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Working Model of Garbage Collector and Load Transporting Carting Hoverboard Vehicle

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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, Carting, sitting frame, Cleaning machine

I. 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, canes, 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.

II. LITERATURE REVIEW

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

III. WORKING

Our project consists of self-balancing vehicle and cleaning machine. Self-balancing vehicle contain hover board and sitting frame. Hoverboard is the main power generating element which produces power for the motion of the model Speed and movement of the model depends upon the lean position of operator's leg on hoverboard. Sitting arrangement and load carrying cart is attached with the hoverboard with the link so it also move in 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. As any garbage comes in a contact with a spikes attached on the conveyor of the garbage collector, Due to the motion of conveyor,garbage pieces get lifted in the bucket type construction of the conveyor which then transport lifted garbage to the very end of the conveyor and then garbage automatically fall into the trash box which is positioned under the conveyor mechanism due to the gravity. After then this empty buckets of the conveyor again travel in a loop such that as they reach at the ground level it has again space to pick next garbage come in a way and this process of collecting garbage and putting it to the trash box is the main working way of this garbage collector.

IV. ACTUAL MODEL



Fig. 1 Actual model of garbage collector and load transporting carting hoverboard vehical

V. APPLICATION

- A. It increases mobility in daily life.
- B. Quickly move around the large work place.
- C. Travel around the large campus, park, zoo, mall, etc.
- D. Easily collect and store the solid garbage like plastic bottles, cans, plastic bags, etc.
- E. Simple and comfortable transportation system for old and middle aged people.

VI. CONCLUSIONS

From the past experiments on the manual cleaning machines and self-balancing system, we can now combine those 2 technologies for our current era. The benefits of both system can be utilized to solve our current garbage problems. We can take advantage of self balancing vehicle to not only in transportation but add automatic cleaner device to it and use it in another purpose also. This system does not need more human efforts. If the reduction in pollution and cost is made by everyone, it can bring a big positive overhaul.

VII. ACKNOWLEDGMENT

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REFERENCES

- [1] https://www.researchgate.net/publication/326294136_Development_of_Self_Balancing_Robot
- [2] https://www.researchgate.net/publication/329415693_Scuba_-_Concept_and_Implementation_of_a_Self-balancing_Autonomous_Mobility_Device_for_Personal_Transport
- [3] <https://link.springer.com/article/10.1186/s13640-019-0434-7>
- [4] https://www.researchgate.net/publication/325600831_Design_and_Fabrication_of_Multipurpose_Eco-Friendly_Cleaning_Machine
- [5] <https://www.omicsonline.org/open-access/design-and-theory-for-creating-hover-board-2277-1891-1000162.php?aid=80975>
- [6] <https://journals.physiology.org/doi/full/10.1152/jn.00199.2018>
- [7] <https://www.ijedr.org/papers/IJEDR1810042.pdf>



- [8] Ching-Chih Tsai, Hsu-Chih Huang and ShuiChun Lin, "Adaptive Neural Network Control of a Self-Balancing Two-Wheeled Scooter," IEEE transactions on industrial electronics, vol. 57, no. 4, april 2010.
- [9] 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.
- [10] 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
- [11] Leone C., Lopresto V., Iorio I., (2009)" Wood engraving by Q-switched diode-pumped frequency-doubled Nd:YAG green laser." Department of Materials and Production Engineering. University of Naples Federico II, P.le Tecchio 80-80125 Naples, Italy. Vol. 47, Issue 1, p.161-168.
- [12] . Deshmukh B., Pardehi S. and Mishra P. (2012), "Conceptual Design of a Compliant Pantograph International." Journal of Emerging Technology and Advanced Engineering, Vol. 2, Issue 8, p.2250-2455
- [13] Karthik, Ashraf, Asif Mustafa Baig And Akshay Rao, "Self Balancing Personal Transpoter" 4th Student Conference on Research and Development, pp. 180-183, June.2006



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