

FABRICATION OF ROTARY CAR PARKING SYSTEM

ABSTRACT :-

Lack of space availability has always been a problem in urban areas and major cities and to add to it there are cars parked callously on the streets that further limit the space. In order to handle the issue of parking in busy places various types of vehicle parking systems are used worldwide namely Multi-level Automated Car Parking, Automated Car Parking System, Volkswagen Car Parking[1] and many more. 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. It is an amalgamation of the already developed parking systems with the added advantage of reduced space occupancy by the design of a simpler and compact parking system that is rotary and occupies vertical parking space. 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 various branches of engineering in order to develop different types of automations like PLC, micro controller and computerization. By testing and analyzing the working model we can definitely get the view to develop the parking lots at difficult and busy commercial places.

INTRODUCTION:-

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 (non-automated), 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 customised 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.

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 RACPS.

FEATURES

- It ensures quick and automated parking and easy retrieval of vehicles.
- Up to 6 cars can be easily and safely parked in the designed model.
- The surface space required is equivalent to the parking space of two cars only.
- Most suitable for parking in offices, malls and similar places .
- The RACPS is engineered to ensure driver safety by use of an electronic safety zone.
- Low maintenance levels are required by the system.
- Does not require any parking attendant.
- It can be easily constructed in a small area, just requiring a simple concrete base and 3 phase electricity.

FUTURE ENHANCEMENT

The RACPS can be installed with a safety installation such as, whenever there is human movement in the system, the rotation of the system should be immediately stopped. The

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platforms can also be equipped with safety sensors guiding the movement of vehicles in the platforms. Moreover, the model can be programmed in such a way that the trolleys traverse the minimum possible distance during parking as well as the retrieval of the vehicle.

MECHANICAL ASSEMBLY

Although the construction of this system seems to be easy, it will be difficult to understand without the knowledge of material's , chains, sprockets, bearings, machining operations, kinematic and dynamic mechanism's. All the calculations are done and accordingly each and every part of the parking system is bought into reality.

ASSEMBLY OF PARKING SYSTEM

For designing the parking system proper views of the design were made. Top,Front and Side views are made, as shown below, according to the model of Rotary Automated Parking.