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FABRICATION OF BLUETOOTH BASED 360^0 ROTATING MACHINE

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Abstract: Bluetooth based 360° rotating machine is a special type of vehicle which can rotate 360° along with the vertical axis passing through the centroid of the vehicle. It has zero degree turning radius which means that, the vehicle is capable of rotating at the same place, where it is standing. In this analysis, a model of a simple 360° rotating vehicle has been shown which consists of several dc gear motors, servo motors and a control unit operated by a motor driver with the help of Arduino and the control unit operated by a motor driver with the help of Arduino and the control unit would be governed by an android Bluetooth application through a Bluetooth module.

Keywords: Chain Drives, DC-Motor, Battery, IC 7805, Capacitor and Bearings.

I. INTRODUCTION

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, more often than not, they need to confront the issue like taking U turn and so forth. So, need to structure a 360° 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 earth. This will likewise diminish the expense of the vehicle. Zero degree turning span of a vehicle suggests the vehicle pivoting around a hub going through the focal point of gravity of vehicle for example the vehicle turning at a similar spot, where it is standing. No additional room is required to turn the vehicle. So, vehicle is to be turned in the space equivalent to the length of the vehicle itself. In this framework, controlling is associated with sprocket and this sprocket is associated with sprocket of front wheel by chain drive.

Guiding is utilized to give the course of front wheel. The DC engine is associated with sprocket jolt at above of casing. At the point when control supply from battery to DC engine then revolving movement exchange from DC engine to the wheel. The headings are given beneath sprocket which permit to wheel turn 360° about vertical pivot. At that point this equivalent rotating movement is exchange to the back wheels by sprockets and chain drive course of action. So accordingly, this game plan of the vehicle wheels to turn 90° left and 90° directly from unique position, however front wheels of this vehicle pivot 360° by controlling, sprocket and chain drive game plan. Without moving from the spot, for example the vehicle has zero turning span.

As referenced over, this task is about plan of 360° turning vehicle to move toward all path. This plan will give better solace and furthermore saves the hour of clients that is the reason it is additionally the dependable for the client. As it is additionally battery worked vehicle hence no fuel is required. Consequently, it is affordable to the climate. This will likewise diminish the expense of the vehicle. The brief about this task and subtleties of plan, materials, its assessment and so forth portrayed in resulting segment.

II. LITERATURE SURVEY

Gaurav Sanjay Lad [1], Proposed a system of consist of steering, chain sprocket, DC motor, wheel, bearing, iron pipe, battery and chain drive. In this system first the vehicle is stopped and wheels are then turned within the required direction with help of steering mechanism and DC motor. For the forward and backward movement of this vehicle, DC motors are used in wheel and a battery is used to provide electrical energy for the DC motor. It has turning radius nearly equivalent to negligible of length of the vehicle itself. This arrangement is to be helpful in hospitals, miniature industries and also on railway platforms.

Saravind Kumar et.al [2], Proposed the idea of all electric concept of vehicle is that if it becomes a reality would prove to be a lot of fun to drive in the city. The vehicle works on 8 electric motors, four motors attached uniquely to each wheel and it can rotate 360°. The wheels of the car are magnetically coupled and it is controlled by magnetic fields. Hence the car is rotate fastly and effectively. No extra space is required to revolve the vehicle**.**

Aher Vaibhav Balasaheb et.al [3], 360° rotating car to beat the matter of parking zone. This car has zero degree turning radius of a vehicle implies the vehicle rotating about an axis passing through the axis of gravity of vehicle i.e. the vehicle turning at the similar place, where it's standing. No extra space is required to revolve the vehicle. So, vehicle is to be turned within the space like to the length of the vehicle itself. during this presentation, so got idea of 360°-wheel rotation vehicle and have plane to make 360°-wheel rotation load carry vehicle, this vehicle is to be utilized in different area like industries, hospital, railway platform, etc.

Akash Kluthe et.al [4], the vehicle moves in all told directions. This makes the vehicle suitable for operation in narrow paths and sharp corners. Conventional wheel vehicles face a lot of problems like parking, U-turns and far more which consume longer. So, a 360º wheel rotating vehicle is intended to cut back and eliminate difficulties that occur when handling material within the industries. Accordingly, we'll use this 360-degree rotating vehicle for various perspectives wishing to move things overpowering bags and additionally in vehicles, which might help in decreasing hour gridlock and spare time.

Mohammad Ubaid Ur Rahmaan et.al [5], presented zero turn four-wheel steering mechanism, a variety of functions of the steering wheel are to manage the angular motion the wheels, direction of motion of the vehicle, to supply 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 utmost possible extent. This project the utilization of steering is to rotate front wheels.

Mr. Sharad P. Mali et.al [6], Presented zero turn four-wheel mechanisms, in this project people have used DC motor and wheel to vehicle rotate 360° at a same position. So, in this task, the initiative is to organize of DC motor and wheel. The wheels of the car are magnetically coupled and it is controlled by magnetic fields. Hence the car is rotate Fastly and effectively. It has turning radius nearly equivalent to negligible of length of the vehicle itself.

III. OBJECTIVES AND METHODOLOGY

3.1. Objectives

The main objectives of this Fabrication of Bluetooth based 360º Rotating Machine

- To design and fabricate a model of vehicle that will rotate 360º.
- To reduce the turning radius of a vehicle in order to ensure trouble-free U-turn.
- To establish four-wheel steering mode and parallel parking mode in the vehicle.
- To ensure the proper controlling of the vehicle model by Arduino & Bluetooth Module
- Designing a machine that can move in any direction and rotate 360 degrees using an in-phase steering mechanism.
- Using an Arduino and gear motor to control the machine's movement.
- Ensuring that the machine is controllable via Bluetooth, making it easier to operate.
- Building a machine that is durable, efficient, and safe to use.
- Evaluating the machine's performance and identifying areas for improvement.

3.2. Methodology

Continuous improvement and progressive development of modern technology has brought about the increment of vehicles on streets in a large scale. Besides, due to rapid increase of financial stability, a large number of people use their personal vehicles in their daily life. Most often they need to deal with the issues like short parking places, taking more time to park the vehicle or to take risky U-turns and so on. In that case, 360-degree rotating vehicle is probably the sole solution to park as many cars as possible in small, tight parking spaces with a short amount of time as this vehicle is capable of moving through all directions with respect to the vertical axis.

In this design, the vehicle model will be powered through a rechargeable battery. The control system of this vehicle consists of Arduino, Motor Driver and a Control Unit. Arduino provides the necessary signals to the motor driver first. Motor driver transmits the signal to the four dc motors which are attached with servo motor

horns as well as connected with the four wheels of the vehicle. Horns are operated by Servo Motors as they are directly connected with Arduino. With the help of these servos, horns are capable of having specific angular turn (i.e. 30°, 45° or 90°) and this new position of the horns will be locked up. Then the wheels would start to rotate with the help of dc motors. The 3D Model Bluetooth 360° Rotating Mechanism as shown in Fig.2.

The Bluetooth Based 360 Degree Rotating Machine project involved several stages, including design, construction, testing, and evaluation. The methodology used in each stage is described below:

- **Design Stage:** The design stage involved conceptualizing the machine and creating a blueprint. The design team identified the project's requirements and constraints and selected the appropriate components for the project. The team also used CAD software to create a 3D model of the machine, which helped in visualizing the final product.
- **Construction Stage:** The construction stage involved building the machine based on the design blueprint and assembling the different components of the machine. The team used various hand and power tools to cut and shape the metal chassis, mount the gear motor, and connect the wheels to the chain. The team also soldered the circuit board and connected the various electronic components.
- **Testing Stage:** The testing stage involved testing the machine's functionality and performance to ensure that it meets the project's objectives. The team tested the machine's movement in different directions, its ability to rotate 360 degrees, and its ability to move in tight spaces. The team also tested the Bluetooth connectivity and the Arduino board's performance.
- **Evaluation Stage:** The evaluation stage involved assessing the machine's performance and identifying areas for improvement. The team evaluated the machine's efficiency, reliability, and safety. The team also considered user feedback and suggestions for improvement.

The methodology used in the Bluetooth Based 360 Degree Rotating Machine project was iterative, with each stage building on the previous stage's outcomes. The project team used a collaborative approach, with team members working together to complete different tasks. The team also conducted regular meetings to discuss the project's progress and identify potential issues. Overall, the methodology used in the project ensured that the final product was efficient, reliable, and met the project's objectives.

IV. WORKING PRINCIPLE

The wheel sprockets are connected using a cycle chain. Using the clamp, the dc motor are mounted in the frame. The wheels are connected to the motor via the shaft. A 12v 7amp/hr battery is placed in the back of the frame as shown in Fig. 1. Using wire connections, the motor is connected to the battery. ESP WIFI board is mounted on the setup using a breadboard or card board. The relay boards are fixed in the same place. ESP WIFI board is programmed by interfacing with the relay board. The interfaced electronic setup is then connected to the motor for controlling the motor setup. All the connections are made to connect to the battery. With this the setup is assembled. Now the power supply is given to all the circuits and motors. The WIFI board transmits signal to the device that could pair with it. Usually a mobile device is used to connect the WIFI board and display the web page that has the remote control functions. The load is loaded in the loading area. Using battery power supply the motor starts to operate. The motor operation is controlled by the ESP WIFI board. There are two types of key sets for controlling the motor. The first key set controls the forward and reverse operation of the device. This is achieved by varying the power supply to the motors using the relay board. Forward movement is achieved by giving positive supply and reverse motion and reverse polarity. The Completed Project Model as shown in Fig.3.

V. FIGURES

Fig. 1 Model of Bluetooth 360° Rotating Mechanism

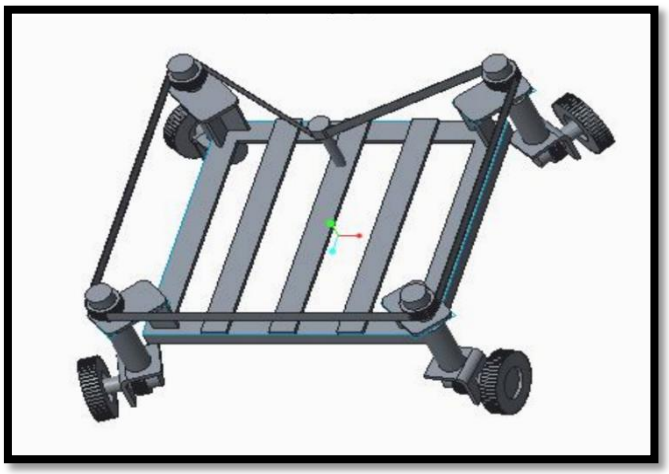

Fig. 23D Model Bluetooth 360° Rotating Mechanism

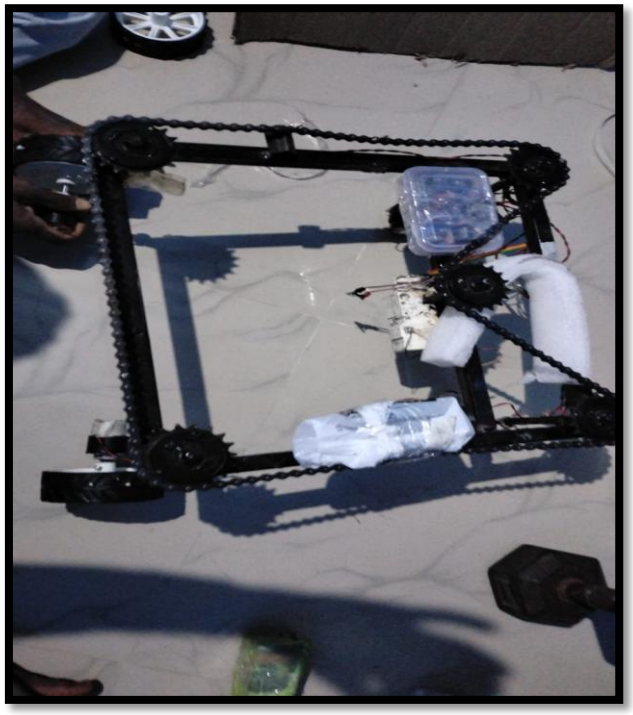

Fig. 3 Completed Project Model

VI. CONCLUSION AND FUTURE SCOPE

6.1 Conclusion

The Bluetooth based 360º rotating machine project demonstrates the feasibility of using Bluetooth technology and Arduino microcontrollers to create a versatile and programmable machine. The project aimed to develop a machine that can rotate 360º and move in different directions using a Bluetooth-controlled steering mechanism. The machine was constructed using a gear motor, metal chassis, and chain. The results of the project indicate that the machine was successfully constructed and operated as intended. During testing, the machine was able to perform various tasks such as transporting materials and maneuvering through obstacles. The Bluetooth connectivity was reliable and allowed for easy control of the machine using a smartphone or computer. The in-phase steering mechanism provided precise control over the machine's movement, allowing for smooth and accurate navigation.

6.2 Future Scope of work

Though the machine has some innovative concepts, there is still a lot if scope for development like

- The machine can be programmed and controlled using a Bluetooth connection and an Arduino microcontroller, allowing for easy customization and automation.
- working in coordination with each other, enabling more complex and efficient automation systems.

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