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Review On Motorized Shutter With Theft Alarm

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ABSTRACT

Roller shutters are usually defined as a vertical revolving barrier at the entrance of building or room, traditionally made of metal or wood, which its leafs, curtains or slats will be rolled upwards during its opening position and downwards during closing position. Due to the advancement of new inventions, roller shutters are also made of various materials such as aluminum, plastic, coupled with other insulations. The advantage of using roller shutter is for space efficiency and to provide a clear unobstructed opening, while completely securing and compartmentalizing the entrance hole during closure. it is a type of door or window shutter consisting of many horizontal slats (or sometimes bars or webbed systems) hinged together. The shutter is raised to open it and lowered to close it. Roller shutters have many applications, including doors for garages, warehouses, shops, etc. These shutters over the years, if not maintained properly get rusted, and it takes lot of effort to lift them, usually this effort is so high that it can cause back injury to the operator, thus it is important to design a motorized system which can facilitate the opening and closing of shutter by the press of the button and thus reduce the back injuries.

INTRODUCTION:

Over the years roller shutters have been used for security purpose with opening and closing feature in every commercial as well as residential areas like doors for vans, garages, shops, schools, prisons and warehouses, if not maintained properly it gets rusted, and it takes a lot of effort to lift them, usually this effort is so high that it can cause back injury to the operator. Even for large size shutters it is impossible to lift them without any mechanism. Considering these problems it is important to design a motorized

system which can facilitate the opening and closing of shutter by the press of the button and thus reduce the back injuries. Thus it is important to design such mechanism for safety purpose. In this project keeping in mind those problems, we have designed Gear Motor system assembly to automate the Rolling shutter operation that can provide safety to the operator. First we have studied different types of shutters available in the market and accumulated the design specification for selected shutter from the manufacturer

OBJECTIVE OF THE PROJECT

1) To design a motor driven gear assembly, this can be easily mounted on new or existing shutters to make them work automatically.

2) This will significantly reduce human fatigue to operate roller shutters.

3) To design such a mechanism which is economically low cost.

4) Easily mountable on existing shutters.

5) Less skilled person can easily operate.

6) Reduce back injuries due to shutter operation

PROBLEM DEFINITION

These shutters over the years, if not maintained properly get rusted, and it takes lot of effort to lift them, usually this effort is so high that it can cause back injury to the operator, thus it is important to design a motorized system which can facilitate the opening and closing of shutter by the press of the button and thus reduce the back injuries.

SCOPE OF PROJECT

Automation can be achieved through computers, hydraulics, pneumatics, robotics, etc., of these sources, pneumatic form an attractive medium for low cost automation. The main advantage of all pneumatic systems are economy and simplicity. Automation plays an important role in mass production. Nowadays almost all the manufacturing process is being made automatic in order to deliver the products at a faster rate.

LITERATURE REVIEW

K. VENGATESVARAN and et al., presented the remote-controlled rolling shutter using a sensor . In this project the main objective is the shutter operate as manual and also motor , This is two in one process. In the project the bevel gear mechanism is used to sensor this type is INFRARED. This remote control is used to ON-OFF the motor. The final outcomes the project is the running the shutter using remote control . The scope of the project is to reduce the manual work and human injuries due to shutter operation.

Vipin Khandar and Dr. A. V. Vanalkar presented the market and accumulated the design specification for selected shutter from the manufacturer. Using this design specification, a CAD model of Gear motor system assembly of rolling shutter modeled in CAD software solid works. In fem software HYPERMESH mesh model of the Gear motor system assembly generated and processed to the linear static analysis using NASTRAN. From the results we concluded that stresses obtained in static analysis are within the limits, hence the design of gear motor assembly to automate the rolling shutter operation is safe.

Ekejiuba CO , Folayan GB 'Remote controlled security door' to performing the security door controlled by remote control by using a microprocessor control unit and using the sensor control.

Kushali Sindhia , Mathumitha Prakash , S.V.Sathish ' Design of smart rolling shutters for low cost operations' to design the smart rolling shutters and operate the shutters by the performance of motor and piezoelectric sensor.

Benmabrouk. Zaineb , Ben Hamed. Mouna, Lassaad. Sbita ' Wireless control for an induction motor' to discuss the development of wireless structure control of an induction motor scalar drives. This was realized up on the wireless wifi networkes.

Ayodele Sunday Oluwole , Temitope Adefarati , Kehinde Olusyi , Adedayo Babarinde , Ezea Hillary ' Design of automatic gate control using infrared remote with password protected features' to Infrared or wireless technology provides an alternate, more portable, more independent means of accessing, opening and closing of a and other electronic information. This research examines how user can open and close the gate with using of IR control.

Trupti S Bobade , Anushri S. sathiskar , Anushri S. Garud , U. W. Kaware , R.K. Dehankar ' Induction motor speed control using android applications' to proposed system designed to controlling the speed of induction motor using android applications where the remotely controlling the speed of induction motor is achieved.

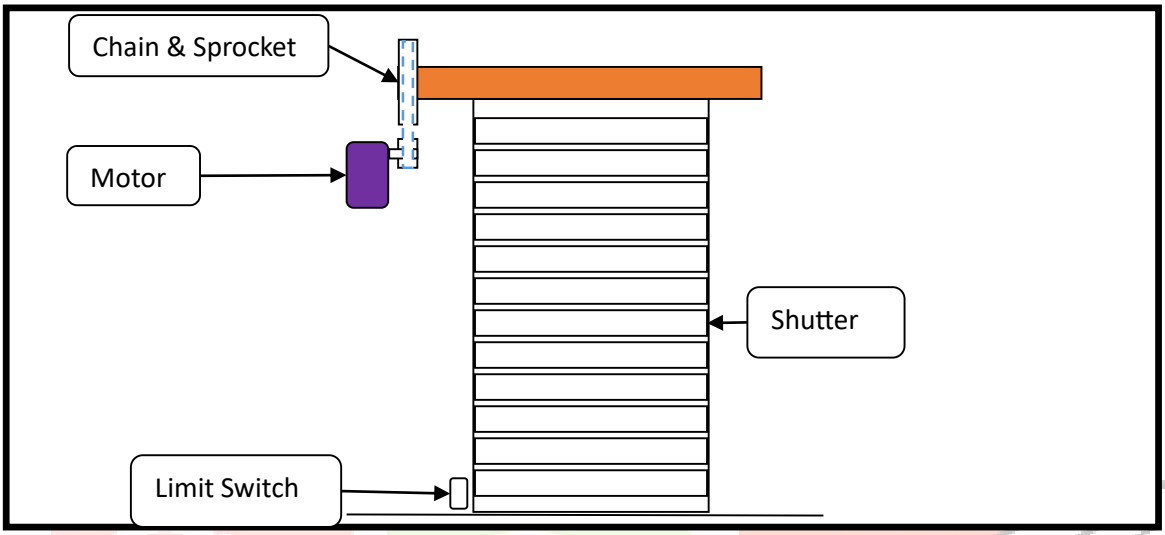
T. Appa Rao , Madhu Kumari , Mayank Kumar , Manoranjan Gopal Priya 'Thyristor controlled power of induction motor by IR remote' The speed control scheme design and implementation of speed control of induction motor through infrared receiver remote is presented. This design is used to control AC power of the different load by using firing angle control by thyristor.

Dokhe Anitha Dattatraya , N.D.Kapale , D.N.Kyatanavar ' Gesture recognition-based AC motor speed control' to the experimental results are highly encouraging as the system is able to produces real-time responses and accurate recognition towards various set of gestures to performing the respective task

PARTS USED IN THE PROJECT

- Motor: 12vdc,
- Limit switch
- Power supply: 12vdc, 3amp
- Square pipe: 1 inch
- Chain and chain sprocket
- Bearing

DIAGRAM OF THE PROJECT



WORKING OF THE PROJECT:

A roller shutter, roller door or sectional overhead door is a type of door or window shutter consisting of many horizontal slats (or sometimes bars or web system) hinged together. The door is raised to open it and lowered to close it. On large doors, the action may be motorized. It provides protection against wind and rain. In shutter firm, it is used in front of a window and protects the window form vandalism and burglary attempts.

which can facilitate the opening and closing of shutter by the press of the button and thus reduce the back injuries. Thus it is important to design such mechanism for safety purpose. In this project keeping in mind those problems, we have designed Gear Motor system assembly to automate the Rolling shutter operation that can provide safety to the operator

DESIGN CONSIDERATION OF THE PROJECT

Project design may be defined as the iterative decision-making activity to create a plan or plans by which the available resources are converted, preferably optimally, into systems, processes or devices to perform the desired functions and to meet human needs. In fact project design has been defined in many ways but the simplest ways to define project design as

"An iterative decision-making process to conceive and implement optimum systems to solve society's problems and needs."

Project design is practical in nature and must be concerned with physical reliability, or economic and financial feasibility Design is essentially a decision-making process. If we have a problem, we need to design a solution. In other words, to design is to formulate a plan to satisfy a particular need and to create something with a physical reality.

BASIC CONCEPT OF PROJECT DESIGN:

Decision making comes in every stage of design. Consider two cars of different makes. They may both be reasonable cars and serve the same purpose but the designs are different. The designers consider different factors and come to certain conclusions leading to an optimum design. Market survey gives an indication of what people want. Existing norms play an important role. Once a critical decision is made, the rest of the design features follow. For example, once we decide the engine capacity, the shape and size, then the subsequent course of the design would follow. A bad decision leads to a bad design and a bad product.

TYPES OF PROJECT DESIGN:

There may be several types of design such as

1. Adaptive design

This is based on existing design, for example, standard products or systems adopted for a new application. Conveyor belts, control system of projects and mechanisms or haulage systems are some of the examples where existing design systems are adapted for a particular use.

2. Developmental designs

Here we start with an existing design but finally a modified design is obtained. A new model of a car is a typical example of a developmental design.

3. New design

This type of design is an entirely new one but based on existing scientific principles. No scientific invention is involved but requires creative thinking to solve a problem. Examples of this type of design may include designing a small vehicle for transportation of men and material on board a ship or in a desert. Some research activity may be necessary.

FACTORS TO BE CONSIDERED IN PROJECT DESIGN

There are many factors to be considered while attacking a design problem. In many cases these are a common-sense approach to solving a problem. Some of these factors are as follows:

(a) What device or mechanism to be used? This would decide the relative arrangement of the constituent elements.
(b) Material
(c) Forces on the elements
(d) Size, shape and space requirements. The final weight of the product is also a major concern.
(e) The method of manufacturing the components and their assembly.
(f) How will it operate?
(g) Reliability and safety aspects
(h) Inspectibility
(i) Maintenance, cost and aesthetics of the designed product.

WHAT DEVICE OR MECHANISM TO BE USED:

This is best judged by understanding the problem thoroughly. Sometimes a particular function can be achieved by a number of means or by using different mechanisms and the designer has to decide which one is most effective under the circumstances. A rough design or layout diagram may be made to crystallize the thoughts regarding the relative arrangement of the elements.

1. Material:

This is a very important aspect of any design. A wrong choice of material may lead to failure, over or undersized product or expensive items. The choice of materials is thus dependent on suitable properties of the material for each component, their suitability of fabrication or manufacture and the cost.

2. Load:

The external loads cause internal stresses in the elements and these stresses must be determined accurately since these will be used in determining the component size. Loading may be due to:

i) Energy transmission by a project member.
ii) Dead weight.

iii) Inertial forces.
iv) Thermal effects.
v) Frictional forces.

PRODUCT DEVELOPMENT PROCESS

A product development has to go through the following concepts of product engineering which are given as under.

- Product functions
- Product specifications
- Conceptual design
- Ergonomics and aesthetics
- Standards
- Detailed design
- Prototype development
- Testing
- Simulation
- Design for manufacture
- Design for assembly
- Drafting

ADVANTAGES OF THE PROJECT

Advantages of the project as per following like as:

- To reduce man power
- To increase the efficiency of man power
- To reduce the work load
- To reduce the fatigue of workers

DISADVANTAGES OF THE PROJECT

Dis-advantages of the project as per following like as:

- This type machine to initial costing higher.

APPLICATION OF THE PROJECT

Our project should use for following various applications like as:

- Close and open the large door

FUTURE SCOPE

Future applications for PIR door sensors used in anti-theft security systems are quite promising. There are several security uses for the PIR door sensor, which can detect motion and changes in heat signatures. These systems have the potential to be integrated with other systems or smart home gadgets, making it simpler to keep an eye on and manage security. PIR door sensors can be used in industrial settings to track the movement of people and equipment, as well as in retail establishments to look out for suspicious behaviour. PIR door sensors can be used in healthcare institutions to monitor entry to sensitive areas and transportation systems to increase passenger safety. The potential for anti-theft security systems using PIR door sensors in the future is positive and provides opportunity for a variety of businesses.

CONCLUSION

The proposed Arduino-based security system, which incorporates a PIR sensor, door sensor, buzzer, and Bluetooth module, is a practical and affordable method of installing smart security systems in homes and businesses. The system is able to identify potential security breaches, notify users in real-time, and provide remote monitoring and control via a computer or mobile device. It offers a trustworthy and user-friendly security solution that can be expanded and customised to the user's needs.

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