MODEL OF AUTOMATIC KNOCKING PNEUMATIC DOOR

1. ABSTRACT

Automatic Pneumatic door serves to automate and make easy your door operation mechanism by using Pneumatic cylinder and vibration sensor (vibration detecting sensor). There are many mechanisms fabricated to automate sliding doors but this mechanism can be used to automate swing doors Such Automatic swing doors effectively contribute to energy saving. Since automatic doors can be opened without the utilization of hands, they provide convenience to everybody even with baggage in hand or carrying a cart. This automatic swing door opening system also helps physically disabled people and old people by allowing them to enter easily. It consists of door attached with pneumatic cylinders, vibrator sensors, solenoid valve and supporting frame. The compressed air from the compressor is used as a force medium for this operation On knocking, the vibration sensor senses the vibration and the door opens automatically. Wheelchair users no longer need to rely on others to enter and exit buildings. This pneumatic door opening system makes them easy to enter as normal people do.

2. INTRODUCTION

- Automation, as defined by the Automation Federation, is 'the creation and application of technology to monitor and control the production and delivery of products and services.'

- With respect to doors, Automation is generally reserved for two purposes, accommodating high flows of pedestrian traffic and providing accessibility for people with disabilities. In this chapter, we will briefly discuss the various fields incorporated in our project, objectives, motivation, the work schedule and the organization of the report The automatic pneumatic door consists of a sliding mechanism which is pneumatically operated, uses IR proximity sensors to serve as input and a microcontroller to provide the required logic. The project incorporates the various fieldst viz., Pneumaticst Microcontrollers, Sensor Technology and Carpentry, to ensure smooth and hassle free door operation.
- Pneumatics is a branch of technology that deals with the study and application of pressurized gas to effect mechanical motion.

- In this system a centrally located and electrically powered compressor is used that powers cylinders and other pneumatic devices through solenoid valves,
- A microcontroller is a small computer on a single integrated circuit containing a processor core, memory, and programmable input/output peripherals. An infrared proximity sensor is a sensor able to detect the presence.

3. MAKING OF THE AUTOMATIC KNOCKING PNEUMATIC DOOR

3.1.1. WOODEN FRAME

The wooden frames are made up six different wood pieces which are initially cut into approximate length and planned to get a smooth and parallel surface. The four pieces are joined in such a way that it forms a rectangular shape in order to accommodate two doors. Two more pieces of wood are used as stand so that the door frame can be clamped inside it and the door doesn‟t topple. The four frames are joined together using four dovetail joints. Then glue and nails are used to clamp the joints together and increase the strength of the dovetail joints.

3.1.2 SLIDING DOOR

The doors are made in such a dimension that it suits the wooden frame slot. The door is made of plywood according to the required dimension. Glass sliding channels (E- channels) are fixed in the inner side of the rectangular frame using nails so that the plywood sheets can easily slide on them.

3.1.3 SUPPORTING FARME

Supporting frame is made of steel. Supporting frame is used to support the wooden frame/door.

3.1.4. MOUNTING OF THE CYLINDER

The door consists of a fixed part and a movable part. The pneumatic cylinder is mounted on the fixed part using bolts and nuts. The piston is clamped to the movable part using a 2 inch L clamp and using suitable dimension of nuts and bolts. By clamping this movable part of the door moves according to the movement of the piston i.e. the door closes when the piston expands and the door closes when the piston retracts.

3.1.5 MOUNTING OF VIBRATOR SENSOR

There is vibrator sensor. Function of vibrator sensor is to detect the vibration and gives the signals to microcontroller.

3.1.6 MOUNTING OF MICROCONTROLLER UNIT

A microcontroller is a small computer on a single integrated circuit containing a processing core, Memory, and programmable input/output peripherals.

3.1.7 Assembly

All the parts are Assembled and testing carried out.

4. CONCLUSION

- The objective of this project was to design and fabricate an automatic pneumatic door using sensors. Pneumatic systems provide motive power in a cheaper, safer, more flexible, and more reliable way than the orthodox electric motors and actuators. We have designed a pneumatically operated automatic door using sensors and microcontroller
- The door will open whenever the person will knock three times on door.

5. REFERANCE

- https://nevonproiects.com/mechanical-engineering-proiects/.
- https://www.electronicshub.org/automatic-door-opener-usingarduino/tt ":text=An%20Automatic%20Door%20Opener%20System,malls%2C%20cinemas%2C %20hospitals%20etc.