

Automated Multi-storeyed Circular Parking System

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Abstract

With the increasing use of automobiles, the demand for safe and convenient parking systems has become inevitable. Parking in crowded places has indeed become laborious and time consuming. This emerges the need for automation in parking systems.

In the "AUTOMATED MULTI-STOREYED CIRCULAR PARKING SYSTEM" we are mainly concerned with the ameliorations in the fields of car parking systems. This system includes a multi-storeyed building for parking cars which can be constructed above as well as below the ground level. Each floor of this building is drawn into concentric circular rings containing parking slots. The inner and outer ring of slots is connected by means of a rectangular plate which revolves between the two circular rings of slots. A slider will be mounted on this rectangular plate which will lift the car from the elevator and park it in the parking slot and vice versa. The position of rectangular plate is controlled with help of mechanical switches. The whole mechanism will be controlled by microcontroller 8051.

For the safety of cars, scratch card and password verification systems are used. A magnetic card will be used as a scratch card and an optocoupler will constitute the card detection system. A 10 digit keypad is used for entering the password. For the convenience of the users, an LCD will display instructions for the user while red and green LEDs will indicate whether the system is busy or ready for use respectively.

1. INTRODUCTION

Now-a-days, though automated parking systems have become common, still we intended to implement a system which will eliminate almost all the shortcomings of most of the existing systems. Our prime focus is on maximum utilization of the available space, a major factor scamped in many parking systems. Equipped with multiple elevators, the operational speed of RPS has augmented several times than that of conventional system. In addition to it, we aimed in preventing hazards of accidents and providing insouciance to the car users yet by involving minimal use of human labour.

The International Organization of Motor Vehicle Manufacturer displayed latest statistics on global car production which states that cars make up approximately 87% of the total motor vehicle's annual production in the world. This is only the consequence of increased standard of living that has urged people to opt for a more sophisticated and luxurious lifestyle.

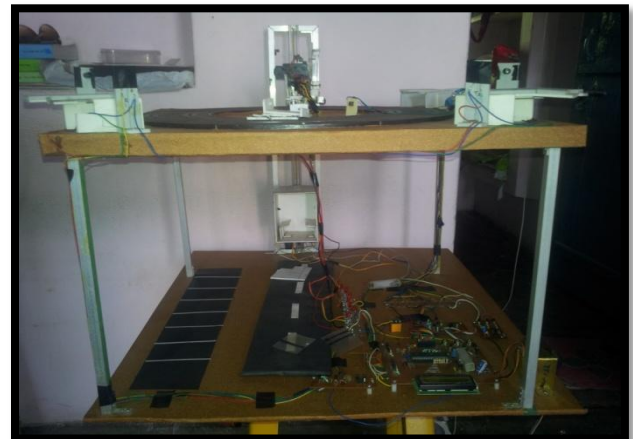
Travelling comforts have made cars a trend in public transport. A world wide survey reveals that there are over 550 million cars on road at a time and this rate is increasing at the rate of 5% per annum. As the number of cars increases there increases, the demand for a better and comfortable parking systems throughout the world for commercial and residential

buildings, professional offices and also in the areas of high public attraction.

A multi-storeyed parking system can be an automated one or it can be a manual system. Such systems can be implemented above or below the ground level and it aims at providing parking space to large number of cars in a comparatively smaller area. Here it becomes quite necessary to quote an example of an existing parking system situated in a very crowded area in Tulsibagh in Pune. It is a manual multi-storeyed parking system containing steep slopes, blind turns and a single path for both entry and exit. Now, it need not be mentioned what degree of menace must be created everyday in that parking system on account of traffic jams, accidents, quarrels and sometimes, even physical assaults.

HARDWARE SETUP

The car parking system has been fabricated by wooden frame. Besides different types of hardware arrangements are needed here (Fig.1). All the hardware needed for the set up is described below.



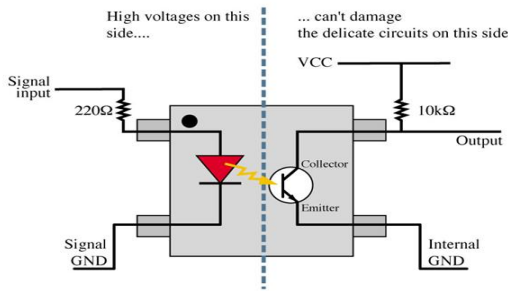
A) Elevator

B) Slotted Optocoupler

An optocoupler, also called opto-isolator, is an electronic component that transfers an electrical signal or voltage from one part of a circuit to another or from one circuit to another, while electrically isolating the two circuits from each other. It consists of an infrared emitting LED chip that is optically in-line with a light-sensitive silicon semiconductor chip, all enclosed in the same package. The silicon chip could be in the form of a photo diode, photo transistor, photo Darlington, or photo SCR.

The slotted optocoupler is available with photo transistor and photo Darlington photodetectors, with the device package structured to provide an additional element of control. The package normally has an air gap between its two sections measuring about one-eighth of an inch in width. One

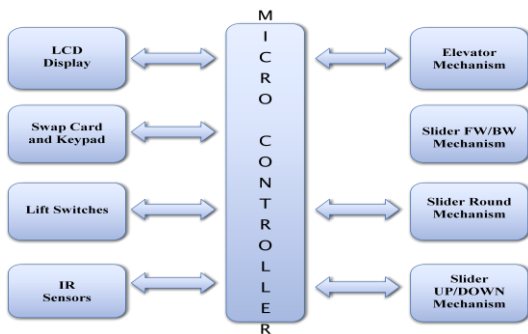
section has an infrared LED and the other, a photo detector. As shown below:



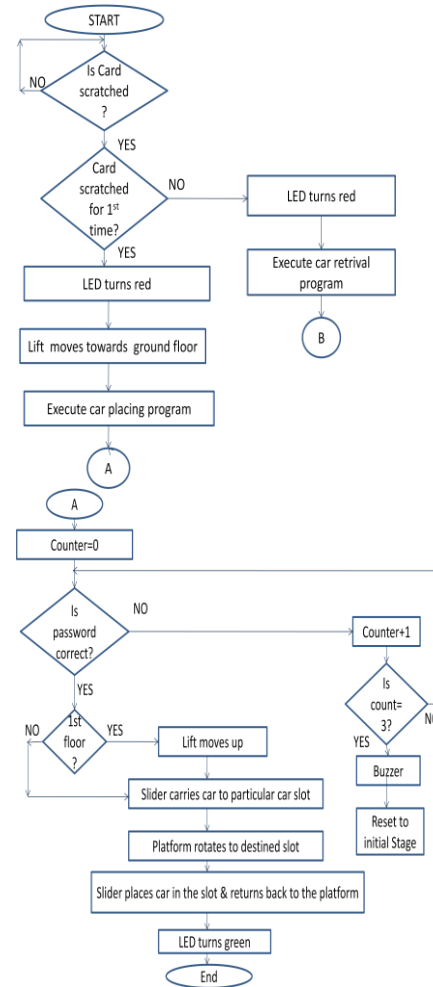
C) DC Motor and Gearbox

An electric motor uses electrical energy to produce mechanical energy, through the interaction of magnetic fields and current-carrying conductors. In any electric motor, operation is based on simple electromagnetism. A current-carrying conductor generates a magnetic field; when this is then placed in an external magnetic field, it will experience a force proportional to the current in the conductor, and to the strength of the external magnetic field. Opposite (North and South) polarities attract, while like polarities (North and North, South and South) repel

2. METHODOLOGY



3. FLOWCHART



4. CONCLUSION

4.1 PECULIARITIES

In terms of Design:- it has better space utility than existing systems. It is flexible system in such a way that it can be moulded into rectangular as well as circular system and can be implemented underground or above the ground level. Efficient space utilization results in buildings with lesser heights

In terms of security:- in RPS systems there is facility of scratch card and password system which allows secure parking. Because of this security, there are lower car theft risks.

4.2 COMPARISION

RPS vs vertical system:- since RPS system allows parking of more number of cars in equal area as compared to vertical system, it results in lesser building height. Because of lesser height of building, time required to park the car is less comparatively. There is less numbers of sliders as compared to vertical systems.

RPS vs. Circular system:- there is better utility of inner as well as outer layers as compared to present circular system. here is least space wastage over wide areas as compared to

Present circular systems.

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