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Overview of Design & Fabrication of 360 Degree Rotating Vehicle

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Abstract–The project is about 360-degree rotating vehicle. This system is only use for electrical vehicles that moves in all directions. This makes the vehicle fit for function in narrow paths and sharp corners. The typical wheel vehicles face lot of troubles like parking, U turn and much more which takes more time. So, a 360-degree wheel rotating vehicle is designed to decrease and remove troubles that occur when handling material in the industries. In this structure, each of the four wheels has given drive with stepper motors, so it can rotate 360 degree. There are Dc motors drives to move the vehicle in forward and reverse directions. 360-degree rotating wheel is controlled by remote. Accordingly, we will utilize this 360-degree rotating vehicle for different perspectives wish to convey things overpowering bags and moreover in vehicles, which can help in lessening hour gridlock and spare time.

***Keywords*:**360-Degree rotation, Zero turning radius, Only use for electrical vehicle.

1.INTRODUCTION

360° rotating vehicle moves in every directions and this design provides superior comfort and in addition saves time. Normal wheel vehicles face lots of problems like parking, u-turn and much more. So, the design of a 360° rotating vehicle is wanted to lessen and remove problems in the industry as well as common life of people.

The vehicle can spin without moving the vehicle, no additional space is necessary to turn the vehicle. In this system, all of the four wheels is given drives with motors, so it can turn 360°.

The vehicle will be controlled by an remote. Accordingly, we can use this vehicle from different perspectives like to transfer things, overwhelming bags and moreover in heavy- duty vehicles like tractors which will assist in rush hour gridlock and spare time.

As it is similarly a battery-operated vehicle, no fuel is essential. So, it is reasonable to the earth this will likewise reduce the cost of the vehicle. Zero degrees turning radius of has a vehicle suggested the vehicle pivoting around a hub going through the focal point of gravity of the vehicle, for example, the vehicle revolving at a similar spot wherever it is standing. No extra space is necessary to rotate the vehicle.

2. LITERATURE SURVEY

Dr. P. Mohammad Ali [2019] The project is about 360-degree rotating vehicle. This vehicle moves in all directions. This makes the vehicle fit for operation in narrow paths and sharp corners. The typical wheel vehicles face lot of troubles like parking, U turn and much more which consumes additional time. So, a 360-degree wheel rotating vehicle is designed to reduce and eliminate problems that occur when handling material in the industries. **[1]**

Aher Vaibhav Balasaheb [2023] Modern development and economical progression of Indian society resulted in increase of cars on rods. Due to space constraints, automobile parking is the main difficulty faced in most parts of the nation. Current study aims for improvement of a system to decrease the turning radius of a car. It has turning radius nearly equivalent to negligible of the length of automobile itself. This structure can be helpful in better parking, traffic jam, back revolving on narrow roads, etc. The mean of this document is to promote a 360 turning vehicle. Rather than working by gear framework, we are using automatic framework for activity of this automobile. Supplanting two wheel drives by four wheel drive makes extra advantageous for the automobile to continue. The major reason for this venture is to lower the turning sweep and turning space by pivoting at similar spot without leaving its focal point of gravity. In this structure, the

wheels linked with the front axles are gone inverse to each one other, as are the wheels linked with the back hub. The wheels on the one left half automobile pivot in one bearing and the ones on the right 50% of the automobile. To overcome issue like automobile moving on tight streets and during leaving this structure has been proposed. **[2]**

Adedeji. A. Kasali [2023] The design of a 360-degree rotating motor vehicle has been projected as a solution to the troubles encountered in usual wheel vehicles. This article highlights the benefits of such a design, the projected models for implementing the design, and the design of a 360-degree rotating motor vehicle known as AKEA. Traditional wheel vehicles are faced with many troubles such as parking and u-turn. The 360-degree rotating motor vehicle design eliminates these troubles as it can take turns with no moving the automobile, and no additional space is necessary to turn the automobile. The proposed models for implementing the design of the 360-degree rotating motor vehicle contain lifting plates, chain sprockets, chain or belt drives, and quad-steering mechanisms. These models have several shortcomings, including intricacy in design, impractical features and enlarged turning radius. The AKEA design, however, incorporates sustainable and recycled materials, and the outcome of the design procedure was an automobile that performed a variety of features. These features contain side-ways movement, 360-degree rotation, and cell phone operation. AKEA is linked to the mobile phone via Bluetooth, having a range of 100 meters. However, to get better design further, sensors for self-driving and Wi-Fi connectivity for a broader range of connectivity were proposed. In end, the design of a 360-degree rotating motor vehicle is essential to decrease and remove troubles encountered in traditional wheel automobiles. Although numerous models have been proposed, the AKEA design performs a variety of features and can be implemented in modern cars and trucks. Improving the design by incorporating sensors and WiFi connectivity will develop the responsiveness of the mobile application and ensure wider range connectivity. **[3]**

Sarvind Kumar [2020] The project is about 360-degree rotating motor vehicle. This automobile moves in every direction. This makes the automobile suitable for operation in narrow paths and sharp corners. The normal wheel automobiles face lot of troubles like parking, U turn and much more which takes extra time. So, a 360-degree wheel rotating motor vehicle is designed to decrease and remove troubles that take place when handling material in the industries. In this structure, all of the 4 wheels have given drive with stepper motors, so it can turn 360^0. There are 4 Dc motors drive to move the automobile in forward and reverse directions. 360-degree rotating wheel is controlled by RF remote. For that reason, we will utilize this 360^0 rotating motor vehicle for different perspectives wish to transfer things overpowering bags and additionally in vehicles, which can help in lessening hour gridlock and spare time. [**4]**

Sk. Naseer [2019] In the rising modern era, there are numerous types of the automobiles developed in this public, yet many places in this system has very few parking facility and there may be a hard challenge for the parking and retrieving the motor vehicle which is parked. So we have developed a new approach of parking of the vehicles as a project for parking of the vehicles easily called 360 Degree car rotation. This venture hopefully helps in the parking of the automobiles such as cars effortlessly in the parking lot and can also retrieve the automobiles from them. In this development we are using spur gear and worm gear with motor mechanism for lifting and revolution means. **[5]**

Yogendra Kumar [2022] The purpose of this document is to promote a zero turning automobile. Rather than functioning by gear framework, we are involving automatic framework for movement of this vehicle. Supplanting two wheel drives by four wheel drive makes more beneficial for the automobile to proceed. Conventional controlling includes either the Ackerman or Davis directing framework which has major weakness that it can't take least sweep turn. We try to take care of the problem of turning span by new idea of zero turning vehicles with mechanical linkages and automatic shifting. The main basis for this project is to reduce the

turning sweep and turning space by pivoting at similar spot without leaving its focal point of gravity. In this structure, the wheels associated with the front axles are gone inverse to each one other, as are the wheels linked with the back hub. The wheels on the one left half automobile pivot in one bearing and the ones on the right 50% of the automobile. To overcome problem like vehicle moving on tight streets and during leaving this structure has been projected. **[6]**

Jaishnu Moudgil, [2015] offered a 360 degree rotating car to conquer the difficulty of parking space. This car has zero degree turning radius of an automobile implies the automobile rotating about an axis passing through the center of gravity of automobile i.e. the vehicle turning at the similar place, where it is standing. No additional space is required to twist the vehicle. So automobile is to be twisted in the space equivalent to the length of the automobile itself. In this presentation, so got thought of 360^0 wheel rotation automobile and have plane to make 360^0 wheel rotation load carry automobile, this motor vehicle is to be used in various field like industries, hospital, railway platform, etc.**[7]**

Sudip kachhia [2016] offered a 360^0 rotating automobile to conquer the difficulty of parking space. This development is about design of 360^0 rotating car to travel in every direction. This design gives superior comfort and also saves the time of consumers, that's why it is also the reliable for the consumer. As it is also battery operated vehicle thus no fuel is necessary. Hence it is inexpensive to the surroundings. This also reduces the price of the car, and also got idea to use battery to run this car. This helps in maneuvering the automobile in tight spaces such as parking lots and within small compounds. The a variety of functions of the steering wheel are to control the angular motion the wheels, direction of motion of the vehicle, to provide directional stability of the vehicle while going straight ahead, to facilitate straight ahead condition of the vehicle after completing a turn, the road irregularities must be damped to the maximum possible extent. This should coexist with the road feel for the driver so that he can feel the road condition without experiencing the effects of moving over it.**[8]**

K. Lohith [2013] presented a four wheel steering method for a car. In four wheel steering the rear wheels revolve with the front wheels thus increasing the efficiency of the automobile. The way of steering the rear wheels comparative to the front wheels depends on the working circumstances. At low speed wheel movement is pronounced, in order that rear wheels are steered in the opposed direction to that of front wheels with the use of DC motor to turn left and right. In this presentation, the utilization of DC motor is to turn the wheels 90^0 left and 90^0 right from original position. **[9]**

Er. Amitesh Kumar [2014] Presented zero turn four wheel steering structure, a variety of jobs of the steering wheel are, to manage the angular movement the wheels, direction of motion of the automobile, to give directional stability of the automobile while going straight ahead, to make possible straight ahead condition of the automobile after completing a turn, the road irregularities must be damped to the greatest probable extent. This project the use of steering is to turn front wheels.**[10]**

3. OPERATING PRINCIPLE

Dr. P. Mohammad Ali, In this method, all of the 4 wheels have given drive with stepper motors, so it can turn 360^0. There are 4 Dc motors drive to travel the automobile in forward and reverse orders. 360^0 rotating wheel is controlled by RF remote.

Aher Vaibhav Balasaheb, The purpose of this document is to foster a 360 turning automobile. Rather than functioning by gear framework, we are involving automatic framework for movement of this vehicle. Supplanting two wheel drives by four wheel drive makes extra beneficial for the car to proceed.

Adedeji A. Kasali, The design of the 360^0 rotating automobile include lifting plates, chain sprockets, chain or belt drives, and quad-steering mechanisms. These modes have numerous deficiencies, with complications in design, unrealistic features and enlarged turning radius.

SK. Naseer, In this venture we are utilizing spur gear and worm gear with motor mechanism for lifting and revolution purpose.

Yogendra Kumar, The main motive of this venture is to lessen the turning sweep and turning space by pivoting at similar spot without leaving its focal point of gravity. In this structure, the wheels linked with the front axles are gone contrary to each other, as are the wheels linked with the back hub. The wheels on the one left half automobile pivot in one bearing and the ones on the right 50% of the automobile.

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4. OBSERVATION AND DISCUSSION

In some papers they use chain drive mechanism& Gear mechanism to rotate the wheel but the problem they facing is a four wheels are turning 360^0 but it is not turning right-left means forward and reverse. They use steering mechanism but to convert the system in different mode they use different mechanism. To work the both system in one vehicle is not possible in single power cars (petrol, diesel, gas).

In some papers they use stepper motor to turn the wheel but the problem is stepper motor is not able to turn the vehicle right-left at running condition (i.e. only used for forward & reverse) because there is latency in motor. The manual steering is needed to turn the vehicle.

4. RESEARCH OBJECTIVE

- To reduce the pollution (Because this feature is only for electric).
- To reduce the human efforts to turn the vehicle.
- To turn the vehicle 360 degree at one point.
- To reduce the space for turn the vehicle.
- To park the vehicle easily.
- To use this feature in lifting machine used in Industry.

5. REASERCH METHODOLOGY

- Using chain drive gear motor power is transmitted to wheel shaft to give the speed to the vehicle.
- Using gear drive stepping power of stepper motor is transmitted to vertical shaft for changing the direction of wheel (360 degree and normal position).
- Using steering mechanism to turn the vehicle right-left.
- Using arduino we give the direction to stepper motor to rotate the wheel

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