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ijirset@gmail.com

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Vertical Smart Parking

Meghraj Gadekar¹, Varun jadhav², Pratik Dhainje³, Rutuja More⁴, P. A. Hase⁵

Diploma student, Department of Civil Engineering, JSPM's RSCOE Polytechnic College, Tathawade, Pune, India^{1 2 3 4}

Lecturer, Department of Civil Engineering, JSPM'S RSCOE Polytechnic College, Tathawade, Pune, India⁵

ABSTRACT: In metropolitan cities, vehicle parking has become a major concern in all busy areas and a good traffic system needs a good parking system. Different types of vehicle parking are applied worldwide namely Multi-level Automated Car Parking, Automated Car Parking System, Volkswagen Car Parking, etc. The present project work is aimed to develop a reduced working model of a car parking system for parking 6 to 24 cars within a parking area of 32.17 m². The chain and sprocket mechanism is used for driving the parking platform and a one fourth hp brake motor shall be implemented for powering the system and indexing the platform. The platform is fabricated to suit the working model. The procurement and manufactured items are in hand and are ready to be assembled with the structure. This model is further useful for different branches of engineering in order to develop different types of automations like PLC, Micro controller and computerization etc. By testing analyzing the working model we can defiantly get the view to develop the parking lots at difficult and busy commercial places. The present project work is completed upto fabrication of different parts and the structure and is ready to be assembled. The final assembly is going on and would be completed shortly.

I. INTRODUCTION

It is simple to operate with the driver parking and leaving the vehicle in the system at the ground level. Once the driver leaves the incorporated safety zone the vehicle is automatically parked by the system rotating to lift the parked car away from the bottom central position. This leaves an empty parking space available at the ground level for the next car to be parked on. The parked car is easily retrieved by pushing the button for the relevant position number the car is parked on. This causes the required car to rotate down to ground level ready for the driver to enter the safety zone and reverse the car out of the system. Except Rotary Parking System all other systems use a large ground area, Rotary Parking System is developed to utilize maximum vertical area in the available minimum ground area. It is quite successful when installed in busy areas which are well established and are suffering with shortage of area for parking. Although the construction of this system seems to be easy, it will be par from understanding without the knowledge of materials, chains, sprockets, bearings, and machining operations, kinematic and dynamic mechanism.

The Rotary Automated Car Parking System (RACPS) belongs to the class of rotary smart car parking systems. The traditional parking systems such as multilevel or multi-storey car parking systems (nonautomated), robot car parking systems, automated multilevel car parking systems etc have been implemented on a huge scale. But these systems have a major disadvantage of large space consumption which is successfully eliminated with the use of a rotary car parking system [2]. Moreover, the latter provides the added benefits of flexible operation without the need of an attendant and added security and least chances of vehicle damage. Since the model makes use of composite parts, it is easy to assemble and dismantle and is thus more convenient than the traditional car parking systems. The rotary model is specifically designed to accommodate multiple cars in the horizontal space of two. The structure can accommodate six cars in the space of two and can even be customized to hold a greater number depending upon the requirements of the user and can be efficiently put to use in much space crunched areas. Parking spaces cannot cope with the growth of the number of vehicles. In many urban housing societies, the parking space ratio is 1:1. The vehicles parked randomly, cause the major problem faced in most of the metropolitan cities. The basic structure of the RACPS can be described with the help of following block diagram. Fig.1 depicts the interconnection between the various subsystems of the project. Mechanical parking equipment is also called stereo garage. As compared to the existing parking arrangements, the most obvious advantage is maximum space utilization; it is safer and more convenient. The RACPS is totally automated with the user being given a unique ID corresponding to the trolley being allocated to him/her. This kind of equipment is useful to solve the issue of limited parking space available in busy cities. Evidently, it can be seen that the number of private cars is increasing every year. Private garages, where only a single car can be housed at a time, do not provide a feasible solution to the problem since many families own more than one car. So the task was to design mechanical equipment that can store 6 cars in one normal garage. It is called a rotary parking shaft. The idea is to park and move cars with no disturbance to the already parked cars in RAC

What is Vertical smart parking?

A rotary vertical car parking system, also known as a carousel parking system, is a type of automated parking system that uses a rotating platform to store and retrieve vehicles. This system can be used to increase the number of parking spaces in each area, like a traditional vertical car parking system

Smart parking systems solve the problem of finding spot by providing drivers with information about available spots near them. Drivers can also use the system remotely via their smartphone to find a space before arriving at the parking lot.

II. THE TECHNOLOGY USED IN PARKING SYSTEM

Smart parking can be defined as an I T-powered system that relies on sensors and/or cameras to gather data regarding the availability of spots in a particular parking area. To interact with such a system, a driver needs the right mobile application

III. FUTURE WORKS

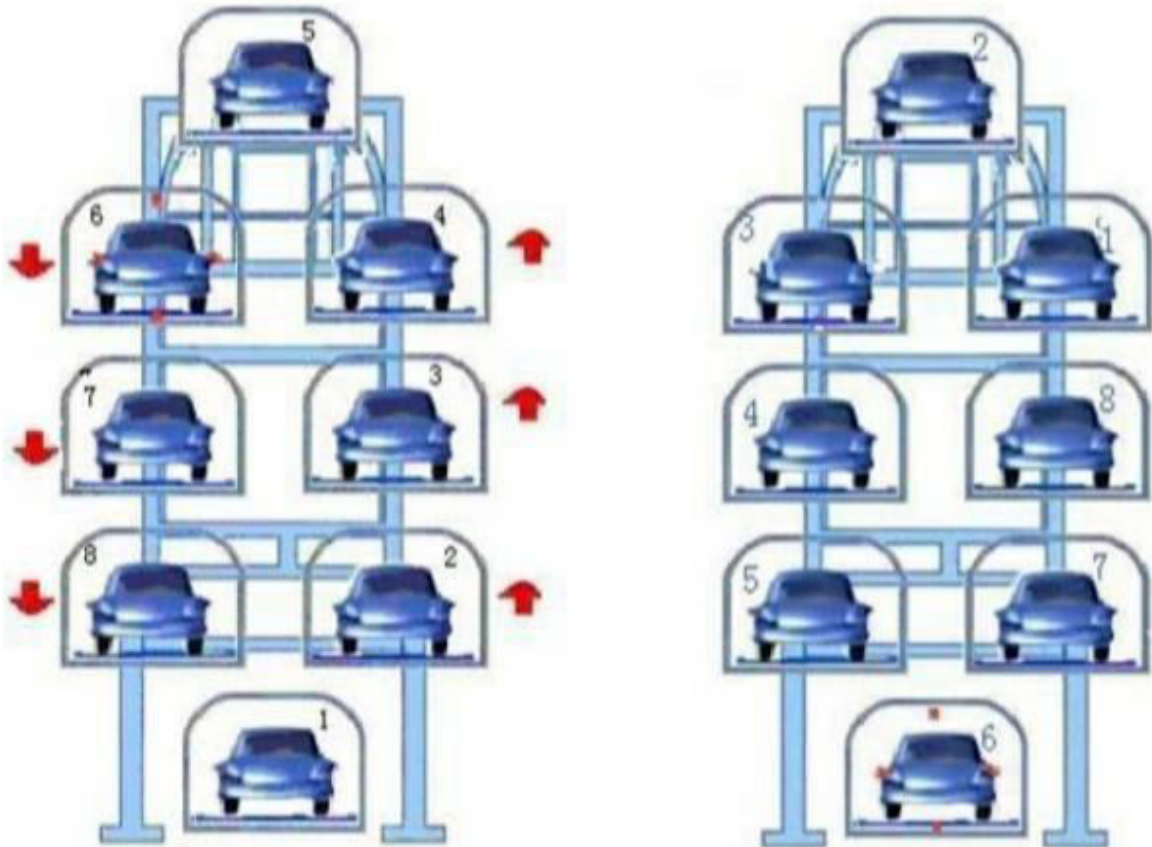
Mobile app can be made for better user experience instead of user interface screen. Parking spaces can be increased. We can enhance our model by following: We can use POS transaction for Fare. We can make use of surveillance cameras for enhancing security and safety. We can use Stepper motor for enhancing the reliability and friendly user experience.

IV. VERTICAL SMART PARKING

A Prototype this project deals with manufacture of a Prototype of Vertical Car Parking System. This system has been implemented to reduce the excess use of land space which is already very scarce in metro cities. Different types of vehicle parking are Although the available designs are made on the ground level, the challenge in front of us is to make the same design for the underground to utilize the maximum benefit of the parking space availability below the ground level.

V. WORKING PRINCIPLE

There is one pallet for each parking space; all Pallets could rotate in clockwise or Counterclockwise 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. Full automatic operation



VI. ADVANTAGES

OPTIMIZED PARKING: - Users find the best spot available, saving Time, resources, and effort. The parking lot fills up efficiently and Space can be utilized properly by commercial and corporate Entities

REDUCED TRAFFIC: -Traffic flow increases as fewer cars are Required to drive around in search of an open parking space.

REDUCED POLLUTION: -Searching for parking burns around one Million barrels of oil a day. An optimal parking solution will Significantly decrease driving time, thus lowering the amount of Daily vehicle emissions, and ultimately reducing the global Environmental footprint.

VII. LITERATURE REVIEW

- Ahmed Shah Department of Mechanical Engineering, Student, Vishwakarma Institute of Technology Pune, India
- Ajit Satpute, Mihir Shinde Department of Mechanical Engineering Students, Vishwakarma Institute of Technology Pune, India
- Dev Shah Department of Mechanical Engineering Student, Vishwakarma Institute of Technology Pune, India
- Sunil Shinde Department of Mechanical Engineering Professor, Vishwakarma Institute of Technology Pune, India



VIII.CONCLUSION

Various system proposed by different authors Helps us to cogently in reserving and also Annihilating the need of searching for parking Spaces in private parking lots. Researchers have Acquired the systems which dynamically arrange The scheme for different drivers as per their Requirement, based on the real-time parking Information. Thus, this concludes that the paper Simplifies the context for the researchers for Innovating various techniques to administrate And solve the problems faced by drivers on day To day basis.

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