360 Degree Rotating Vehicle

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Abstract- *Modern development and economical progression of Indian society resulted in increase of cars on rods. Due to space constraints, car parking is the major problem faced in most parts of the country. Present study aims for development of a system to reduce the turning radius of a car. It has turning radius nearly equal to negligible of the length of car itself. This system can be useful in better parking, traffic jam, back turning on narrow roads, etc. The aim of this paper is to foster a 360 turning vehicle. Rather than working by gear framework, we are involving automatic framework for activity of this vehicle. Supplanting two wheel drives by four wheel drive makes more advantageous for the vehicle to proceed.*

Keywords- Modern Automobile, 360 degree rotation, Chassis Framework, Four Wheel Drive.

I. INTRODUCTION

This project is about plan of 360-degree wheel turning vehicle. This vehicle moves every which way, and this plan gives better solace and furthermore spares the season of clients, the vast majority of the general population utilizing this vehicle to convey products, understanding and so on. In any case, often, they need to confront the issue like taking U turn and so forth. So need to structure a 360 degree wheel turning vehicle to lessen and dispose of issues in the business and at the railroad stage. This structure will give better solace and furthermore spares the season of clients that is the reason it is additionally the dependable for the client. As it is likewise battery worked vehicle consequently no fuel is required. Consequently, it is affordable to the society.

Working

The 360-degree rotating vehicle is based on the principle by using tilt the wheel where the vehicle will take a 360 turns. The wheels will drive the vehicle to rotate 360 degrees. The 360-degree vehicle consists of three pneumatic cylinder, one direction control valve, DC motor. The system works when the compressor starts the pressurized air is passed to the direction control valve through pipes. The direction control valve is operated manually. The direction control valve is used to control the path of pressurized air. The pressurized air which is supplied to the cylinder will move the piston in reciprocating motion. The piston cylinder is called as actuator.The piston cylinder then actuates and moves outwards. The linkage which is connected to piston and wheels will push the wheel outward giving them the required motion. In the mean while the dc motor which is connected to the front of the right wheel and to the of the left rear wheel both will rotate opposite to each other if one rotates in clockwise other will rotate in anti-clockwise the switching of motor is controlled manually giving the vehicle 360 turn. The 360-degree rotating vehicle is the name itself giving the meaning that a vehicle takes the sharp turn with zero turning radius and follow exact circular path without leaving its vertical axis passing through the center. As shown in the fig no.1 when the direction control valve is closed it takes it normal position as the pressurized air does not pass to the pneumatic cylinder and the piston cylinder is at it normal position and wheels does not tilt.

II. COMPONENT OF SYSTEM

1) FRAME

The hollow square pipes of material of mild steel are selected for the frame. The pipes are cut into required size by cutting machine. After cutting, the end of the square pipes is grinded so that it became smooth and convenient for welding. The square pipes are welded together to form a rectangular basic frame.

2) DC Motor

Electric motor is machine which convert electric energy into mechanical energy. Is action is based on the principle that when a current carrying conductor is placed in a magnetic field, it experiences a mechanical force whose direction is given.

3) Direction Control Valve

Direction control valve are used for distribution of energy to various actuators by controlling the direction of wheels

4) Adapter

Adapter is used to convert AC current supply to DC current supply. It can be very useful for thermal protection, overload protection. etc. it can also protect from short circuit**.**

5) Wheels

Wheels are the end link of the vehicle which give direct output of the system. They are move on a ground having rubber coating. to outer side of the wheel for gripping. It carries whole weight of the vehicle

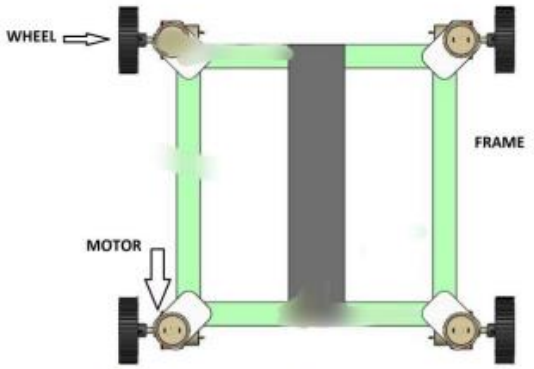

Fig.No 2: 360 Degree Rotating Model Image.

III. OBJECTIVES

1) Designing prototype system.
2) Reduction in turning time.
3) Overcome parking problem
4) To rotate the vehicle without leaving its center of gravity
5) Solves parking issues

IV. CONCLUSION

Different mechanisms were adopted by trial-and-error method, in order to facilitate the engagement of the wheels in the required direction, and the most convenient method was adopted. The time analysis, for the time required to perform a parallel parking maneuver and a 3600 turn was carried out, and it led to decrease in the time required for the performance of the above operations. The prototype was tested to ensure the conformity with Ackermann‘s steering condition, and it complied with the same.

1) Time required for turning is less as compared to conventional steering system.
2) Space required for turning is less.

REFERENCES

[1] JaishnuMoudgil, ShobhakarMengi and Mudit Chopra, 360 Degree Rotating Vehicle to Overcome the Problem of Parking Space, International Journal of Research in Mechanical Engineering and Technology, 5(2), 2015, 22-25.
[2] Dr. G.K. Vijayaragavan& Dr. R. Rajappan, Steering system in car, Automobile engineering, 2008.
[3] Dr. S. Karthikeyan&Dr.S. Chitraselvi, Principles of DC motor, electric drives, and controls, 2004.
[4] Dr. E.V.V. Ramamurthy & Dr. S. Ramachandran, Sprocket, and chain drive, Bearing, Design of machine Elements, 2005.
[5] Dr. G.K. Vijayaragavan&Dr. R. Ramappan, lead acid battery, Automobile engineering, 2008.
[6] P.P.S. Baravkar, T. Kasav, H. Khairnar, C. Khairnar, and P. Wagh, “Design and Optimization of Energy less Conveyor Machine,” no. 4, pp. 996–998, 2021