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Research Paper

PERSONAL AIDED AUTO EQUILIBRIUM TRANSPORTER

C Sivapragash^{1*}, N Kamalamoorthy¹, B Arthi¹, B Saranya¹, B Sharmila¹ and S Shivaranjani¹

*Corresponding Author: **C Sivapragash** ✉ sivadr2002@gmail.com

Segway is a personal transporter. The present model of segway costs high and hence not used by many people. The reason for high cost is the use of hub motor and lithium ion battery. In this paper, we propose an idea to overcome the above difficulties by making a cost-effective and modified segway. We surmount the demerits of segway and introduce a modified transporter called Personal Aided Auto Equilibrium Transporter(PAAET). For this modified design we use brushed DC motor and lead acid battery and is provided with electric braking. This PAAET is used in case of transportation inside an office or an industry or in any tourist place by using battery with low power consumption It can be driven in reverse also. The battery can be charged in two modes, i.e, by fixing a solar panel to the vehicle and mechanically by rotation of motor. The design of PAAET will give a perfect mode of transportation within a short range.

Keywords: Cost-effective, Brushed dc motor, Lead acid battery, Solar panel, Indoor transportation

INTRODUCTION

At present scenario, vehicles are the heartbeat of transportation. A wide range of transporters and methods are known for transporting human subjects.

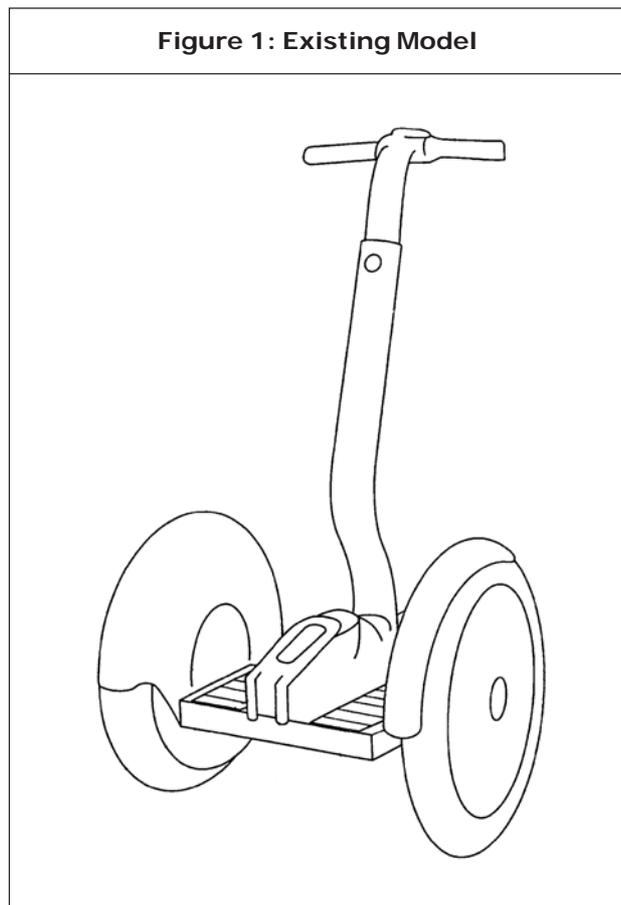
Typically, such transporters rely upon static stability and are designed for stability under all foreseen conditions of placement of their ground-contacting members with an underlying surface. For example, a gravity vector acting on the center of gravity of an automobile passes between the points of ground contact of the automobile's wheels and the suspension of the automobile keeps all wheels on the ground at all times making

the automobile stable. Although, there are conditions which cause otherwise stable transporters to become unstable. In India Segway was introduced in 2010 and was sold around 250 units till 2014. They are introduced at Ambience complexes in south Delhi and Gurgaon, the Indira Gandhi International Airport in Delhi, at many golf courses and to promote tourism at places like Kankaria Lake, Ahmedabad. To overcome this and for the purpose of indoor transportation like moving inside a industry campus or companies or hospitals, etc, we introduce a new form transportation which is Personal Aided Auto Equilibrium Transporter (PAAET). It is an amazing engineering marvel. The PAAET is a two-wheeled,

self-balancing, battery-powered electric vehicle. It is a personal transport device that satisfies the above needs. They are also used in some theme parks by visitors and employees.

EXISTING SYSTEM

The present model of segway works on the principle of inverted pendulum. It uses an advanced microprocessor control system. This microprocessor “brain” of the Segway takes information from gyroscopic sensors which tells the onboard computer how much the Segway is leaning. The motor used to drive the wheel is hub motor. Lithium ion battery is used as battery source in traditional model of segway. There is no braking system in this transporter. It runs at a speed of 20.1 km/hr. The Fig 1. Shows the existing model of segway.



REVIEW OF PROBLEMS

The vehicle is expensive, which costs from Rs.1.85 lakhs - 3 lakhs.

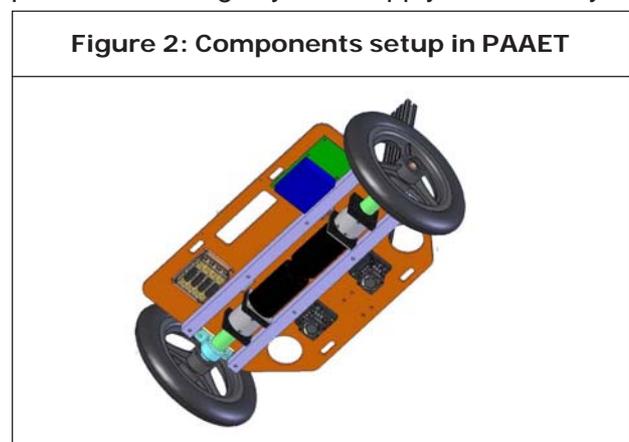
- The cost of hub motor is very high. They are not proficient as non hub motors.
- Changing a flat tyre in hub motor is a tedious process.
- The lithium ion battery, used as battery source is expensive.
- There is no braking system in this model.

PROPOSED IDEA

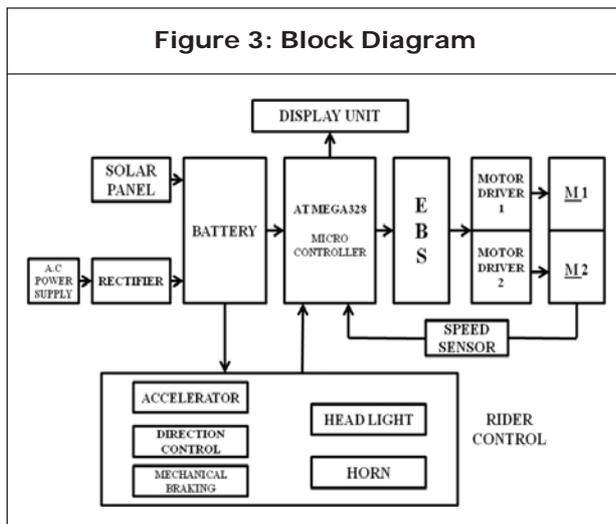
In this paper we propose an idea to use brushed dc motor which is efficient and also low in cost when compared to hub motors which are used in existing system. The power output of brushed dc motor is 250W and it has a torque of 500mNm. The lead acid battery is used as battery source. It is inexpensive and easy to place. The segway uses gyroscopic sensors to turn or tilt. But in this model we turn our PAAET by controlling the motor with switch. We use electrical braking system in PAAET. The segway runs at a speed of 25 km/hr. We use headlight which is useful to travel at night times.

WORKING PRINCIPLE

PAAET works on the principle of inverted pendulum as segway. The supply from battery is



given to the controller which controls the motor driver circuit. The controller is used to control the speed of the motor. The variable power supply varies the supply to control the speed of the motor. The motor driver circuit comprises the H-Bridge converter. In the existing system segway is tilted or turned by using gyroscopic sensor. In proposed idea we use keypad to control the direction of the motor.



CONCLUSION

PAAET scooter tends to be faster and require less effort than walking. In many situations they allow non-drivers to travel several times farther than is possible with just walking. It can therefore increase transport system efficiency by providing mobility to non-drivers and substituting for automobile travel. It is sealed against wet conditions. It is cost-effective which adds to the advantage. PAAET can be used in airport staff transport, warehouse mobility, golf course mobility, and tour guidance. It can be used for transportation inside hospitals also. Police patrolling is easier using this transporter. Helps to travel throughout large bases and vast facilities quickly. Allows the riders to easily travel indoors, outdoors, through doorways and into elevators. It can be used in pavement. It can

also be used by old people to travel in tourist places, parks, etc.

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Hyderabad, INDIA. Ph: +91-09441351700, 09059645577

E-mail: editorijerst@gmail.com or editor@ijerst.com

Website: www.ijerst.com

