

Vacuum Cleaning And Mopping Machine

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Abstract -Cleaning is an advancement of inhale dust on the surface of any object or wall. Nowadays dust cleaning is a tedious task in many of the industry especially for the food processing Industries which are the milk, oil, soft drinks, chocolate etc., while cleaning the ceiling there may be a possibility of dust falling into the products which may cause the serious issue in the quality control. If it is not observed during quality test and reached to the consumer it also affects the marketing of that product. Hence the cleaning process in food processing industry is important. The conventional automatic cleaning robot already exists, but this robot does not work in sync with humans and this robot not clean the stairs. This machine can work in any of two modes that is "Automatic and Manual". In this Vacuum Cleaning and mopping machine IR Sensor is used. To overcome all the drawbacks an automated cobweb cleaner is designed. In this paper, design and implementation of automated cobweb cleaner is presented. Vacuum pump is use to collect the dust from the floor. Operates on 5V DC Signal. The hole circuitry is connected with 12V battery. Water pump is use to pump the water on the floor. It operates on 5V DC from microcontroller.

Index Terms – Direct current (DC), Infrared Sensor (IR Sensor), Voltage (V)

I. INTRODUCTION

Cleaning is Important work approximate every place. Sometimes this is easy and sometimes difficult. Sometimes we assigned people for purpose of cleaning and pay money and sometimes cleaning is required in areas where presence of living being dangerous so we cannot assign living being in every place. Some places are so that have a large floor area in that place for cleaning purpose we need more than one person so we required some technique to compensate these problems. In advancement of science a robot come in light but it operates by personnel. To avoid this limitation of personnel we require more technologies. Automation is a great solution of this problem. "Automatic and manual vacuum cleaning machine" has been designed for consumer, office environments, colleges, hotels & restaurants. Proposed design is being operated in dual modes. In one of the modes, the machine is automatic as well as manual and making decisions on the basis of the outputs of infrared proximity sensors. In manual mode, the machine can also be used to clean a specific area of a room by operating it manually. In the present-day scenario, all the members of family are busy with their work and are not getting proper time to clean the house. The cleaning machine helps to clean and mop the floor. This is done by simply pressing a switch and the machine does the work. This also cuts down the labour used in factories for cleaning floor. Above being the case, motivated for the design and development of an automatic cleaning and mopping machine that does all the cleaning and mopping work with a simple press of a button. This machine can be controlled automatic and manually with the help of a mobile Bluetooth. The main moto of the project is to make this affordable and suitable for the Indian users and factories. The development of the machine starts with the design of a simple and most effective chassis for the machine which is a very important part as it has to carry all the weight on the machine. The electronics part where, the type of motor and its specification that should be used to run the bot, the sensors to be used, the microcontroller, the motor drivers, the wheels and other electronic components to be used on the machine are decided. Further, the assembling of the components will be done and finally testing calibrating the device. Vacuum robots required weekly maintenances, Expensive compared to other models, perform average only on soft floors and carpets, this can easily strike up in the clutter of wire and threads if any this all disadvantages overcome by vacuum cleaning and mopping machine.

II. LITERATURE SURVEY

Floor cleaning robot may be a trending concept in these recent days. By reviewing different paperwork and techniques of used several cleaning robots, we've started acting on our design of floor cleaning robot which is predicated on Raspberry Pi 3 model. The papers surveyed for literature review are as follows:

Aishwarya Pardeshi et. al, [1] This paper presents the look, developed and fabricated model of programmed cleaner robot. this type of robot performs automated function with extra features like choose and place mechanism and dirt container with air vacuum mechanism. this type of labor is straightforward and helpful in betterment of life variety of a mankind.

Karthick et. al, [2] is intended to create up an autonomous automatic robot which will move itself without constant human instruction. The autonomous cleanser robot involves low power consuming electric components and it can operate at very low power. Electric parts are the controller board Atmega 2560, Ultrasonic detectors, transformer IC and motor driver circuit. Mechanized part is motor unit with gearbox founded. Ultrasonic detectors will identify obstructions in line with the program being executed. A 12V, 4.5Ah rechargeable lead acid electrical device is that the energy source for this proposed cleaning automatic robot.

III. WORK

All type of hardware and software are controlled by microcontroller. This floor cleaner machine can perform sweeping and mopping task. Subject machine operates in automatic mode as well as in manual mode along with additional features like scheduling for specific time and bag less dirt container without-dirt disposal mechanism. This work can be very useful in improving life style of mankind.

IV. MECHANICAL DESIGN OF MACHINE

Mechanical body consists of following parts

1. Chassis
2. Motor wheel System
3. Vacuum cleaning

1. Chassis

The purpose of the chassis is to bear the weight of the machine in its ideal and dynamic states. The material used to construct chassis include carbon steel for strength and wood to achieve a more lightweight construction. Chassis frame is the basic frame work of the automobile it supports all the parts of automobile attached to it. In our system chassis work as to carry all the stationary loads attach to it. Also withstand torsional vibration cause by the movement of Machine. It is the back bone of the system.

2. Motor Wheel System

The complete product is a four-wheel drive automation process. 4 wheels are independently connected to 4 different 12v DC motors. In motor wheel provide greater control of wheel dynamics especially with a motor at each wheel. Wheel allow heavy objects to be moved easily facilitating movement or transportation while supporting a load, or performing labor in machines. The purpose of the wheels is

1. To give the bot proper motion.
2. Provide traction in all sorts of surfaces.
3. Make the movement easier in all direction.
4. Not to slip of from its path.

3. Vacuum cleaning

Dry vacuum pump is the process to clean the dust particles from the surface so that the load will be lessen for the purpose of other operation. Vacuum cleaning used to remove dirt and dust from carpets, velveteen, furniture and floors made of hard wood and many floors. They are also used to clean the stairs. This process is achieved by using a 12v DC vacuum pump. The inlet is divided into a number of holes so that dust all over the width can be sucked. In mechanical vacuum pumps the mechanism is so designed that air or liquid is sucked from closed area and being thrown to atmosphere.

V. BLOCK DIAGRAM

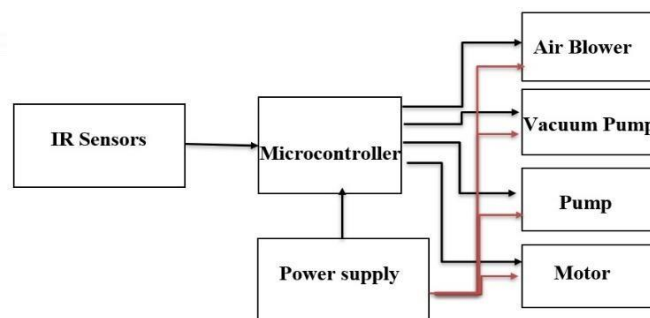


Fig- Vacuum Cleaning and Mopping Machine

VII. CONCLUSIONS

This project demonstrated for vacuum cleaning floor and cobweb cleaner. To overcome the vacuum cleaners' drawbacks while cleaning the wall ceiling the proposed method is efficient and reduces the man power, consumes less time reduces the accident during cleaning process. Machine cleaning is proper compared to the manual cleaning. In the proposed cleaner Collecting the dust is simple. Hence it is concluded that the proposed system is efficient in cleaning. To further enhance the navigation performance of the machine, feedback sensors such as optical encoders can be integrated. Cleaner brushes can be added to vacuum cleaning mechanism to increase the efficiency of dust collecting. Lithium polymer batteries can be used to reduce the weight of the machine which can further lead to the reduction of power consumption. There are so many cleaning and mopping robots present in the market but only some of them are affordable and economic. There are very fewer robots that include both cleaning and mopping. With this work, we tried to reduce the cost of the machine and make it more compatible with the Indian Users and the Industries.

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