

Automated Travelling Bag

Yogendra C. Sapkale¹, Pravin S. Rote², Pranali N. Lahire³, Rushikesh S. Jangam⁴, Mayur C. Parmale⁵

^{1,2,3,4}BE, Student, Dept. of Electrical Engg, MET BKC IOE, Nashik, Maharashtra, India

⁵Assistant Professor, Dept. of Electrical Engg, MET BKC IOE, Nashik, Maharashtra, India

Abstract: - In today's modern era, by doing market survey it is observed that everyone wants modern lifestyle by giving less input and efforts. Since carrying of heavy loaded bag manually is not feasible for everyone. Thus driving of bag automatically makes a smart move. However as far as bag performance is concerned, the same technology can be used for industrial application where the requirement of automation is on prior basis which further improves technical standard of industry. By drawing customer (owner of bag) reviews the bag is cost effective as there is use of cost effective electronic component which will create attention of customer towards bag. However other factors such as security etc. are noticed. As today's modern era demands improvement in technology, this automated bag will helps in growing Hi-Tech bag industry and life style of human beings also goods and services of society.

Keywords: Arduino microcontroller, ultrasonic pair, magnetometer, Transceiver, DC motor, Rack and pinion system.

I. INTRODUCTION

Baggage or luggage consists of bags, cases, and containers which hold a traveller's articles while the traveler is in transit. The modern traveler can be expected to have packages containing clothing, toiletries, small possessions, trip necessities along with its automatic operation.

Luggage has changed over time. Historically the most common types of luggage were chests or trunks made of wood or other heavy materials. These would be shipped by professional movers. Since the Second World War smaller and more lightweight suitcases and bags that can be carried by an individual have become the main form of luggage. [1]

Consecutively Smart luggage has been developed to reduce human efforts. Smart luggage is baggage that has a built-in or a removable battery within for its automated operation. It often includes features designed to help with travel, such as USB port for charging of mobiles and other low voltage appliances.

Automated travelling bag is the true robot companion and fully autonomous suitcase. It works seamlessly in crowds and doesn't require any extra peripherals or human efforts. Automated travelling bag can move automatically in autonomous mode as well as manually in manual mode. We can take it with us when we are going to the airport, commuting to work or just walking outside. It'll match our speed accurately and can go as fast as 5.65 kmph[1]

II. OBJECTIVE

- Providing the user friendly and economical automated travelling bag for travellers.
- To develop Hi-Tech bag industry all over the world



Fig Conventional travelling bag

III. COMPONENTS OF SETUP

The main components of the automated travelling bag,

- | | |
|----------------------------|---------------------|
| 1. Power supply | 6. Relay |
| 2. Arduino microcontroller | 7. DC motors |
| 3. Magnetometer | 8. Transceiver |
| 4. Ultrasonic Pair | 9. Stepper motor |
| 5. Voltage regulator | 10. Vibration motor |

IV. WORKING OF AUTOMATED TRAVELLING BAG

1. This idea will allow the people to make their luggage follow them automatically in congested areas too.
2. In this idea Arduino Microcontroller is used to control the working of all the components used.
3. Lightweight and durable power source is used to feed the power to the circuit.

4. Mainly consist of transmitter and receiver circuit out of them receiver is placed in bag while transmitter is carried by the owner of the bag.
5. Arduino ATMEGA is controlling the receiver circuit while Arduino Nano is controlling the transmitter circuit.
6. Both receiver and transmitter circuit consist of Magnetometer which is an electronic device fed by the power through Arduino microcontroller.
7. Magnetometer gives the amount of change in direction along X, Y & Z axis.
8. Readings of receiver's magnetometer are send to the transmitter circuit continuously with the help of transceivers circuit.
9. Transceiver is an electronic device which communicates with another Transceiver with the help of radio frequency.
10. Data received from the transmitter's circuit is analyzed and compared by the Arduino ATMEGA with receiver's magnetometer and resultant data will give the resultant change in direction of owner with respect to bag.
11. According to the resultant data obtained the Arduino ATMEGA will instructs the stepper motors to rotate in respective direction of owner such that the bag will follow the owner.
12. Rack and Pinion steering mechanism is used to turn the bag using stepper motors.
13. To move or to displace the bag two high torque-low rpm DC motors are placed in bag which is fed by the power source of bag.
14. The amount of frequency received by the bag will vary with the distance between the bag and the owner and this resultant amount of frequency received will respectively generate the equivalent value of analogous voltage which is then converted into digital form and analyzed by the Arduino ATMEGA.[2]
15. So that respective of the distance between bag and owner the speed of the bag will manage itself automatically with the help of DC motor speed regulator.
16. In case if there is any obstacle comes in between bag and owner then it can be avoided with the help of Ultrasonic obstacle detection system placed in the bag.[4]
17. If bag goes out of certain limit of range of distance then instantly the Arduino ATMEGA will sends the signal to the Arduino Nano which is then turn on the vibrator placed in transmitter circuit so that owner will get an alert.
18. The manual and automatic operation of the bag is depends on the position of the lever of the bag, if owner pulls up the lever of the bag then Arduino ATMEGA will turn off the automatic operation of the bag similarly if lever of the bag is pushed down then Arduino ATMEGA will starts an automatic operation of the bag.

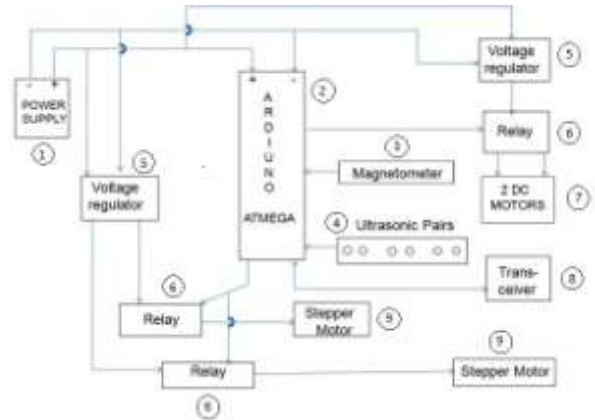


Fig Block Diagram of receiver circuit

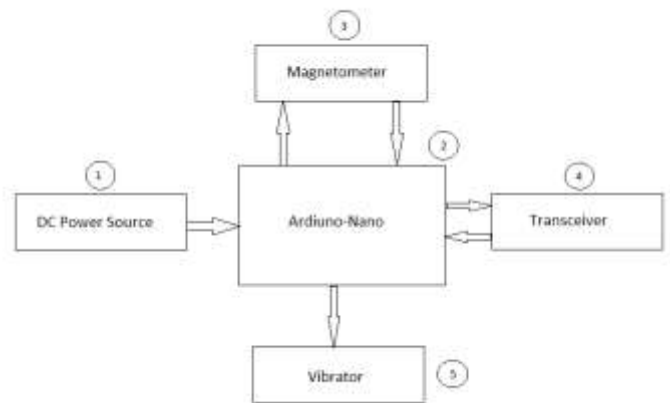


Fig Block Diagram of transmitter circuit

V. ADVANTAGES

- Human efforts required for carrying the luggage bag are reduced by automated owner following bag.
- User-friendly and economical automated travelling bag for travellers.
- Reliable operation, cheaper in cost, etc.

VI. APPLICATIONS

1. Airport.
2. Mall trolleys.
3. Driverless vehicle.

VII. CONCLUSION

By market surveying and needs of human being taking into consideration we have identified the basic construction require for four wheel based solid robot body and the basics of person tracking system. It is also observed that in proposed automated travelling bag not only there is presence of obstacles during the movement of bag along with the bag owner but also the proposed automated travelling bag will not function for stair case operation but if the ideal methodology

will develop in proper way with enough available resources we can compensate the existing stair case problem so that bag can move in any situation or any kind of environment. Thus the effectiveness of automated travelling bag will get increased

REFERENCES

- [1]. Joachim Hertzberg and Frank Kirchner. Landmark based autonomous first Euromicro Workshop on Advanced Mobile Robots (EUROMICRO).
- [2]. <http://www.atmel.com/images/doc2466.pdf>
- [3]. Betke, Margrit and Gurvits, Leonid, "Mobile Robot Localization Using Landmarks", IEEE Transactions on Robotics and Automation, Vol. 13, N° 2, April 1997
- [4]. <http://www.labelsensors.com/choose/labelSensorTypes.html>