

Electric Vehicle Charging in Rotary Parking System

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Abstract: *An Electric Vehicle Charging in Rotary Parking is more like an automated storage and retrieval system for cars. We have introduced EV Charging System in Rotary Parking System keeping Future of EV in mind and The Charging problems that may be come forward in Future.*

Keywords: Rotary Parking System, Chain Drives, Gear Ratios, Solid Beams, Stepper Motor, Chain and Sprocket, Geneva Mechanism

I. INTRODUCTION

A rotary parking system (RPS) is a mechanical system designed to minimize the area that is required for parking cars. On the other hand, Rotary parking is known as "robotic parking garages". Nowadays, with the huge increase in number of cars it becomes difficult to find a parking place; therefore, many countries such as Germany and Japan tend to build rotary parking systems in the areas near to the buildings and markets. The concept for automated parking system is driven by two factors: 1- a need for parking spaces and 2- a scarcity of available land. However, the RPS utilizes a mechanical system to transport cars from parking spaces (rather than the driver) in order to eliminate much of the space lost in a multi-story parking garage. While a multi-story parking garage is like multiple parking lots stacked vertically. An RPS is more like an automated storage and retrieval system for cars. We have introduced EV Charging System in Rotary Parking System keeping Future of EV in mind and The Charging problems that may be come forward in Future.

1.1 Experiment Details

1. Frame
2. Pallet
3. Sprocket
4. Roller chain
5. Beam Rod
6. Bush Bearing
7. Stepper Motor

II. LITERATURE REVIEW

1. All car park owners have their different parking system. Some systems have successfully attracted and meet the requirement of customers. Three parking systems are list as followed:
2. Customize application suitable for various types of landscapes and buildings Structures available below the ground. Ease control by soft touch on the operation panel screen. When a vehicle stops in front of the entrance, automatically door opens and trolley transfers the vehicle to parking cell.[1]
3. It is the first of several large-scale robotic car parks being built to address parking problems in the UAE. All the customer sees are a parking garage with space for one car, though the floor is platform which rides on the top of a robotic trolley. When the customer leaves the vehicle and collects a ticket, the wall of the garage drops away and the car is whisked to an elevator, which in turn takes the car to another trolley. From there, the machine parks the

car in the dark depths of the structure. In total, the process takes around three minutes. With this technology, you do not need to drive through the garage to find a parking space.

III. METHODOLOGY

Firstly, the car arrives to parking slot.

Rotary car parking systems use a similar type of technology to THAT USED FOR mechanical handling and document retrieval. The driver leaves the car inside and plug in the EV charging port then the vehicle is parked at designated area. Hydraulic or mechanical car lifters raise the vehicle to another level for proper storing. The vehicle can be transported vertically (up or down) and horizontally (left and right) to a vacant parking space until the car is needed again. When the vehicle is needed, the process is reversed and the car lifts transport the vehicle back to the same area where the driver left it. In some cases, a turntable may be used to position the car so that the driver can conveniently drive away without the need to back up.

There is one pallet for each parking space; all pallets could rotate in clockwise or counter clockwise direction to the ground floor according to the parking or retrieval order (from the control panel). Each pallet is marked with one number; driver can easily park or retrieve the car simply by pressing the button of the pallet number on the control panel. Fully automatic operation.

A mobile Device Application shows at which place the car is parked and percentage of charge done If the car owner wants his vehicle back, he can access through mobile application and the vehicles reaches down After that the owner needs to complete the payment and take away his vehicle from Parking Premises.

IV. WORKING PRINCIPLE

This section will suggest a mechanical design of the project, this design will match the following procedures.

1. When the car arrives RPS area, the driver enters PIN code and the room's number.
2. the motor will run if the driver gives correct PIN and parking room's number.
3. The car will be then moved to the parking room by the driver.
4. The driver leaves the parking room and press the "HOME" button.
5. the system will return to the home position and the car will be parked.
6. When the driver wants to return his car, he will enter the room's number and PIN, the car will come down to the parking position.
7. The driver will leave with his car and press "HOME" button for returning the system to the home position.

V. EXPERIMENTAL SETUP



VI. CONCLUSION

Vertical Car Parking model has been designed; all the parts in it were manufactured and assembled and tested successfully. Analysis of the model has been done and developed with the scaling of 1:9 for life size model Such as SUVs like Fortuner. As the life cycle model involves proper design and advanced methods are to be used to meet the requirements of the customer. Quick Automated Parking and retrieval of vehicles. Up to 12 cars can be easily and safely parked. Surface space required equivalent to just 2 surface car parking spaces. Most suitable for Staff or dedicated user parking. Engineered to ensure Driver safety by use of an electronic Safety zone. Low maintenance levels required by the system.

ADVANTAGES

- Fast and automatic retrieval of cars from the parking space without removing any cars parked on the ground level of the system.
- One slot left empty at all times for movement of ground-level platforms.
- Compact Power pack systems with rubber bush fittings for reduced noise levels.

ACKNOWLEDGMENT

Ability and ambition are not enough for success. Many able people fail to achieve anything worthwhile because he or she not been properly guided and directed. Success of any project depends solely on support, guidance, encouragement received from the guide, our parents and well-wishers that includes all our staff members and friends. We have been fortunate to have more than one pillar strength in our humble effort to make this project successful. Gratitude is often hardest emotion to express and often one does not find adequate words to convey that entire one feels. We are pleased to express our deep sense of gratitude to our project guide.

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