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MODELLING OF VERTICAL CAR PARKING SYSTEM

Katik D. Bhujade [1], Adarsh S. Shahu [2] ,Asharaf Ali Saiyyad[3]

[123]*(Department of Mechanical Engineering/ R.T.M.N.U.,India)*

Abstract:- In this paper, the essential multi-level auto stopping framework with three stories is considered to demonstrate the utilization of control frameworks in stopping frameworks Absence of space availability has dependably been an issue in urban ranges and real urban areas and to add to it there are autos stopped unfeelingly in the city that further breaking point 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 [1], Volkswagen Car Parking and many more. The present undertaking work is expected to add to a decreased working model of an auto stopping framework for stopping 6 to 24 autos inside of a stopping territory of 32.17 m². It is an amalgamation of the officially created stopping frameworks with the additional favorable position of lessened space inhabitance by the configuration of a more straightforward and smaller stopping framework that is revolving and involves vertical parking spot. The chain and sprocket component is utilized for driving the stopping stage and a one fourth hp brake engine should be actualized for fueling the framework and indexing the stage .The platform is fabricated to suit the working model. By testing and analyzing the working model we can definitely get the view to develop the parking lots at difficult and busy commercial places.

Keywords: - automation, Load modeling, Mechanical parking system, Rotary parking system

I.INTRODUCTION

The smart parking system implemented mainly in the developed countries with the in-corporation of advanced technologies and researches from various academic disciplines. With its arrangement in the auto park, it is trusted that it would tackle the previously stated issues confronted by the supporters inside of the auto park. Time and cost are two important factors of human life, whether for an individual or a business. As quality of life increases, more and more people are in inhabiting cities. Shopping complexes are an important point of interest both for a city's inhabitants as well as for visitors. Consequently, more shop proprietors like to find their business in shopping buildings to target more clients and expansion income. Giving adequate stopping to guests is one of the primary issues in creating shopping buildings. Offering and paying consideration on crippled drivers are a couple of the components which can build client faithfulness and draw in clients to visit a shopping center all the more much of the time.

II.   PROJECT OBJECTIVE

To develop an intelligent, user friendly automated car parking system which reduces the manpower, traffic congestion and fuel consumption of the vehicle[3]and to offer safe and secure parking slots within limited area.

2.1. STATEMENT OF PARRKING LOT PROBLEM

2.1.1. DIFFICULTY IN FINDDING VACANT SPACE
Rapidly finding an empty space in a multilevel parking garage is troublesome if not inconceivable, particularly on weekends or open occasions. Finding spaces during weekends or public holidays can take more than 10 minutes for about 66% of visitors. Stadiums or shopping malls are crowded at peak periods, and difficulty in finding vacant slots at these places is a major problem for customers.Deficient Auto Park spaces \ lead to activity blockage and driver disappointment.

2.1.2. IMPROPER PARKING
On the off chance that an auto is stopped in a manner that it possesses two stopping openings as opposed to one, this is called inappropriate stopping .Improper stopping can happen when a driver is not watchful about another driver's rights. This is handled by the advancement of robotized stopping framework .This is a more genuine illustration of ill-advised stopping. The auto is clearly hindering the walkway yet all the more essentially, it is additionally discouraging road movement.

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2.1.3. PARKING FEE PAYMENT

Stopping expense installment can be a period expending movement for individuals. Since numerous ebb and flow installment machines simply acknowledge little notes and coins, finding the precise sum and lining for installment is not lovely for drivers. Consequently, giving administrations that make installment helpful is alluring. One review demonstrated that lining up for installment and discovering coins for stopping expense installment is troublesome. Also, most respondents concurred that utilizing the Touch "n" Go (a framework that permits essentially swiping a card and deduct charges from inside credit) is helpful and will diminish line up time.

## III.   MTERIAL AND METHODOLOGY

3.1 COMPONENTS OF THE DESIGN

3.1.1 BEARINGS

He bearing has inward and external races and an arrangement of balls. Every race is a ring with a section where the balls rest. The section is normally formed so the ball is a somewhat free fit ready. In this manner, on a basic level, the ball contacts every race at a solitary point. In any case, a heap on a boundlessly little point would bring about endlessly high contact weight. By and by, the ball distorts (smoothes) marginally where it contacts every race, much as a tire levels where it touches the street. The race additionally gouges marginally where every ball precedes it. In this manner, the contact in the middle of ball and race is of limited size and has limited weight. Note additionally that the twisted ball and race don't roll completely easily in light of the fact that distinctive parts of the ball are moving at various paces as it rolls. Subsequently, there are restricting powers and sliding movements at every ball/race contact.[3]
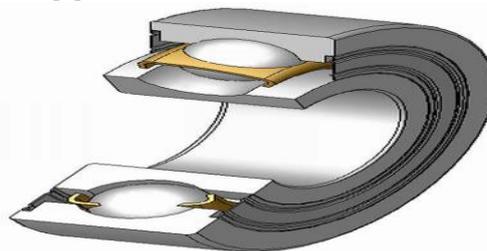
3.1.2. HOLLOW PIN CHAIN

In Hollow Pin Chain, the pin has a hole, allowing for the installation of various attachments. Usually these chains are used for conveyors.
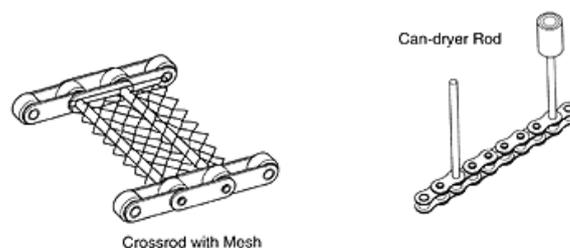

1. The hollow pin is at the center of articulation, and always keeps the pitch length. Regardless of whether the chain is straight or wrapping around the sprocket, the center distance of attachments is always the same shows an example of installing a mesh net. Even when the chains bend, the mesh net does not expand or contract.

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2. With a cross rod over two chains, the load from the attachments is distributed to both sides of plates equally. The chain can fully use its strength and not twist.

3. It is easy to change, maintain, and adjust attachments.

3.1.3. SPROCKETS

A sprocket is a profiled wheel with teeth that work with a chain, track or other punctured or indented material. It is recognized from a rigging in that sprockets are never fit together straightforwardly, and varies from a pulley in that sprockets have teeth and pulleys are smooth.

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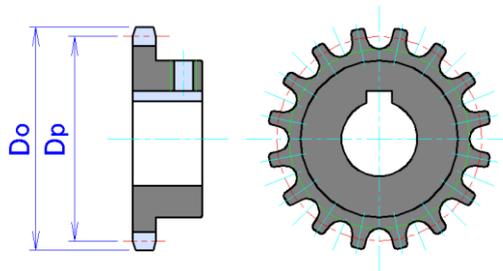
Do = Diameter Sprocket

Dp = Diameter Pitch

Method to design sprockets:

Calculation part for sprocket, where P is the pitch of the chain, and N is the number of teeth on the sprocket;

Diameter of Pitch $= P \div \sin (180° \div N)$

Outer Diameter $= P \times (0.6 + \cot (180° \div N))$

Thickness of sprockets $= 0.93 \times$ Roller Width $- 0.006"$

Here principal thing you have to know not out a sprocket is the measurements of the chain which is to keep running upon it, particularly the pitch, roller distance across, and the roller width of the chain. The second thing you have to know is the quantity of teeth in the sprocket, which will depend altogether on your application. From these numbers, the outside width and thickness of the required clear can be figured.
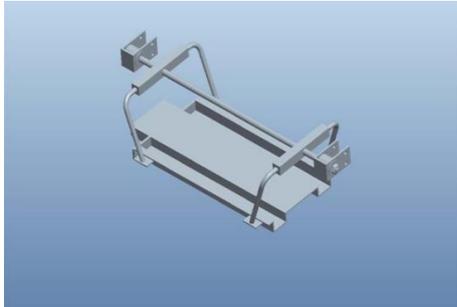
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IV.   MODELING

3.1. PLATFORM ASSEMBLY
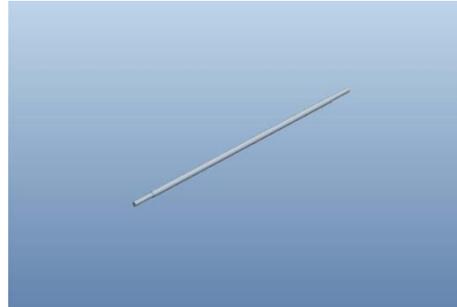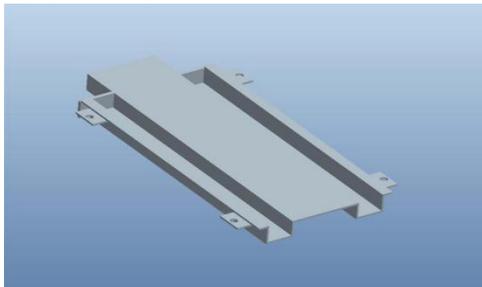
Fig: Platform Assembly

3.2. PLATFORM

Fig: Platform
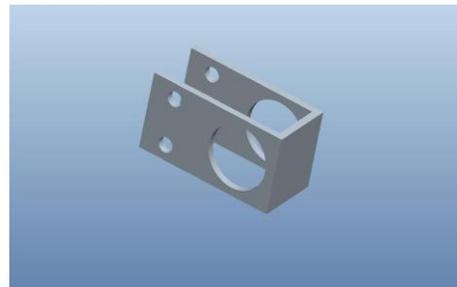
3.3. L SHAPE ROD

Fig: L Shape Rod

3.4. SQUARE ROD

3.5. BEAM
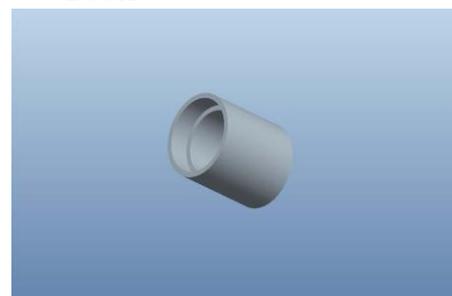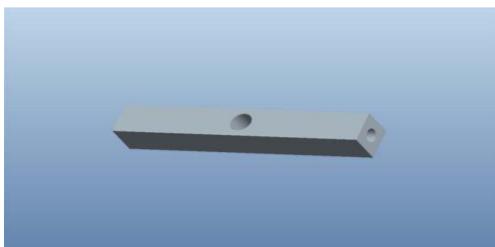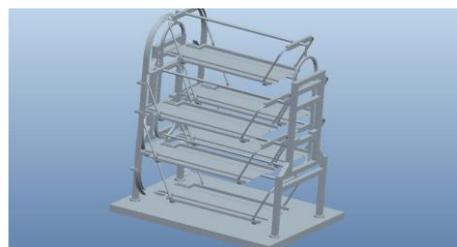
Fig: Beam

3.6. U CLAMP

Fig: U Clamp

3.7. BUSH

Fig: Bush

3.8 ASSEMBLY OF PARKING SYSTEM

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V. CONCLUSION

Our Smart Car Parking model has been outlined; every one of the parts in it are made and we are under get together which will be finished soon. Examination of the model must be done when adding to an existence size model. As the life cycle model includes gigantic cash, appropriate plan and propelled techniques are to be utilized to meet the prerequisites of the customers .Although we created working model of the first one, we attempted most extreme to add to a copy of unique and we were bargained just in those stages where the work can't be finished by accepting or dismissing few variables.

4.1 ADVANTAGES

1. Up to 12 autos or 10 SUV's can be effortlessly and securely stopped.
2. Fast Automated Parking and recovery of vehicles.
3. Surface space obliged identical to only 2 surface auto parking spots.
4. Most suitable for Staff or committed client stopping.
5. Built to guarantee Driver wellbeing by utilization of an electronic Safety zone.
6. Low support levels required by the framework.
7. Does not require a stopping chaperon.
8. Effortlessly built in a little range, simply requiring a basic solid base and 3 stage power.
9. This framework is practical when additional area for surface stopping is not accessible.
10. Turning stopping is to a great degree solid and has been all around attempted and tried with numerous reference locales accessible.
11. It can be implicit turntable in the framework.

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