Hoverboard

Prof.Amol Parihar[1], Mr.Abhishek Gupta[2], Mr.Shrikar Shengule[3], Mr.Sagar Patil[4],Mr.Kashinath Sable[5], Mr.Dhanjay Borde[6]
[1, 2, 3, 4, 5, 6] Dept of Mechanical Engineering
[1, 2, 3, 4, 5, 6] MGM's Polytechnic Aurangabad

Abstract- *The project aim of hoverboard to reduce pollution from cars and gasoline and make transportation more fun. We plan to do this by making all new means of travel. The hoverboard will reduce the amount of cars sold and the amount of gasoline used and put into the air. So we planned to make hover board cart. Hoverboard which runs using the power of motors which are connected to each wheel of the hover board. Motors are getting power from the battery used in the hover board. An Electric DC motor is a machine which converts electric energy into mechanical energy. The working of DC motor is based on the principle that when a current-carrying conductor is placed in a magnetic field, it experiences a mechanical force. The Electric motors give the necessary torque to the wheels and then it is controlled with the help of switches. As the whole idea of hover board cart is based on the people related to disabilities, the switches used at the hand positions so that anyone can able to navigate the vehicle easily*

Keywords- Hover board, Motor, Bearing, Design etc.

I. INTRODUCTION

Hover boards or self-balancing scooters is a personalized transport. It consists of two motorized wheels that are connected to a pair of articulated pads on which the rider places their feet. In fact, the rider can control the speed of the hover board by leaning forward or backward and change the direction by twisting the pads. Hover boards or Self Balancing Scooters had invented in the year 2013.However, after its invention, the device has become a subject issue for the patent rights. More, the manufacturing had started in China. In the year 2014, early units caught fire because of overheating the battery. Along with that in 2016, companies of China and USA producing Hover boards have to recall their 50,000 products.

1.1 Invention –

59-year-old Shane Chan has invented the hoverboard. He grew in China, and then went to USA in 1986. Now, based in Washington before setting up his own business of hoverboards, he worked as an scientific instrument designer until 2011. However, he began his new career in hoverboards. In the early innings of his career, he has designed Hovertrax. Now, he is working on his versions of hoverboards. In fact, his inventions have commercialized by other companies. Further, you can see that improved and copied versions of hoverboards available in the market. In the couple of years, we can see hoverboards are flooding in the market. Celebrities post their pictures with their hoverboards on the social media platform.

1.2 Aim-

- To reduce the pollution
- To use for the personal transport

1.3 Objectives-

- Hover board India mainly aims to ensure customer safety and satisfaction. We even have some main objectives to satisfy our customers.
- Supply: Hover board India is one of the topnotch company that which supply self-balancing scooter with standard quality at your doorstep. Due to higher awareness regarding hoverboard, the demand is flown high. So, Hover board India is supplying more to meet the demand for an afford able price.
- Customize: Most of the products that we offer can be modified as per customer specifications .Hoverboards India permits customers to modify the boards in the medium of Speakers and LEDs.
- We, hoverboard are in the continuous process to supply the best standard hover boards to our customers.

II. WORKING PRINCIPLE

- Self-balancing boards have frames that pivot in the center. The electric motors and sensors that detect speed and tilt angle are actually inside of each wheel.

- The gyroscopes receive the data from the tilt sensors in the wheels and relay it to the logic board, keeping the board upright at all times.
- There are switches under each foot pad that trigger an infrared LED light, which triggers a sensor.
- The light remains on when the rider keeps their feet flat, letting the logic board know not to run the motors.
- When the rider leans forward, the switch turns off the LED light, then the sensor lets the logic board know to spin those wheels.
- Since the motors are independent of one another, a rider can actually do circles in place.

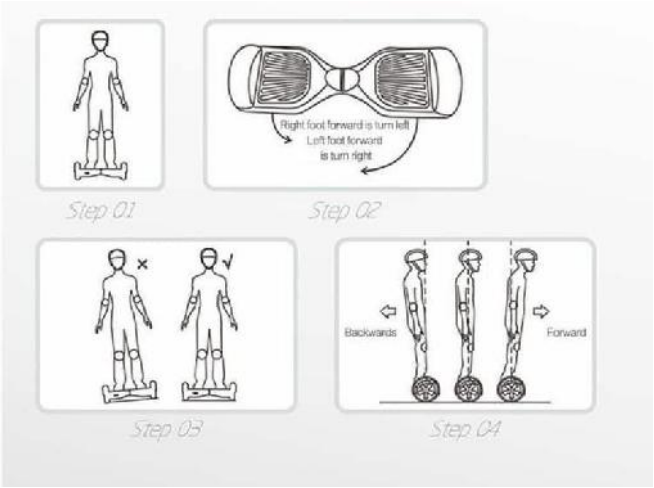


Fig. Riding of Hoverboard

III. LITERATURE SURVEY

In 2013, first Hoverboard or self-balancing scooters had founded by American businessperson Shane Chan. In May 2013, he had launched kick-starter fund raising campaign. Chinese company Chi Robotics had to know about the hoverboard by a weird article “Smart S1” suggested by David Pierce. Earlier Hoverboard called Hover trax. Chic Robotics, Chinese company released its first Hoverboard “Smart S1” in August 2014 in Canton Fair Trade Show. In short period of time, this device got huge popularity in the western countries. Initially, many popular celebs like Justin Bieber, Jamie Foxx, Chris Brown, and Kendall Jenner endorsed Hoverboard (Self-balancing scooters). By 2015, Shenzhen region of China had become the place of manufacturing Hoverboards. Apart from that popularity of the Hoverboards, there were several issues raised in China by Chen regarding the patent rights in China. After that, Mark Cuben had announced to take the Hoverboards patents from Chen. It was because of the defects in the products manufactured by the Chen Company. However, the issues were constantly rising. Again, in 2016, US International Trade Commission had issued patent infringement against UPTECH, U.P Technology, U.P Robotics, Free Go China and Eco Boomer but settled with segway.

IV. CHARACTERISTICS

1. Size:- This is the overall size of the Hoverboard. In fact, you do not a Hoverboard that is too narrowor wide. The best Hover board or self-balancing scooter for you is that on which you stand in a natural position. More, you find it comfortable to ride the Hoverboard or self-balancing scooter.

2. Weight:- Hoverboard or self-balancing scooters vary in weight according to the battery type and material used in them. It is important to get the Hoverboard that is light in weight. While buying the overboard or self-balancing scooter one thing you should keep in mind that it is easy to carry and ride. Moreover R2D weighs only 22lbs costs around$599 on Amazon

3. Speed:- Generally, the speed of the Hoverboard is around 5-10 MPH. However, this can surprise you,that there is a huge difference between in single mile per hour and that takes you to the different riding experience .It is important to include speed as an important in buying and ridings Hoverboard. Faster the Hoverboard means more fun and excitement. Robot Turbots Hoverboard excels in its speed, hits around 15MPH in just 6seconds. More, you can get this Hoverboard from Amazon ataround$549.

4.Climbing angle:-The climbing angle of the Hoverboard is measure in degrees.In fact, the steepness of an incline of the Hoverboard, the rider can climb easily without losing power. You should know that how steep Hoverboard you can climb easily so that you do not find it difficult while riding.

5.Battery life:- You should know that how long the battery of the Hoverboard lasts when it is fully charged. The Hoverboard or the self-balancing scooter should be best with its battery. Therefore, the rider does not find difficulty to find charge points for charging. It can long distance on a single charge. Robot Turbots Hoverboard comes has the best battery life, you can travel 16 miles on a single charge.

6.**Max rider weight** Here you can get to know about the maximum weight of the rider using the Hoverboard orself-balancing scooter. Generally, the durability of the Hoverboard depends on its capacity to carry weight.

V. METHODOLOGY

In designing and fabricating this hoverboard ,a flow of methods had to be used. First of all, a process planning had to be charted out. This acts as a guideline to be followed so that, the final model meets the requirement and time could be managed. This would determine the efficiency of the project to be done. Regulating and analyzing these steps are very important as each of it has its own criteria to be followed.

Flow Chart

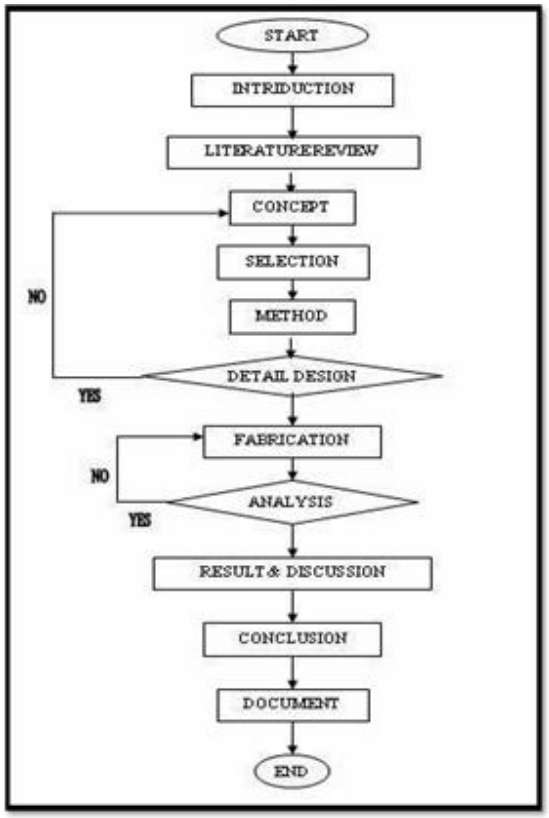


Figure. Flow chart diagram

The flow chart starts with the introduction. Here, the introduction is first plan to start the project. The supervisor request for understanding of the project and make some research about the project title. Student makes project synopsis, objective, and scope of work, problem statement and planning.

Once the introduction is done, the supervisor request for the understanding of theproject. Thus, literature review on the title is done thoroughly covering all the aspect of the project.The medium for this research is via internet and books. Essential information related to the projectis gathered for referencing. In concept ualization,f ew design sared one using the sketching which is then saved to be reviewed. Sketch four concepts suitable for the project with a 3-dimensional and understanding. The sketching is first step for designer used of the time. After four designs sketched design considerations have been made and one design have been chosen. The selected design sketched is then transfer to solid modeling and drawing using solid work application. Software issued because it gives a better dimension of air bike compared to manual draw and is much easier touse.

However, the drawing using software is just guideline to be followed to improve the Mechanical sickle after draw is done, the project proceeds to next step that is fabrication process. The finished drawing and sketching is used as a reference by following the measurement and the type of material needed. The fabrication process that involved is cutting, welding, drilling, ant theater every process was finish, the parts are check to make sure that the output of the process obeys the product requirement.

If all the parts had been processed, the parts are joined together to make here come the analysis processes. During the testing, if problem occurs aches fan doesn't work insufficient, bike will step back for fixing of the problem. Their bike frame is finished by doing some finishing process such as grinding and spraying. A fetal parts had been joined to gether and analysis, the last phase of process that is result and discussion. Inresult and discussion, the draf treport and the en tirerelated article are gathered and hand over to the superv is or for error checking.For the conclusion, the finish product will be compare with the report to make sure that there is no mistake on both project and report. After the product and report had been approve by the supervisor, there portisrearran ge and print outto submitat supervisor, the project coordinator and faculty of Mechanical Engineering. IN this stage, the final presentation was also being Prepared and waited to be present.

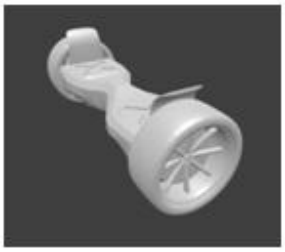
VI. COMPUTER AIDED DESIGN DRAWING

After a design has been selected, the next step in designing process is dimension The design is separated into part by part and the dimension in g process is firstly sketche donthe paper. The dimensioning is based on relevant dimensions and also referring the existence ofHoverboard so that the design is fit into other part. After dimensioning, the drawing of the design is drawn using Cero Software 4.0; at this stage solid modeling method is used. Part by part solid modeling create according to the dimension done before, after all part create, the 3d model is assemble with each other base on the design.

Drawing

1.sketching - All the ideas for the Hoverboard fabrication are sketched on the paper to ensure that ideas selection can be made after the selected design choose.

2.Creo software 4.0- The design and concept sketch is transfer to solid modeling and drawing using creo software.



VII. COMPONENTS

7.1 Gyroscope-

Hoverboards are built in such a way that each of the wheels has its own Gyroscope, Tilt and speed sensor. They are generally placed below the frame where rider places the feet. Once the rider places the feet on the board, Gyroscope provides data to the logic board when the rider tilts ahead or backward

7.2 Motor

A DC motor is any motor within a class of electrical machines whereby direct current electrical power is converted into mechanical power. Most often, this type of motor relies on forces that magnetic fields produce A 12v DC motor is small and inexpensive, yet powerful enough to be used for many applications.

7.3 Battery

A lithium-ion battery or Li-ion battery is a type of rechargeable battery. Lithium-ion batteries are commonly used for portable electronics and electric vehicles and are growing in popularity for military and aerospace applications

7.4 Wheel -

Self-balancing boards have frames that pivot in the center. The electric motors and sensors that detect speed and tilt angle are actually inside of each wheel. The gyroscopes receive the data from the tilt sensors in the wheels and relay it to the logic board, keeping the board upright at all times.

7.5 Wooden plywood:

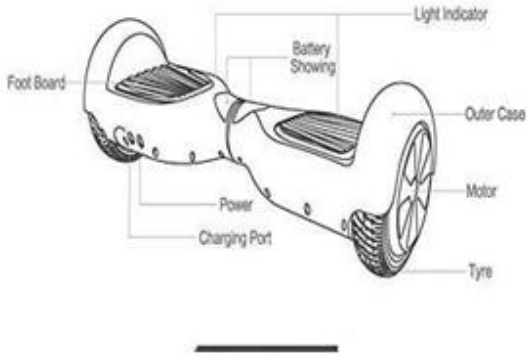
Take the sheets of wooden ply, Convert this ply into the size of 45cm x 20cm with the help of Hacksaw Cutter. Note that wooden ply must be Light in Weight and carry rider weight without Breaking.

VIII. SPECIFICATION AND FEATURES

SPECIFICATION :-

Type: Two Wheels.
Frame Material: Wood

Range per Power: 10 - 30 km.
Power Supply: Lithium Battery.
Voltage of Battery: 36v.
Max Speed: <30km/h
Motor: 12 volt.



FEATURES:-

- Self-balancing Technology.
- Exclusive technology & sensors ensures the smoothest ride.
- No Chinese Batteries! Safe UL2272 Li-Ion batteries that won't overheat or catch fire!
- Ride Further & Faster.
- Cruise at speeds up to 10 MPH and 8-12 Miles on a single charge.

IX. ADVANTAGES

- Medical Benefits and Security Beef Up
- Cost Effective, Eco friendly, and Safer
- Comfortable to Ride
- A Non-conventional way of keeping the Body Sound
- It Helps Your Posture
- It Enhances Reflexes

X. APPLICATION

- Increased Mobility in Daily Life.
- Get Around Fastest Work.
- Zip Around Campus.
- For Short Urban Commutes.
- Use as a Portable Stool or Table.
- Ride as a Go-kart

XI. CONCLUSION

Most of the fractures associated with hoverboard use are com-manly seen in everyday pediatric radiology practice, with an overall pattern paralleling that reported in association with skateboard use. However, an otherwise uncommon fracture, the distal phalanx juxta-epiphyseal fracture, was identified in association with hoverboard use, and this finding has important treatment implications including need for irrigation and debridement, antibiotic therapy and potential surgical fixation.

XII. APPENDIX

XIII. ACKNOWLEDGEMENT

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