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Multilevel Car Parking System using Geneva Mechanism

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***Abstract:** In the present time there number of vehicles increases door to increasing population. It is very necessary to solve the parking issue by using a various mechanism. By which reducing the parking space and preventing from security is cars. In this paper we study the concept of Multilevel Car Parking System using Geneva wheel mechanism. By study we have to show that how the actual mechanism work and actual structure and components used in that system. The protect us designed parking a car into the Multilevel parking lot.*

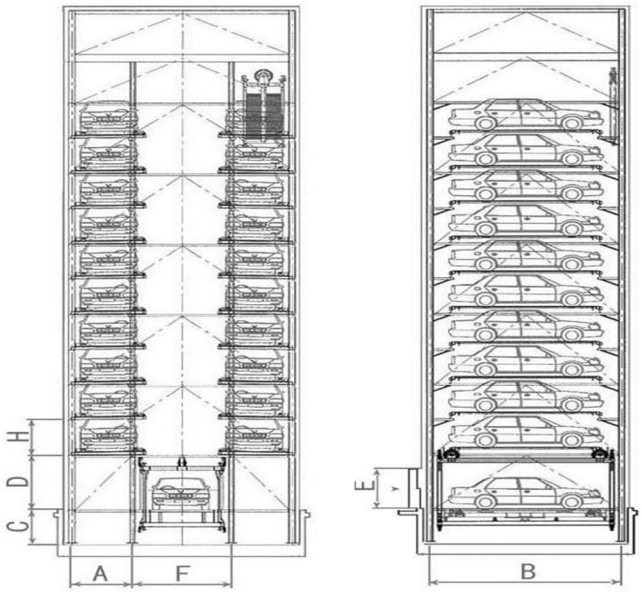
***Keywords:** Chain and Sprocket Mechanism, Pallet, Geneva mechanisms.*

I. INTRODUCTION

The concept for the automated parking system was and is driven by two factors; a need of parking space and a scarcity of available land. The earliest use of an automated parking system was in paris. France in 1905 at the Garage Rue de Ponthiu. The automatic parking system consisted of a ground breaking multistory concrete structure with an internal elevator to transport cars to upper levels where attendants parked the cars. While increasing the population number of vehicles increases in use have combined with sustainability and other quality of life issue Due to lack of well planned policy for parking the demand of parking space is more than the supply of vehicles and manufacturing of vehicles. The paper is devoted to make use of rotary parking system using Geneva wheel mechanism which helps in intermittent motion. Sprocket and chain mechanism are used to rotate the whole rotary line vertical. There are following types of various car parking system.

A. Rotary type car parking system.
B. Crane system.
C. Puzzle system.
D. AGV system (automated guided vehicles).
E. Silo system.
F. Tower system.

We Study on Rotary type car parking system



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II. LITERATURE SURVEY

The multilevel car parking system for vendor is working on simple sprocket chain mechanism with the help of Geneva wheel mechanism. The multilevel car parking system is used to park the car in less space. It will be spread to solve many problems of parking issue and preserve the environments. While doing a survey we have found various research papers using different technology on automated car parking system. Vipul More et al. [1] implemented the concept of microcontroller based car parking system which is used to sence the presence and movements of cars and depending on availability of space is allow parking and same is displayed on LCD panel. There is a RFID module that will provide security as users who have authority can swap the RFID cards and get entry otherwise not. Ankit Gupta et al. [2] implement the automatic car parking system the proposal made was to divide the system automatic car parking vehicles. A review of it is an efficient means of storing vehicles while. Vision based car parking system in which there was a microcontroller have bees used to sense the movement of cars and check, weather there is a capacity of cars to park. Further discussion car parking system implementation. Two DC motors, one is for gate and other is for lifting the lifter carrying the car. 8 infrared sensors, which are mounted two on eachfloor as floor design. There was an LCD display to show the present condition of a parking space an the floor. Rahul J. Kalekar et al. [3] In this paper they implemented the concept of lift mechanism. There are two options for lift one is hydraulic lift and other is traction lift. The hydraulic lift is suitable upto moderate height when height increases it becomes very costly in that case traction lift is better option. The main components of lift is the pallet on which vehicle is placed according to the weight of cars the pallet is being design. Then there was a chain mechanism the pulling force on it. Then after the selection of motor and selection of gear is being done by taking the factor of safety according to power required and selected motor power. Sawankumar G. Narone et al.[4] The chain and sprocket mechanism is used for driving the parking platform. This total prototype is powered by a D.C motor. Taking problem statement from above and studying the fundamental engineering concepts various concepts regarding modern parking system are prepared and amongst those best concepts design has been selected for further phases.

III. METHODOLOGY

In this paper we study the multilevel car parking system using geneva mechanism which will operate the whole rotary parking system. A Geneva wheel mechanism has been used to intermittent movement of a rotation. By used DC motor which is help to rotate the Geneva wheel in clockwise and anticlockwise direction.

A. DC Motor

A DC motor is any of a class of rotary electrical machines that converts direct current electrical energy into mechanical energy. DC motor is used to rotate the Geneva wheel mechanism which is help to rotate whole assembly of the system.

B. Geneva Wheel Mechanism

It is the gear mechanisms that translate continuous rotary motion to intermittent rotary motion. A Geneva Mechanism is a commonly used mechanism for producing an intermittent rotary motion from a uniform input speed. It is used to rotate in clockwise as well as anticlockwise direction. The rotating drive wheel is usually equipped with a pin that reaches into a slot shaped groove locate in the other wheel (driven wheel) that advances it by one step at a time.

C. Sprocket

A sprocket or sprocket-wheel is a profiled wheel with teeth, cogs, or even sprockets that mesh with a chain, track or other perforated or indented material. The name 'sprocket' applies generally to any wheel upon which radial projections engage a chain passing over it. It is distinguished from a gear in that sprockets are never meshed together directly, and differs from a pulley in that sprockets have teeth and pulleys are smooth.

D. Chain

A chain is a serial assembly of connected pieces, called links, typically made of metal, with an overall character similar to that of a rope in that it is flexible and curved in compression but linear, rigid, and load-bearing in tension.

E. Pallet

Pallet is a platform like structure on which the car will stay or lift. It is designed in such way that all car issuitable for this pallet. It is made from mild steel plate and shaped in fabrication process.

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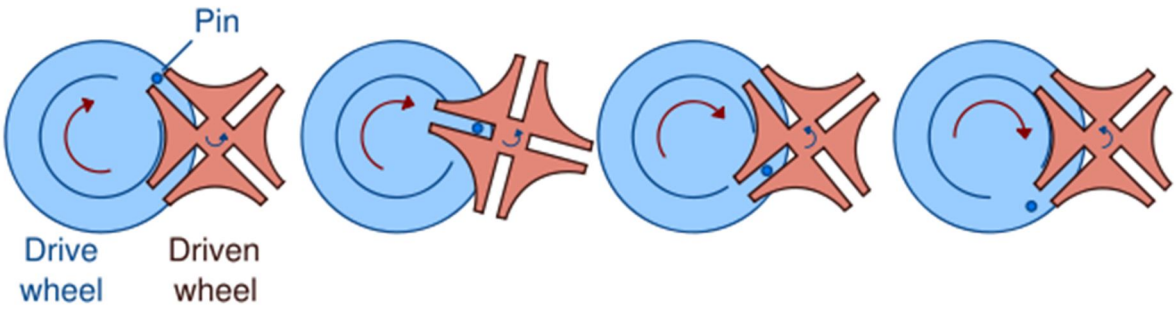
F. Bearing

Pillow Block bearing is used in parking system model. Which connect the shaft and helps to rotate it in clockwise and anticlockwise direction. It is also known as plumber block bearing.

G. Frame Structure

It is a structure in which shaft and bearings are connected. It is a main part of that system which is made by cast iron according to our requirement. Its height can be varies by the requirement of pallets in it.The frame structure is the bone of the multilevel parking system because of whole the structure and parts of the system is to be connected. The material for fabrication of frame is to be selected according to height of frame as height increase number of pallets increases. Due to platform like structure vehicle can easily been park in proper manner and safely, it also include the safety of vehicle in pallet by adding the additional cover walls on both side as well on one side of pallet the only one way is to be open for in and out of vehicle. Cast iron is used for fabrication of pallet due to high performance and safety purpose, weight of the one pallet is almost half of the lightest vehicle. Pallets are hanging on the air with the help of connecting rods which connect the pallets and chain together for the rotation motion, Square bar is used to connect the both connecting rods parallel and helps to rotate whole pallet freely according to weight applied on it. A sprocket and chain mechanism is used to rotate the system in smoothly and in steady operation, according to the size of pallet and the height of frame structure sprocket has been design and fabricated. There are number of 4 to 6 large size sprocket are used in system according to the size of system, Sprocket are free to rotate with the help of Bearings. Bearings are connected to the frame structure by the help of shaft it is connected to the sprocket indirectly. A power shaft is connected to the Main shaft for the power supply it Required high power supply to rotate the whole system. With the help of generator or any DC supply power is to be supplied and adjusted according to system need. Power shaft also connected to the Geneva wheel mechanism which rotate the mechanism in intermittent motion.



The most common arrangement of Geneva wheel mechanism, The driven wheel has four slots and thus advances the driven by one step at a time (each step being 90 degrees) for each full rotation of the master wheel. The whole system work safely due to proper maintainance and regular lubrication.

IV. CONCLUSION

The multilevel car parking system using Geneva Mechanism has been Study; all the part in it were study successfully. The design system could be applied everywhere due to its ease of usage and effectiveness. The car are much safer in such parking system as other do not have an access to the car. The multilevel car parking system is best substitute for car parking area. We can increase the time limit of each full rotation by increasing the slots in Geneva wheel. The total system can handle manually by one person by handling the power supply department.

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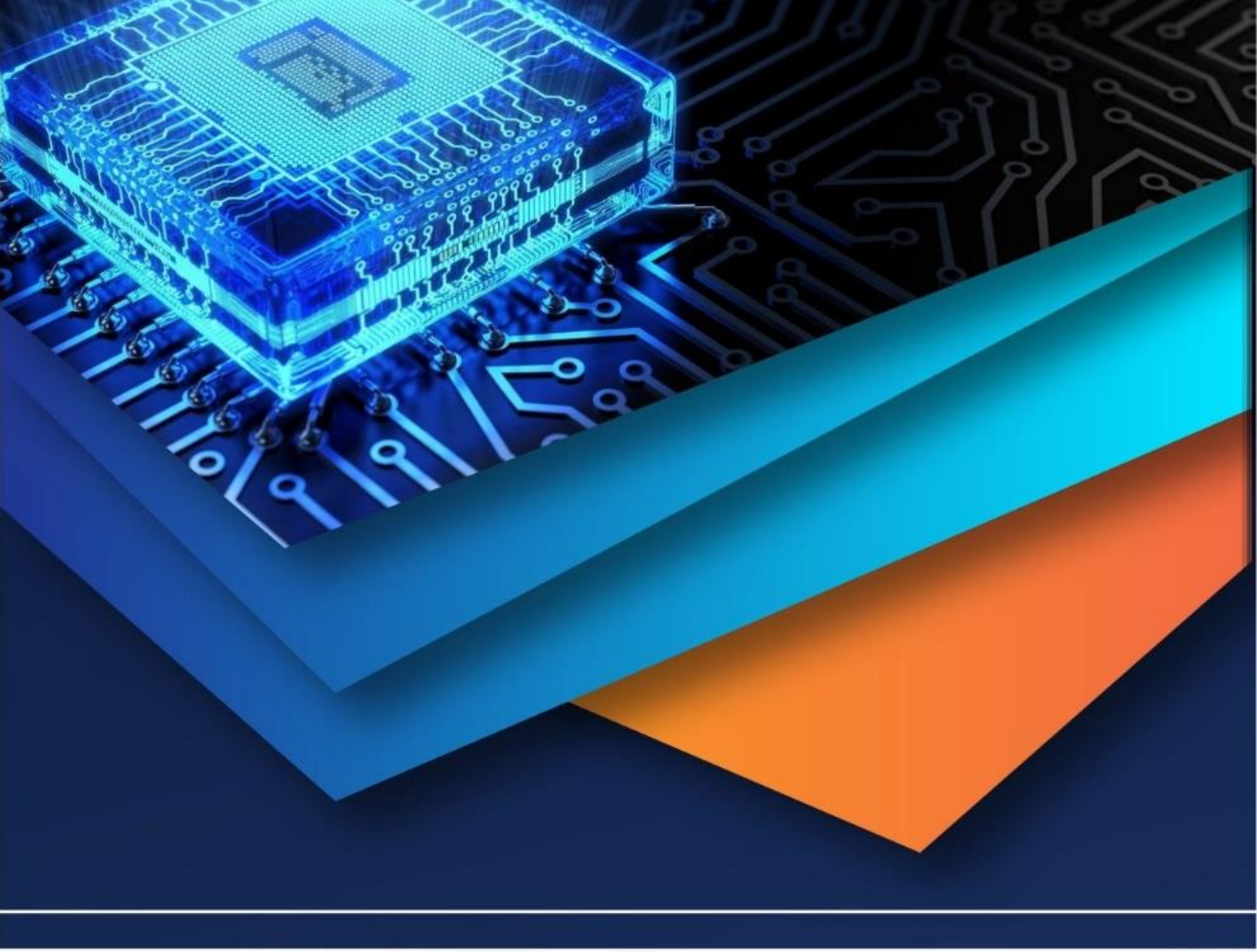

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