

MULTI FUNCTIONAL FLOOR CLEANING MACHINE

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ABSTRACT

Cleaning is necessary for daily routine process. Therefore the aim of our project is to design a model of floor cleaner, it is very much useful in cleaning floors in hospital, houses, auditorium, shops, etc. The main intension of our project work is to design and develop a machine which can clean the dry as well as the wet floors easily. The construction of our project is so simple and easy so that a illiterate person can also be able to operate this machine so easily. The main parts or the construction of our project contains parts like mop, drier, spraying system, vacuum cleaner, bluetooth module such as arduino, sensors for immediate breakdown, battery, etc. The time taken for cleaning is very less cost is also less as well as maintenance cost is less. With the advancement of technology of floor cleaning machine the life of mankind improved, easy, comfortable

KEYWORDS

Floor Cleaner, Floor Vacuum Cleaner, Scrub , Mopping Machine, Floor Scrubbing Machine, Floor Fan Machine, Sprayer, Drier, Floor Cleaner Machine Using With Bluetooth Module, Automatic Controller Phone Use Floor Cleaning Machine, Cleaning Machine, Multiple Use Floor Cleaning Machine.

INTRODUCTION

In modern days, mankind is indicated the use of machines in day-to-day activities which significantly reduce the time and effort required. Floor cleaning has always been most time-consuming and boring work as it is done manually. To overcome this trouble, multi functional floor cleaning machines can be utilized efficiently. We are designing and fabrication project of cleaning machine. Our project's aim is to reduce the human and time for the floor cleaning in houses, bus station, railway station, malls and or any large area. In this project more than one operation of cleaning simultaneously. In which Vacuum of dust or dirt particals, Spraying cleaner liquid and water, moping, drying the floors and room freshning of the room. This machine is controlled by Bluetooth module operate with mobile phones. There are many machines to be used to achieve this but as a result, the cost of doing so gets very high. Moreover, the particular construction is not affordable by many people as more specialized machines were needed. It's construction is simple and easy to operate. In this machine BO rotating mechanism is used in mop for which is rotating the mop. We use many motors to rotate the mop and run the project. We use spraying system in many components. This project is cost effective and clean more space in less time. Its maintenance cost is also low. It is more user-friendly to everyone, relatively affordable, extremely useful, require lesser effort and has satisfactory work output.

ACKNOWLEDGEMENT

Feel great in presenting the report of our project "MULTIFUNCTIONAL FLOOR CLEANING MACHINE" which finds application in much modern equipment and system, this project is done in (Bachelor of Mechanical Engineering) course. We are grateful to our Head of Department for sharing wonderful and enriching experience. We are thankful to our guide, Internal faculty for offering his guidance to us in carrying out this project work. We would like to thank him for providing us with their valuable time and helpful suggestions. He also helped us by providing constructive ideas throughout the tenure of this work. Finally we want to thanks our friends also who helped us providing necessary information related to our project.

OBJECTIVE OF THE PROJECT

- ❖ Easy and quick cleaning.
- ❖ Reduce human efforts.
- ❖ Save the time.
- ❖ Reduce the cost.
- ❖ Delightful the floor.
- ❖ Remove all stains dirt.
- ❖ Reduce the cleaning time by 1/4th at the present.

PROCESS OF MAKING PROTOTYPE MODEL

First of all we had prepared a fabrication structure, for that first of all we done marking according to the required size. After the collect the all parts and tools we are built a safe and high strength base. In this base we are install a all system like a dryer, vacuum cleaner, freshener, water tank etc. We are a making or buy a mope. A mop is a piece of cloth or other absorbent material, attached to a pole or stick. After a selection of a mope we are using a water supply system in our project. In this mechanism we are a with the help of container and pipe, valve and nozzle these are components with help built a water supply mechanism. This mechanism is a installed centre of the body or base. In our project in front side we are a install a small vacuum cleaner so this cleaner is a collect a dust and dirt on the surfaces. This vacuum cleaner is a easy to collect the dust and dirt. In rainy season we are attach a button or system.

With the help of this system we are a run the vacuum cleaner. In a last position we are a install a air freshener and dryer. So with this two equipment help we easy and quickly dry the room and fresh or clean the room air. In rainy season dryer is mostly use to dry the surfaces. In this machine, to run the vehicle and perform the operation of the project 8 DC motors are used. Which are controlled by the controller. In this project 4 wheels are used. Which are connected by motor through controller. Wheels material includes cast iron, plastic, rubber, stainless steel, aluminium, and so on. After the collection all parts with the help of tool we are install all the system or equipment. And complete or make a completely multifunctional floor cleaning machine.

COMPONENTS OF MACHINE & MATERIALS

SR NO.	NAME OF PARTS
1.	Vacuum Cleaner
2.	Cleaner Spraying
3.	Mop
4.	Ro Water pipes and Room Freshener Tank
5.	Drier
6.	Johnson Geared DC Motors
7.	Bo motor
8.	Submersible pump
9.	Controller
10.	Proximity sensor
11.	Wheels
12.	HC-05 Bluetooth module
13.	Cables
14.	L298N Motor driver module
15.	Lithium ion battery

Vacuum Cleaner :-

Vacuum cleaner is defined as a device which produces suction in order to remove debris from the floor, ceiling or any other surfaces. Vacuum cleaner is also simply known as vacuum. Generally all types of vacuum are of electrically driven.



Mop :-

A mop is made up of so many pieces of clothes, sponges or bundle of strings or any other materials which are good absorbent of fluids, which are tied together or attached to a long stick or pole or any sliding mechanism.

Then it is used to soak water or any types of liquids as well as to clean up the small dust particles from different types of surface for cleaning the surfaces.



Cleaner Spraying :-

It is spray system of cleaner for cleaning after the suck up the dust. We will use pump system for the spraying of cleaner. It's design is easy.



RO Water Pipe and Room Freshener Tank :-

A water tank is defined as a container or a hollow cylinder which is used for storing water. Water tanks are use in so many ways to store the water and use that water as per the requirement. Tanks are of so many types which are used for different applications such as to store water, chemical containers, oil containers, gas containers etc...Tank is used for collect the liquid. In this machine Tank is used for collect water and room freshener liquid. It is connected to Mop and room freshener sprayer with pipes.



Drier :-

Drier is used for the drying the floor after the moping. Blower is connected with the motor. DC motor is used for the drier. Drier is simple in design.



Bo Motor :-

DC motor (BO) Battery Operation. DC motor converts electrical energy into mechanical energy. Why DC gear motor used in robot Motor control circuit. Speed of motor is counted in terms of RPM.



Johnson Geared DC Motors :-

The Johnson geared motor is prominent for its compact size and massive torque. A torque as much as tripal as compared to center shaft or side shaft geared motor. DC Motors is an electrical machine that utilizes electric power resulting In mechanical power output. In this machine, to run the vehicle and perform the operation of the project 8 DC motors are used. Which are controlled by the controller.



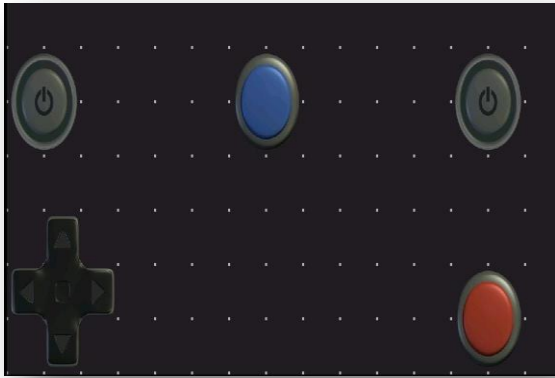
Submersible Pump :-

We have used two submersible pumps to spray water and cleaning liquid. This pump is easy to operate and light in weight. Pump is a device which is used to moves fluids or something else which is in liquid state or slurry. A pump is used to convert electrical energy into hydraulic energy by mean of mechanical actions. The different applications of pumps are water supply, gasoline supply, flood control, marine services etc.



Controller :-

Controller is a part which is control the operation of machine. In which spraying operation, moping operation, Drying Operation and Room freshening operation are controlled by the Mobile phones controller.



Wheels :-

Main object of wheels to easy rolling movement of the project. In this project 4 wheels are used. Which are connected by motor through controller. Wheels material includes cast iron, plastic, rubber, stainless steel, aluminium, and so on.



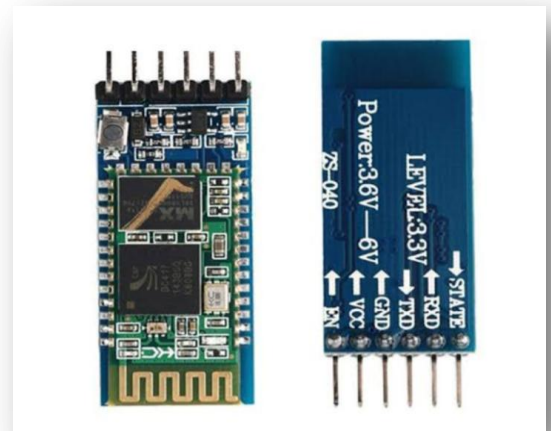
Proximity Sensor :-

A proximity sensor is a sensor able to recognize the presence of close by objects without any physical contact. A proximity sensor frequently emits an electromagnetic field of electromagnetic radiation, and searches for changes in the field or bring signal back.



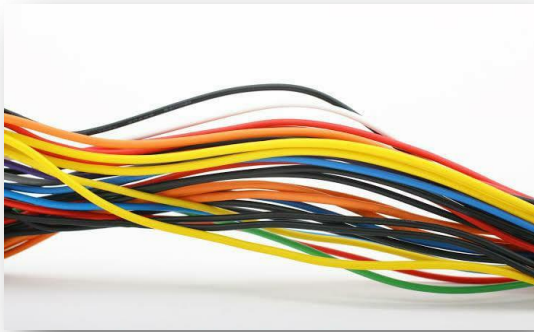
HC-05 Bluetooth module :-

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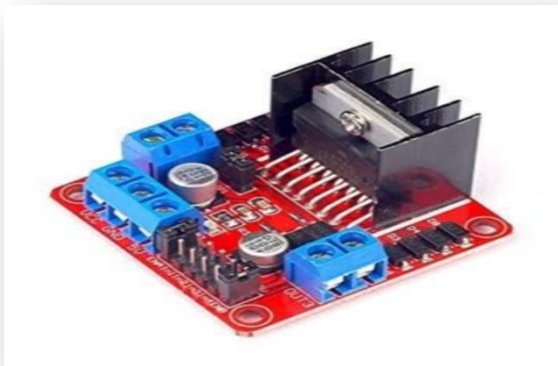
Cables :-

It is made up of group of wires which are covered by rubber or plastic or in other words cable is a thick wire, which is used to carry electricity or electrical signals from one place to another and use it as per the requirement.



L298N Motor driver module :-

L298N Motor Driver Module is a powerful engine driver module for driving DC type and Stepper Motors. L298N Module can control up to Four DC motors, or Two DC motors with directional and speed control.



Lithium ion battery :-

*We have used lithium-ion rechargeable battery(2000mah*3). This battery powers the different motor and pumps. In this project we made Li Ion 2000mAh Cell Rechargeable 11.1V Battery Pack.*

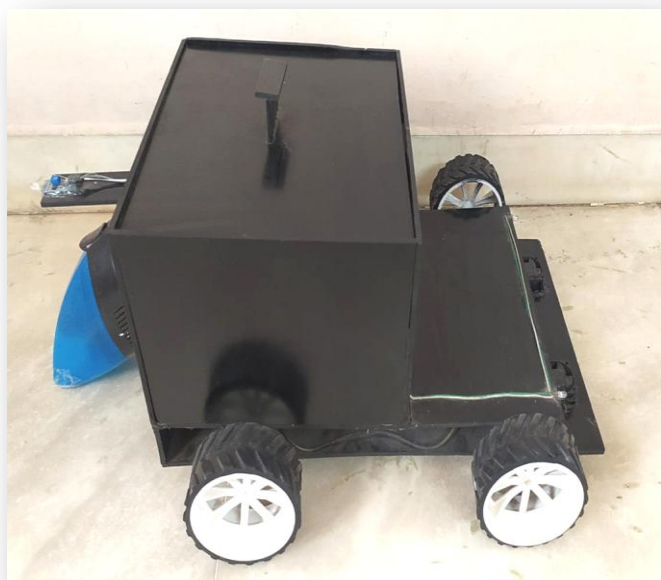
WORKING PRINCIPLE

The Multi functional floor cleaning machine is used for cleaning the floor with low human effort and less time. This machine works on rotating mops mechanism and Spraying Principles. Rotating mops mechanism used to clean the floor and spraying principles used to spray the cleaner liquid and water on the floor. Rotating mops mechanism are run by the BO type DC motors. When motor is rotate then the mop is Rotating. All DC motors, BO motor, vacuum cleaner, sprayer, and dryers systems are attached with Bluetooth module. Bluetooth module is run by any smart phones.

WORKING OF PROJECT

By using battery we supply current to the machine. The main supply from battery and is supplied to vacuum cleaner and operate the motors which plays a main role in cleaning operation. This Machine is run by the four gear motor attached with the wheels. At most initial point the vacuum cleaner is to start and collect the dust and dirt from the surfaces. Then cleaner liquid and water are spray from the sprayer and after that two mops are rotating by BO motors. Water is coming from water tank with the help of submersible pump and control valve is also provided to control the flow of water. After the moping, drier blower is drying the wet floor. Drier is run by DC type Motor. After the completing of all this operation the last remaining Operation is to spread the room freshener in all over the room. All operations are controlled by the controller.

This working of our project is very easy and also easy to use or operate. For monsoon season we make slightly changes in our project because in this season the dust and dirt are in wet form or not dry. So we attached a separate button to operate the vacuum cleaner separately. Because in monsoon season almost all the surfaces are wet and so we are not using the vacuum cleaner because by sucking wet mixture of dust and dirt the vacuum cleaner can be damaged or get failure, so the vacuum cleaner will be operated by a separate button. In the middle and bottom part of the water tank we put a valve, by using this valve we will spray more quantity of mixture and at the same time by using mop the wet surface will be cleaned and at the last we attached a small dryer which will immediately makes the wet surface dry by blowing air.



ADVANTAGES

- ❖ Cleaning, polishing and drying can be done at same time.
- ❖ Manual effort is reduced.
- ❖ Takes time is less.
- ❖ Design is very simple.
- ❖ Less maintenance.
- ❖ More than one cleaning duties can be achieving at a single time.
- ❖ Cost is low.
- ❖ It takes less space.
- ❖ By further modification the drive will be fully automatic.

APPLICATIONS OF MULTI FUNCTIONAL FLOOR CLEANING MACHINE

- ❖ Houses- To clean the floor surface.
- ❖ Hospitals- Used in hospitals for both wet and dry cleaning. In order to obtain hygienic surface.
- ❖ Computer centers- To keep up the ideal cleaning surface finish.
- ❖ Colleges- It is for the most part used to clean the residue which is collected on the surface.
- ❖ Railway station- On the platform of the railway station it can be used in any seasons.
- ❖ Malls

Future scope of this Machine

The future scope of this machine is a fully autonomous cleaning machine which could perform several tasks and run on various ecofriendly power like solar energy without use of lithium ion batteries.

Conclusion :-

Thus in our project we have designed the multi functional floor cleaning machine with the help of battery & D.C. motor which gives desired output. The multiple applications provide in a wide range. This machine is designed in order to reduced the time taken for cleaning and as well as the cost is also very less. This is capable of performing cleaning of floor is comes effectively by semi-automatic water sprays as well as wet cleaning task. Overall our project is completely successfully & will define the next startup until the best one and it also improve the life style of mankind.

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