



## AUTOMATIC GARAGE DOOR OPENER

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**ABSTRACT**

Direct current motor is an important drive configuration for many applications across a wide range of powers and speed. It have variable characteristics and used extensively in variable-speed drives in any or both direction i.e. clockwise and anti-clockwise. The goal of this project is to make a sustainable modification to the garage door in order to reduce the human effort while their opening and closing and also to increase the safety of the garages. This modification is not limited to only garage door but it can be applied to several doors which are of the sliding and rolling nature.

After this modification the doors can be opened can closed at the swipe of a card or a finger print scanning.

With the application of this modification the doors are tend to be more secure and in case of any chances of robbery the proper installed alarm can be triggered through an electrical impulse sent over to be installed alarm at the nearest security station.

This modification is not only sustainable but is also cost effective as a whole new door and supporting system are not installed. Rather customizable standard modifications are designed to be installed with existing doors in order to make them operational as well as more secure.

**KEYWORDS :****1. INTRODUCTION**

In this product the professional undergraduate students of an esteemed institution have decided to not only identify some of the most common problems but also to find a suitable most cost effective and user friendly solution to these problems.

**The motto of this project was to solve the following circumstances:**

- Opening and closing of the garage doors as well as any other sliding or rolling door with human effort.
- The human effort can be supported to be reduced by application of some mechanical assemblage of gears but even they were not very helpful.
- In case of any robbery the security lies entirely on the noise occurring due to the practice of wrecking the locks and doors that may be heard by the security in-charge if in suitable audible range of the noise.
- Installation of existing automatic doors in the market are not only expensive at the outlet but they also require a hefty amount of capital and constructional changes to be made to be able to be installed and they also result in generation of wastage of existing door assemblies.

The one and only most common solution for all the above problems was to design and develop an electro-mechanical arrangement that can not only be customized as the requirement of the user but is also cost effective and that can be easily installed on in co-ordination with existing doors by any person who has some garage skills such as drilling of holes, connecting electrical wires and application of welding machine.

With installation of this project not only the human effort is reduced but also the doors are tend to be more secure and in case of any chances of robbery the proper installed alarm can be triggered through an electrical impulse sent over to an installed alarm at the nearest security station.

**2. THE PROJECT**

This project aims to develop a combination electro-mechanical parts which work together as a whole and can be easily installed in co-ordination with existing sliding or rolling doors of garages or shops all across the globe and can be operated with minimum human effort that too for only increasing the security to a higher level as the entry and exit shall both will be controlled by an electromagnetic card or biometric sensor operated by a specified personnel's thumb print which are unique in nature.

**This project will be having following parts/ machineries/ devices in order to work successfully:**

- An electric motor
- A commanding sensor
- Electrical wiring
- Existing sliding or rolling door
- Electrical power source
- Suitable supporting clamps

All the above parts can be purchased easily across any market whereas suitable supporting clamps can be easily designed and manufactured in an equipped garage that is fully capable of manufacturing parts as per the user requirements.

According to **"Applications of variable speed drive (VSD) in electrical motors energy savings"**

'Most motors are designed to operate at a constant speed and provide a constant output; however, modern technology requires different speeds in many applications where electric motors are used. A variable speed drive (VSD) is a device that regulates the speed and rotational force, or output torque of mechanical equipment. Effects of applying VSDs are in both productivity improvements and energy savings in pumps, fans, compressors and other equipment. Variable speed drive technology and the importance of controlling the speed of existing motors have fascinated many attentions in the last years with the advent of new

power devices and magnetic materials. This paper is a comprehensive review on applications of VSD in electrical motors energy savings. The aim is to identify energy saving opportunities and incorporated costs of applying variable speed drives to the existing applications of electrical motors. Subsequently, economic analysis, payback period and the effect of current and voltage harmonics generated by VSDs are presented. Authors are hopeful to provide useful information for future variable speed drive applications like fans, pumps, chillers, ventilators and heaters.'

According to "**Bilgihan, A., Karadag, E., Cobanoglu, C. & Okumus, and F. Research Note: Biometric Technology Applications and Trends in Hotels. FIU Hospitality Review in 2013**"

'The biometrics technologies adopted by hotels and the perception of hotel managers toward biometric technology applications. A descriptive, cross sectional survey was developed based on extensive review of literature and expert opinions. The population for this survey was property level executive managers in the U.S. hotels. Members of American Hotel and Lodging Association (AHLA) were selected as the target population for this study. The most frequent use of biometric technology is by hotel employees in the form of fingerprint scanning. Cost still seems to be one of the major barriers to adoption of biometric technology applications. The findings of this study showed that there definitely is a future in using biometric technology applications in hotels in the future, however, according to hoteliers; neither guests nor hoteliers are ready for it fully.'

According to "**Rahul Hooda & Sahil Gupta CSE, PEC University of Technology India, India**"

A brief review of 'Fuzzy Vault', which is a biometric template security technique. The advent of technology over the last decade has established biometric identification as an electronic equivalent to physical verification. Biometric traits offer a reliable solution to the problem of user authentication in identity management systems. Biometric based authentication has more advantage over traditional method such as password due to their uniqueness and required physical attendance at the time of authentication. But there are increasing concerns about the security and privacy of biometric technology. Fingerprint Identification is the most commonly used in biometric systems and fuzzy vault is a new technique to secure the template. The aim of this paper is to review all the important developments in fuzzy vault till.

In this project the commanding sensor or simply the electronic device which will read the signal from electro-magnetic card or thumb print off of a specified personnel's thumb print can simply be called as sensor herein; will be fully responsible for controlling the opening and closing of the doors after the installation of the project in coagulation with the existing door.

The entry to the room or exit from it can be either through swiping the card in front of the sensor or by feeding the specified thumb print into the biometric scanner; whichever level of security that had been opted at the time of installation of the project (product as a whole).

According to "**Silicon Nanowires: A Review on Aspects of their Growth and their Electrical Properties by Volker Schmidt, Joerg V. Wittemann, Stephan Senz, Ulrich Gösele**"

'This paper summarizes some of the essential aspects of silicon-nanowire growth and of their electrical properties. In the first part, a brief description of the different growth techniques is given, though the general focus of this work is on chemical vapor deposition of silicon nanowires. The advantages and disadvantages of the different catalyst materials for silicon-wire growth are discussed at length. Thereafter, in the second part, three thermodynamic aspects of silicon-wire growth via the vapor-liquid-solid mechanism are

presented and discussed. These are the expansion of the base of epitaxially grown Si wires, a stability criterion regarding the surface tension of the catalyst droplet, and the consequences of the Gibbs-Thomson effect for the silicon wire growth velocity. The third part is dedicated to the electrical properties of silicon nanowires. First, different silicon nanowire doping techniques are discussed. Attention is then focused on the diameter dependence of dopant ionization and the influence of interface trap states on the charge carrier density in silicon nanowires. It is concluded by a section on charge carrier mobility and mobility measurements.'

Modern non-metallic sheathed cables, such as (US and Canadian) Types NMB and NMC, consist of two to four wires covered with thermoplastic insulation, plus a bare wire for grounding (bonding), surrounded by a flexible plastic jacket. Some versions wrap the individual conductors in paper before the plastic jacket is applied.

Special versions of non-metallic sheathed cables, such as US Type UF, are designed for direct underground burial (often with separate mechanical protection) or exterior use where exposure to ultraviolet radiation (UV) is a possibility. These cables differ in having a moisture-resistant construction, lacking paper or other absorbent fillers, and being formulated for UV resistance.

Rubber-like synthetic polymer insulation is used in industrial cables and power cables installed underground because of its superior moisture resistance.

Since this project is a product (which comprises of electrical, electronic and mechanical parts) working as a whole it requires the careful connection of wires for the safe and successful working of this project.

According to "**Privacy: A review of the literature by H. Leino-Kilpi, M. Välimäki, T. Dassen, M. Gasull, C. Lemonidou, A. Scott, M. Arndt.**"

'The concept of privacy is used in many disciplines and is recognized as one of the important concepts also in nursing. In this review, a description about the perspectives and dimensions of the concept will be made and empirical studies in the area will be analyzed. Perspectives include units experiencing privacy, desired-achieved state, and reactivity. Dimensions are divided into physical, psychological, social and informational. In the empirical studies, the concept of the privacy has mainly been studied in hospital organizations using the physical dimension. The concept needs further clarification in future.'

Doors can be of many types but they can be categories into three most basic categories based on their nature of operation:

- Sliding (Most commonly can be seen elevators)
- Rolling (Most commonly can be found in shops and garages)
- Swinging (most common type and are mostly used in houses, schools, cars, offices etc.)

This project focuses mostly on the first two types as they are the ones which require quite a hefty amount of human effort for their operation.

According to "**Advanced automatic external defibrillator powered by alternative and optionally multiple electrical power sources and a new business method for single use AED distribution and refurbishment.**"

'An AED being powered by 120/240 VAC electrical power alone, being powered by external DC power alone, or any in combination with or without internal-integral battery power, and further an AED access service business method for sales of access to AEDs. The inventive AED, in addition to the defibrillator circuitry comprises a long, tangle free power access cord to be plugged into an external source of AC or DC power and optionally, additional sets of body

surface and alternative electrodes positioned in the esophagus and/or heart. The AED has additional advanced capabilities including the ability to deliver rapid sequential shocks through one or more sets of patient electrodes, and the optional mode of shock delivery whereby the shock is delayed while the AED continues to analyze the patients ECG waveform and delays the defibrillation shock or sequence of shocks until the ECG analysis indicates conditions are optimum for successful defibrillation.'

In this project the power source opted was a simple 12 volt D.C. battery since this project is a prototype. Whereas during the real life application of this project the normal house hold power source i.e., 240V A.C. supply can be utilized.

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