

Working model of self-balancing vehicle with garbage collector machine

Sachin Gohil¹, Bhargav Kanthariya², Akshay Gohil³, Manav Goti⁴, Prof. Hiral Chauhan⁵

¹Department of Mechanical Engineering

Shree Swami Atmanand Saraswati Institute of Technology, Surat, Gujarat, India

Abstract: This paper consists of design and development of self-balancing vehicle and a garbage collecting robot. The self-balancing vehicle contains a sitting frame and hover board, two wheels arranged on the rear sides of the sitting frame. Direction control rod is arranged on the sitting frame which is attached on hover board. The cleaning robot is attached behind the self-balancing vehicle. Due to the difficulties faced in keeping the world clean manually, we have come up with the idea to collect the garbage. In which garbage is collected through conveyor belt mechanism which is stored in trash box. This conveyor belt mechanism is operated by electric motor. With this equipment which not only collects the solid waste (plastic bottles, cans, plastic bags etc.) but also separates it and store it in trash box.

Keywords: Hover board, sitting frame, Self-balancing vehicle, cleaning robot

1. INTRODUCTION

The Segway also called self-balancing vehicle was first introduced in the world in the year 2001 by dean Kamen. It is a two-wheeled device which is operated on electric battery. It maintains its own balance and that of its passenger. Segway is driven by standing on it and handle according to human body dynamics: lean forward to move in forward direction, stand straight up to stop it and lean backward to move in reverse direction. This paper describes the use of Segway as transportation device by attaching sitting frame to make it more comfortable for transportation.

Disposal of waste is a major problem in the world. Due to increase in population especially disposal of plastic which is biggest threat to environment is very difficult task. Due to the above difficulties faced in keeping the world clean manually, we have come up with equipment which can collect the solid garbage like plastic bottle,

cans, plastic bags, etc. this garbage collecting mechanism is going to attach with sitting frame. So, this model can be used for both transportation and cleaning purpose.

2. LITERATURE REVIEW

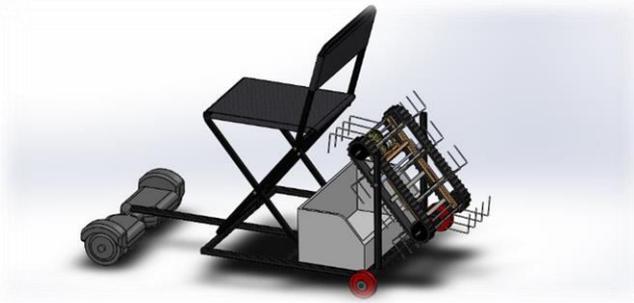
1. To develop a self-balancing scooter capable of transporting a single passenger motivation from a Segway Personal Transporter
2. Design and Development of a Self-Balancing Mono Wheel Electric Vehicle
3. Design & development of Segway
4. Design and fabrication of garbage collector on the beach using solar power
5. To design a modular robot which can be used as a beach cleaner

3. WORKING

Our project consists of self-balancing vehicle and cleaning machine. Self-balancing vehicle contain hover board and sitting frame. Hover board is main power source which drives the sitting frame and cleaning machine. When we move the hover board the sitting frame and cleaning machine also move in the same direction.

Cleaning machine contain conveyor and it is operated by electric motor. When the machine is switched on, the power from the battery reaches the motor. When motor receive power, it rotates the conveyor and lifters which are mounted on conveyor. When the lifters are rotate with conveyor it will lift garbage. This garbage is stored in the trash box.

4. DESIGN DIAGRAM



5. APPLICATION

1. It increases mobility in daily life.
2. Quickly move around the large work place.
3. Travel around the large campus, park, zoo, mall, etc.
4. Easily collect and store the solid garbage like plastic bottles, cans, plastic bags, etc.

6. FUTURE WORK

1. Increase the battery capacity of hover board so that it can operate for longer time duration.
2. Improve the garbage collecting machine so that it can pick up all type of garbage.
3. Provide additional features like battery backup, charging point, etc.

7. REFERENCES

- [1] Felipe schmoeller da Roza, Patrick jose Pereira , “To evelop a modular mobile robot platform for multiple purposes and its adaptation into a beach cleaner setup”. Volume 4, Issue 8, August-2015.
- [2] Arun, naga sankar, amratha lingam, Bharath Kumar, janrthanan, “Design and fabrication of garbage collector on the beach using solar power.” Volume 7, 2018.
- [3] Vivek Dhole, Omkar Doke, Ajitkumar Kakade, Shrishail Teradale, Prof. Rohit Patil, “To minimize the problem of wastage in river, lake, sea due to the plastic, electronic items, thermocol, metal etc.” Volume: 06 Issue: 04 . Apr 2019.
- [4] Prakobkarn, K., B. Saitthiti, S. Intaravichai, “ Design and Contruction of Beach Cleaning

Trailer by Finite Element Method. INT TRANS J ENG MANAG SCI TECH,” Vol. 3(2), February 2012.

- [5] Ching-Chih Tsai, Hsu-Chih Huang and Shui-Chun Lin, “AdaptiveNeural Network Control of a Self-Balancing Two-Wheeled Scooter,” IEEE transactions on industrial electronics, vol. 57, no. 4, april 2010.
- [6] Karthik, Ashraf, Asif Mustafa Baig And Akshay Rao, “Self Balancing Personal Transpoter” 4th Student Conference on Research and Development, pp. 180-183, June.2006.
- [7] Toh Boon Heng Elvin, “To develop a self-balancing scooter capable of transporting a single passenger motivation from a Segway Personal Transporter.” C157, 8 may 2007.
- [8] A.Geetha, Vishwanath Kannan, Akhil Sai Vontimitta, Indra Neel Patha , “Design and Development of a Self-Balancing Mono Wheel Electric Vehicle.”, Vol. 6, Issue 5, May 2017