

DESIGN OF 360 DEGREE ROTATING CAR

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ABSTRACT

Main function of car is to move from one place to another place. we find that every member of the family have their own vehicle. Car provide us lot of benefits like protect us from sun heat in summer and from rain in monsoon. travelling is inevitable part of person's life Car is the most common thing in today's world . Having a car is the status in the society but Having a costly car is a royal status in the society, with increase in number of vehicle people have to face traffic problems like parking, taking reverse etc. So here we have **“DESIGNED A 360 DEGREE ROTATING CAR”** for these above mentioned purposes. These problems can be efficiently reduce and eliminated by the use of this application we use. It operates in a clockwise and anticlockwise direction A primary objective of the present invention is to provide a simple, stable, easy control, smaller space needed and a more concise movement of car To better understand the present invention, detailed descriptions shall be given with the accompany drawings.

Keyword :- Eco-friendly¹, Less noise operation², No fuel required³, Easy parking⁴, 360 Degree rotating⁵.

Introduction

As mentioned above, this project is about design of 360 degree rotating car to move in all direction. This design will provide better comfort and also saves the time of customers ,That's why it is also the reliable for the customer. As it is also battery operated car thus no fuel is required. Hence it is economical to the environment. This will also reduce the cost of the car. The brief about this project and details of design, materials, its estimation etc. described in subsequent section. Most of the people use car in their daily life ,But most of the time ,they have to face the problems like parking, taking U-turns etc. So here we have designed a 360 degree rotating car to reduce and eliminated problems to maintain the traffic. An automotive manufacturer is a company that produces vehicles. Example names of automotive manufacturers include BMW, Ford Motor Company, General Motors, Daimler-Chrysler, Honda, Isuzu, Saturn, Toyota, and KIA, among others. Several different types of vehicles are designed to meet consumer demands. Examples include: pickups (e.g., Ford F-Series, Chevrolet Silverado, GMC Sierra, Toyota Tundra, Nissan Titan), sport utility vehicles (e.g., Ford Explorer, Dodge Durango, Mitsubishi Montero, Oldsmobile Bravada), sport utility trucks (e.g., Chevy Avalanche, Explorer Sport), compact cars (e.g., Honda Civic, Ford Escort ZX2, Geo Metro) and sports cars (e.g., Chevrolet Corvette, Dodge Viper, Porsche 911).

Principle

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 runs on 8 small electric motors, four motors attached separately to four “wheels” the wheels are actually spheres and can rotate 360 degrees around itself like a helicopter. The car is designed for a person taking small trips, probably around a city, who needs to move quickly and nimbly around obstacle like yellow cabs and bicycles.

Maybe the coolest thing about the car is that the doors open. May be Doc Brown could use this electric beauty for some future time travelling flicks. The car's spherical wheels are identical and are magnetically coupled they are controlled by magnetic fields which allow the car to rotate quickly and efficiently.

Though we haven't taken a peak at the inside we hear it's pretty chic. We only have one issue with this design. It may be great with obstacles in front of you but it doesn't look like it could handle a pothole very well. The clearance is quite low and because the “spherical” wheels don't lift you off the ground like regular wheels those pot holes or unexpected curbs could prove to be a problem while you're speeding around the city.

Problem



Figure 1:Traffic Problem



Figure 2:Parking Problem

The main problem associated in city areas is traffic. This condition is very time consuming and also sometimes it is difficult to come out in the emergency situations for example of hospital or fire safety conditions. Here Fig.(1) shows the traffic at the area considered. Sometimes it is difficult to park a vehicle in condition when two car parked one to

another spaced between them. Thus this condition also consumes times for the life style. Also there may be chance of sudden brakeage and chance of accident and damage for the vehicle. Fig.(2) shows the problem associated in parking at certain situation.

Design And Modeling

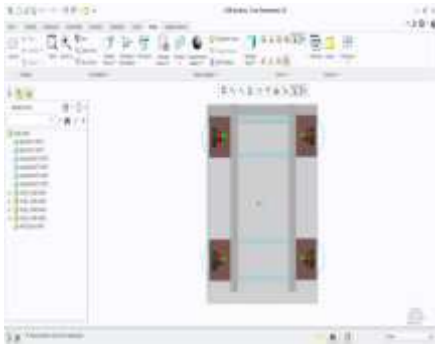


Figure 3:Prototype Car Design

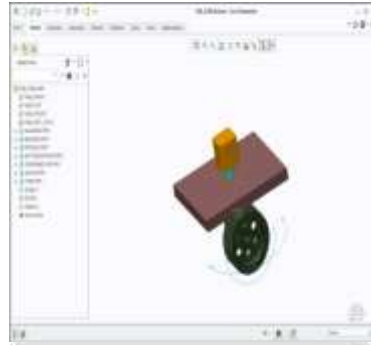


Figure 4:Prototype Tyre Assembly

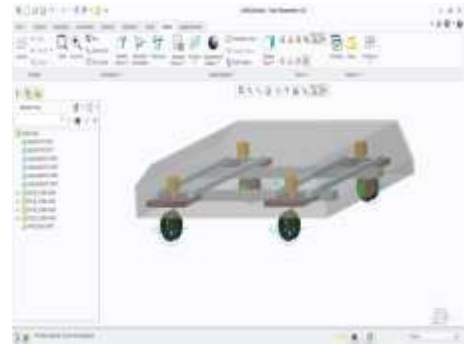


Figure 5:Prototype Car Assembly

DESIGN PARTS

Chassis

Along with the engine and transmission, a vehicle's chassis system is the determining factor when it comes to handling characteristics. The chassis construction influences vehicle driving dynamics, comfort, safety, and road holding ability. This feature, extracted from just-auto's third edition survey of chassis engineering and systems, considers chassis systems definitions and current developments in the field.

A chassis consists of an internal framework that supports a manmade object in its construction and use. It is analogous to an animal's skeleton. An example of a chassis is the under part of a motor vehicle, consisting of the frame (on which the body is mounted). If the running gear such as wheels and transmission, and sometimes even the driver's seat, are included, then the assembly is described as a rolling chassis.

For commercial vehicles, a rolling chassis consists of an assembly of all the essential parts of a truck (without the body) to be ready for operation on the road. The design of a pleasure car chassis will be different than one for commercial vehicles because of the heavier loads and constant work use. Commercial vehicle manufacturers sell "chassis only", "cowl and chassis", as well as "chassis cab" versions that can be outfitted with specialized bodies. These include motor homes, fire engines, ambulances, box trucks, etc.

Gear-Motor

Gear motors are complete motive force systems consisting of an electric motor and a reduction gear train integrated into one easy-to-mount and -configure package. This greatly reduces the complexity and cost of designing and constructing power tools, machines and appliances calling for high torque at relatively low shaft speed or RPM. Gear motors allow the use of economical low-horsepower motors to provide great motive force at low speed such as in lifts, winches, medical tables, jacks and robotics. They can be large enough to lift a building or small enough to drive a tiny clock.

Speed Reduction

Sometimes the using of a gear motor is to reduce the rotating shaft speed of a motor in the device being driven, such as in a small electric clock where the tiny synchronous motor may be spinning at 500 rpm but is reduced to one rpm to drive the second hand, and further reduced in the clock mechanism to drive the minute and hour hands. Here the amount of driving force is irrelevant as long as it is sufficient to overcome the frictional effects of the clock mechanism.

Car Wheel

A wheel is a circular component that is inevitable to rotate on an axial bearing. The wheel is one of the main components of the car and axle which is one of the six simple machines. Wheels, is connected with axles, allow heavy objects to be moved easily facilitating movement or transportation while supporting a load, or performing labour in machines. Wheels are also used for other purposes, such as a ship's wheel, steering wheel, potter's wheel and flywheel. Common examples are found in transport applications. A wheel greatly reduces friction by facilitating



Figure 6:Chassis



Figure7:D.C. Motor



Figure 8:Wheel & Tyre

motion by rolling together with the use of axles. In order for wheels to rotate, a moment needs to be applied to the wheel about its axis, either by way of gravity, or by the application of another external force or torque.

Stepper Motor

A stepper motor (or step motor) is a brushless DC electric motor that divides a full rotation into a number of equal steps. The motor's position can then be commanded to move and hold at one of these steps without any feedback sensor (an open-loop controller), as long as the motor is carefully sized to the application.

A stepper motor system consists of three basic elements, often combined with some type of user interface (host computer, PLC or dumb terminal):

- Indexers - The indexer (or controller) is a microprocessor capable of generating step pulses and direction signals for the driver. In addition, the indexer is typically required to perform many other sophisticated command functions.
- Drivers - The driver (or amplifier) converts the indexer command signals into the power necessary to energize the motor windings. There are numerous types of drivers, with different voltage and current ratings and construction technology. Not all drivers are suitable to run all motors, so when designing a motion control system the driver selection process is critical.
- Stepper motors - The stepper motor is an electromagnetic device that converts digital pulses into mechanical shaft rotation. Advantages of stepper motors are low cost, high reliability, high torque at low speeds and a simple, rugged construction that operates in almost any environment. The main disadvantages in using a stepper motor is the resonance effect often exhibited at low speeds and decreasing torque with increasing speed.



Figure 9:Stepper Motor

Circuit Diagram

D.C. motor circuit diagram & image

Here, S1 and S2 are normally open, push to close, press button switches. The diodes can be red or green and are there only to indicate direction. You may need to alter the TIP31 transistors depending on the motor being used. Remember, running under load draws more current. This circuit was built to operate a small motor used for opening and closing a pair of curtains. As an advantage over automatic closing and opening systems, you have control of how much, or how little light to let into a room. The four diodes surrounding the motor, are back EMF diodes. They are chosen to suit the motor. For a 12V motor drawing 1amp under load.

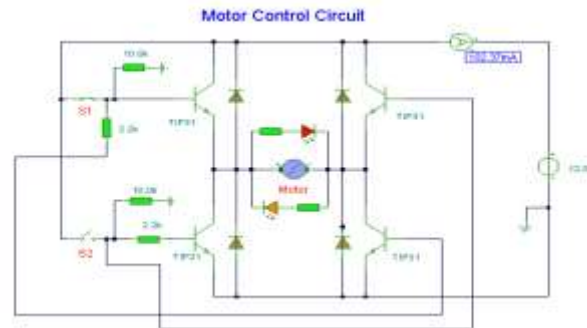


Figure 10:Motor Control Circuit

CONSTRUCTION & WORKING

The Construction of car is as below.

A chassis consists of an internal framework that supports a manmade object in its construction and use. It is analogous to an animal's skeleton. An example of a chassis is the under part of a motor vehicle, consisting of the frame.

Sometimes the goal of using a gear motor is to reduce the rotating shaft speed of a motor in the device being driven, such as in a small electric clock where the tiny synchronous motor may be spinning at 500 rpm but is reduced to one rpm to drive the second hand, and further reduced in the clock mechanism to drive the minute and hour hands. Here the amount of driving force is irrelevant as long as it is sufficient to overcome the frictional effects of the clock mechanism.

A wheel is a circular component that is intended to rotate on an axial bearing. The wheel is one of the main components of the wheel and axle which is one of the six simple machines. Wheels, in conjunction with axles, allow heavy objects to be moved easily facilitating movement or transportation while supporting a load, or performing labor in machines.

A stepper motor (or step motor) is a brushless DC electric motor that divides a full rotation into a number of equal steps. The motor's position can then be commanded to move and hold at one of these steps without any feedback sensor (an open-loop controller), as long as the motor is carefully sized to the application.

Optical support rod Models 40 and 70 have the sturdiness suitable for the majority of general laboratory applications. Both models are 14 in. (356 mm) tall. Model 70 has a nylon gear rack set into the rod for rack-and-pinion control over component elevation. Models 41 and 71 short rods are 7 in. (178 mm) tall and have a smaller resonant vibration

amplitude than the longer rods. Their low profile makes them ideal for compact experimental setups. Models 42 and 72 rods, which have integrated bases, are a full 24 in.

A bearing is a machine element that constrains relative motion to only the desired motion, and reduces friction between moving parts. The design of the bearing may, for example, provide for free linear movement of the moving part or for free rotation around a fixed axis; or, it may prevent a motion by controlling the vectors of normal forces that bear on the moving parts. Many bearings also facilitate the desired motion as much as possible, such as by minimizing friction. Bearings are classified broadly according to the type of operation, the motions allowed, or to the directions of the loads (forces) applied to the parts.

ADVANTAGES & APPLICATION

ADVANTAGES

- 1) Eco Friendly
- 2) Less Noise Operation
- 3) Battery Operated thus No Fuel Required
- 4) Non Toxic And No Hazardous
- 5) Less Costly
- 6) Less Maintenance except battery requirement
- 7) More Efficient
- 8) Car Can Easily Parked
- 9) Saving The Time

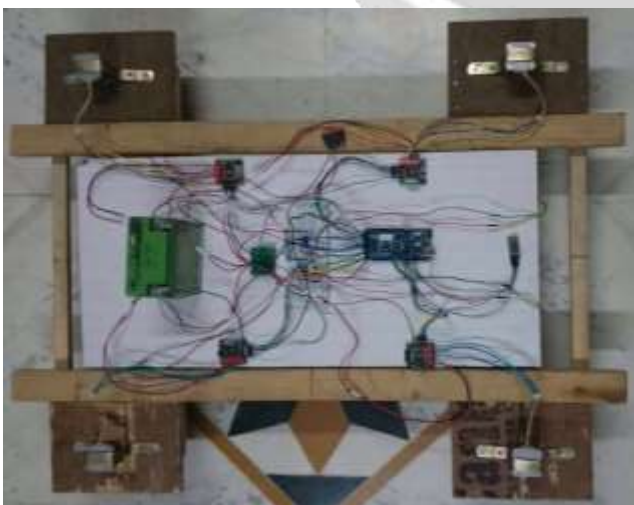
Application

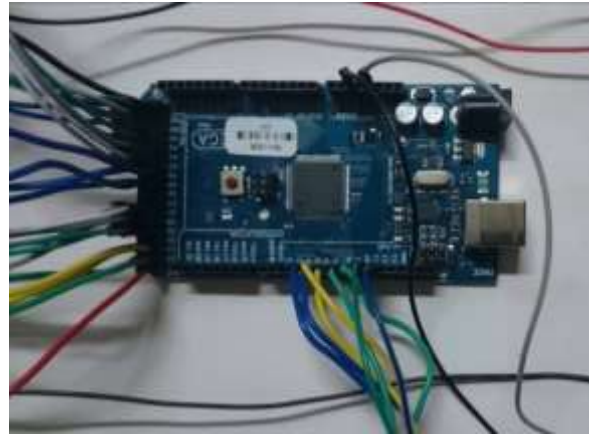
- 1) In Industries for automation of raw material like Automated Guided Vehicle
- 2) In Automobiles Application
- 3) In Big Industries For Transportation of Raw Material
- 4) To Park The Vehicle In Parallel Direction
- 5) Take easily U-Turn

COMPARISION

<u>Battery operated vehicle</u>	<u>Fuel based vehicle</u>
1. Most economical to the environment.	1. Effect the environment, not economical.
2. Most abundant as we use non-conventional energy source.	2. Fossil fuels are not abundant as non-conventional source.
3. Less costly	3. Costlier then battery operated vehicle.
4. Less maintenance required	4. Maintenance cost is higher compared to battery operated vehicle.
5. Higher efficiency	5. Less efficient

PROTOTYPE CAR





CONCLUSION

Thus we conclude that we can allow vehicle to guide vehicle in all direction. 360 degree of rotating car and also we can guide in parallel direction. In recent time the advancement is made in automobiles. So, we have modified in such a way that it can save time and also easily work with many problem. This can give fast response and less space is required. The developed model is recommended for inclusion in the cars.

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