheaper price compared to any other product in the market. This vehicle is equipped with two drive wheels to control the motion and a swivel wheel for balancing. The title of the project is “design and fabrication of mini hoverboard kart” it contains two parts design and fabrication. After the fabrication work is completed inspection is done by test driving. Mini hover board kart is easy to handle and easily rechargeable. This hoverboard kart is easy to transport from one place to another place.

Keywords: Hoverboard, Mini Kart, Electric Vehicle, Catia

1. Introduction

In India, two-wheeler and four-wheeler plays vital role in fulfilling personal transportation. They contribute nearly two-third of the vehicle population in India. Due to the harmful gases exhausted from the SI and CI engines electrical vehicles are developed to reduce the harmful gases.

Now-a-days electric vehicles are used for the personal transportation. Among these personal transport vehicles hoverboards are used mostly. Hoverboards, in fact are the cheapest means of transport available, provided the distance covered is within the scope of walking or cycling, say. Running under the electricity and makes it faster than walking, thought might be slower than riding a bike.

1. 1 Hoverboard

Hoverboard is sort of portable, rechargeable battery powered scooter. It basically consists of two-wheels which is arranged side-by-side, with two small platforms between which the wheels on which the rider stand Hoverboards are often called as Self-Balanced Scooter. These hoverboards are becoming trend now to travel for small distance. uses number of gyroscopes to track alignment of the platform in horizontal plane and gives the command to controller. If the rider leans forward the motor runs within the forward direction to regulate the alignment, similarly for backward therefore the platform. It drives its wheels forward and backward as needed to return its pitch to upright. It has electric motor powered by lithium-ion batteries charged from household current. It does not have any mechanical brakes.
1.2. History of Hoverboard

A Hoverboard could also be a fictional levitating board used for personal transportation, it had been described by author joseph. In 2019 a hoverboard may be a common term for a self-balancing scooter, though properly speaking such devices don't hover. True hoverboards are generally depicted as resembling a skate board without wheels.

Guinness world record recognizes the term hoverboard to include autonomously powered personal levitators. In May 2015, the Romania-born Canadian inventor Catalin Alexandru Duru set a Guinness record by travelling a distance of 275.9m at heights up to 5m.

![Figure 1. Hoverboard](image1.png)

2. Design of Mini Hoverboard Kart

2.1 Rough Sketches

Initially rough sketches were prepared and a model is finalized which is as shown in the fig.

![Figure 2. Rough Sketches of Hoverboard Kart](image2.png)
Dimensions:
Height: 950mm
Width: 560mm
Length: 1150mm
Wheel base: 620mm
Ground clearance: 150mm
Front: 152mm
Rear: 200mm

2.2 Specifications of Hoverboard

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
<th>Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Function</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max Speed</td>
<td>12 KM/H</td>
<td></td>
</tr>
<tr>
<td>Range</td>
<td>8-10KM</td>
<td></td>
</tr>
<tr>
<td>Battery</td>
<td>24V/4AH/100.8WH</td>
<td></td>
</tr>
<tr>
<td>Gradient</td>
<td>About 15 degrees</td>
<td></td>
</tr>
<tr>
<td>Working Temperature</td>
<td>-20-60 degree</td>
<td></td>
</tr>
<tr>
<td>Max Load</td>
<td>100KGS</td>
<td></td>
</tr>
<tr>
<td>Charging Voltage</td>
<td>AC 100-240V/50-60Hz</td>
<td></td>
</tr>
<tr>
<td>Charging Time</td>
<td>120-180 min</td>
<td></td>
</tr>
<tr>
<td><strong>Appearance &amp; Weight</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size</td>
<td>584<em>178</em>186mm</td>
<td></td>
</tr>
<tr>
<td>Pedal Distance</td>
<td>110mm</td>
<td></td>
</tr>
<tr>
<td>Chassis Distance</td>
<td>30mm</td>
<td></td>
</tr>
<tr>
<td>Net Weight</td>
<td>10KGS</td>
<td></td>
</tr>
<tr>
<td><strong>Protective Measure</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety Speed</td>
<td>Starts on speed of over</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10km/hr</td>
<td></td>
</tr>
</tbody>
</table>

Table 1. Specifications of Hoverboard
3. Cad Designs

Figure 3. Left Side View

Figure 4. Front View

Figure 5. Top View
6. Result and Discussion

It is a beneficiary to go for electrical energy than any other renewable energy sources. Mini hoverboard kart is the portable transmission system. The project can be more efficient than any other E-vehicles compared to other vehicles less maintenance & low cost to other vehicles of portable transmission. The fabrication of hoverboard kart is made simple & will give more efficiency pickup, speed, torque, etc. The vehicle can be used both indoor & outdoor. Mini hoverboard kart is used to transport people from one place to another. Finally, the project mini hoverboard kart was prepared as per the CAD design.
7. Acknowledgment

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