

Segway

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ABSTRACT

The segway is the transportation product to stand, balance, and move. It is a low-speed transportation device. The segway has been built a part of applied control and electrical and mechanical fusion. This kind of vehicle is interesting because it contains a lot of technology relevant to an eco-friendly and energy-efficient transportation industry. In this vehicle, regenerative braking is used. The main objective to build this vehicle is that it is capable of transporting a person weighing up to 70-80 kg and capable of traveling to 8 km distance with constant speed. This vehicle can operate controller mode and transport mode. This vehicle turns right-left and forward-backward movement when the driver operating relay switch in transporter mode to stabilize the body. In this work segway as well as manually balancing electric vehicle is prepared

Keyword: - DC Motor, Battery, Iron Chassis, Wheel, Stability, etc

1. INTRODUCTION

The segway is an essential part of transportation and also we can say that this is an important part of daily needs. There is various ongoing innovation in transportation field and they consider as the gyroscope is used in everywhere from balancing means there is a vast use of gyroscope so, in this self-balancing three-wheel transportation we can understand the mechanism of the segway in which the third wheel is used for the balancing. So which is self-balancing and how we can make our transporter safe than ever by using the third wheel apart from that the cars become electric, safe and smart but they are too expensive. Not affordable but on the other hand the three-wheeler is the most influential and cheap way of transportation. The suction for making this transporter in which can balance itself using the third wheel so that rider does not have to worry about falling.[8]. This vehicle is construct and design to carry the load with human weight and also its design and construct without using a sensor.[6].it uses a rechargeable battery which converts the electrical energy into mechanical energy and which can be charged by the power connection. The advantage of this vehicle is that does not have release any emission. This is one of the low-speed transportation that can be used for a small distance which carries maximum weight up to 70-80 kg. the construction of this vehicle is to reduce the problem of lack of stability, affordable vehicles, and minimum cost.

2. BASIC STRUCTURE

In this structure shown in fig 2.1, the segway we will use two wheels, two motors, and battery for supplying the power to the battery charger is used and for controlling the motor the controller is used. The two-wheel is connected with a motor with the help of shaft and the third wheel is used for balancing vehicles. The power supply is passed to the battery with the help of a charger. In the battery, electrical energy converts into mechanical energy, and this mechanical energy is needed to drive the motor and run the motor.

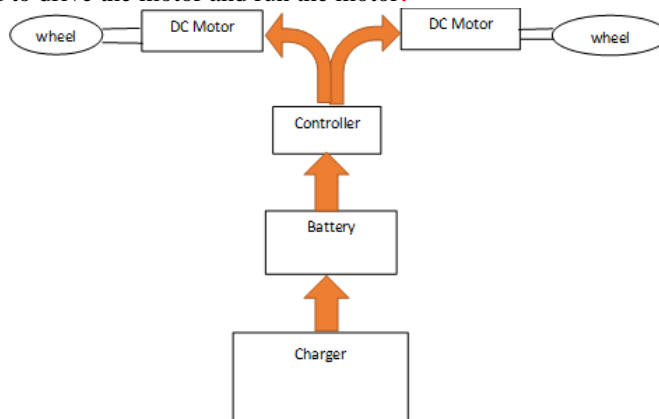


Fig 2. Block diagram

Components used to fabricate segway are as follows

1. Arduino board
2. Dc motor.
3. Battery
4. Handlebar
5. Chassis

3. RELAY OPERATED CONTROLLING

3.1 Skid steering mechanism

The steering mechanism of the vehicle is based on the differential drive as shown in fig 3.1. In this vehicle, it has two independently controlled drive motor and also controlled the speed of two wheels independently. This speed difference makes the vehicle to skid and turn.

The vehicle turns right when the speed of the left wheel is more than the right wheel and the vehicle turn left when the speed of the right wheel is more than the left wheel. When both the wheel rotating in the opposite direction, the vehicle turns about its axis. This property is known as a zero-turn radius. The third wheel just turns in the direction given by the two drive wheels and does not disturb the regular motion of the vehicle.

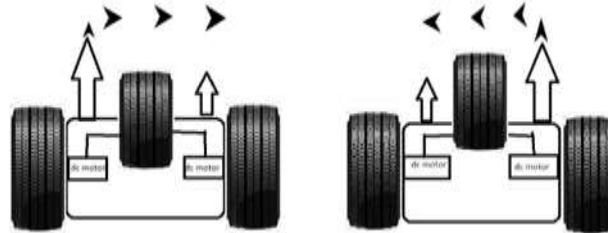


Fig-3. skid steering mechanism

This skid steering mechanism we can control by microcontroller atmega16 which consists of four relays in such a way that motor can spin at full power. By the switches, we can control the motor or rotate the motors in a clockwise and anticlockwise direction. This all-action can be done by a battery which rating is 12V 7Ah.

4. REGENERATIVE BRAKING

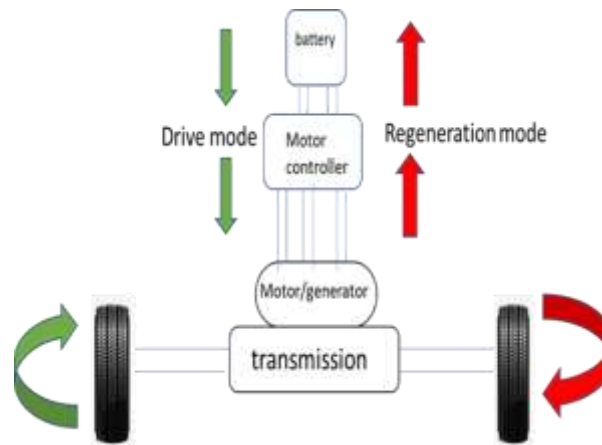


Fig. 4. Regenerative braking.

Regenerative braking is an energy recovery mechanism that slows down moving vehicles or objects by converts its kinetic energy into a form that can be either used immediately or stored until needed. this braking is carried out on two parallel motors and it is preferable identical ones without wasting their output. The two motors are coupled mechanically and adjusted electrically. That is used as a motor and generator. The mechanical output of the motor drives the generator and the electrical output of the generator is used in supplying the greater part of the input to the motor.[13]. If in this motor there are no losses then without any external supply the motor would have run. If we have to stop the motor then it is necessary to interchange the connection of the motor then the motor acts as a generator then generating energy can store in the battery.

5. CONCLUSIONS

This design and fabrication of the project on segway are aimed to provide a zero pollution environment within the campus and cut short on the cost of the actual segway. this also provides a solution for making the segway fail-proof from falling. The conclusion is to develop a lightweight vehicle and fail-proof from falling and last but not least its cost is very less than conventional stand-up transporter namely segway. In this vehicle we use regenerative braking therefore is very much energy efficient.

6. REFERENCES

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