

DESIGN AND FABRICATION OF AUTOMATIC SWEEPING MACHINE

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Abstract: Programmed floor cleaner is a computerized machine that works with the client to keep their place spotless and sterile. Numerous enterprises are working in the robotization field to make independent cleaners. This paper manages the improvement of programmed floor cleaner. Presently a day's significant accentuation is given on the field of mechanical technology for diminishing human endeavors. This floor cleaning machine is designed by keeping the basic considerations for reduction in cost and efforts while being environmental friendly and easy to handle. The machine will work on electricity and will consist of simple fabrication. This work can be very useful to improve the life style of mankind. For its expense decrease and effortlessness, we are utilizing Arduino. The cleaner will be a stage for giving agreeable life by settling issues in conventional floor cleaning techniques.

Keywords: Semi-automated, floor cleaning machine, dry and wet cleaning, reduction in cost and efforts, electricity, simple fabrication.

INTRODUCTION

For cleaning the houses, workplaces, roads, ventures we for the most part utilize the brush. However, by utilizing brush some medical problem can happen like skin infection, back torment and so forth. It likewise requires more humanity power also time. Henceforth now in present days as innovation is filling in each field, we likewise use robots for cleaning reason. Be that as it may, cleaning robots are expensive and just some of them give office of cleaning as well as wet cleaning. In India for houses cleaning robots are not utilized on the grounds that a typical individual can't bear the cost of it because of significant expense. In India, robots are utilized for road cleaning, rail route station and air terminal cleaning which are controlled physically. In this paper, we are planning a completely programmed floor more clean. This is equipped for wet cleaning as well as dry cleaning. In this, we additionally use UV light for microorganism disinfection by which we can keep away from corrosive or other dangerous fluid. For planning of room, we utilize different innovation. However, here we use IR sensor for edge identification and snag discovery. In this project we likewise use Arduino UNO microcontroller. By this task, we attempted to decrease the expense of cleaning robot as contrast and other wiping robots.

- ❖ Obstacle avoidance
- ❖ Floor avoidance
- ❖ Collision Detection
- ❖ Dry cleaning
- ❖ Wet cleaning
- ❖ Status display
- ❖ Automatic system

OBJECTIVE

- ✚ Objective of this project is to make semi automated floor cleaning machine.
- ✚ Reduce the overall cost.
- ✚ Reduce human effort.
- ✚ To increase the effectiveness of floor cleaning.

LITERATURE REVIEW

✚ Akash Nagtode(2017)

“Solar operated floor cleaning machine. He had made a project on cleaning system based on solar power. For this he has used Pv panel which convert particle of energy (photons) into electricity. He use this clean energy to power his cleaning machine”

✚ M Ranjit Kumar (2016)

“The regular floor cleaning machines is most generally utilized as a part of airplane terminal stages, railroad stages, healing centers, transport stands, and shopping centers and in numerous other business places. These gadgets require an electrical vitality for its activity and not easy to use. In India, particularly in summer, there is control emergency and the vast majority of the floor cleaning machine isn't utilized successfully because of this issue, especially in transport stands. In this work, demonstrating and investigation of the floor cleaning machine was finished utilizing appropriate financially accessible programming. From the limited component investigation, we watch that the feeling of anxiety in the physically worked floor cleaning machine is inside as far as possible”

✦ Sandeep. J. Meshram Et Al [2016]

“Design and Development of Tricycle Operated Street Cleaning Machine” – He has developed the street cleaning machine by tricycle operated. In this research article .He framed a model especially for rural area. He concluded that the cleaning is less effective in streets”

✦ Mohsen Azadbakht Etal [2014]

“Design and fabrication of a tractor powered leaves collector machine equipped with suction-blower system”- “The authors explained about the fabrication of leaves collector machine by tractor powered blower. He has frame the machine by using chassis, pump, blower, gearbox, hydraulic jack. They concluded total power consumption of that machine is around 14634 W which can cover up to 20m range in distance.

✦ Manreet Kaur[2014]

“Design and fabrication of floor cleaner robot (manual and automatic).the author designed a robot to clean floor in both automatic mode as well as manual mode. His robot was equipped with IR sensors for obstacle detection, four motors and water pump .He concluded with convenience of dual mode operation of easy floor cleaning”.

✦ Manyajain, Pankaj Singh Rawat (2016)

“This project is used for domestic and industrial purpose to clean the surface automatically. When it is turned on, it sucks in the dust by moving all around the surface (floor or any other area) as it passes over it.In the modern era, the automatic floor cleaner is required. Thus, the cleaner is designed in such a way that it is capable of cleaning the area reducing the human effort just by starting the cleaning unit”.

✦ Sahil Bharti, S.R. Sandhave(2016)

“To develop an automated cleaning assistance this helps in cleaning flat surface with the ease of remote control with greater efficiency at work. The surface cleaning machine that is proposed in this project is the device that helps in cleaning of surface. There are many function that have to co-ordinate for the motion control”.

✦ Dr. J. Hameed Hussian(2017)

“This module of automatic floor cleaning machine by micro controller is run to clean the floor and sweeps the dust away. In this the module a remote controlled car has gear motor is attached at front axis in between the front wheels , this motor is attached with a cleaning brush at front , and the gear motor is connected to 12volts battery and the remote car is attached with 9volts battery. The remote car is controlled by the micro controller”

CRITICAL REVIEW

Various authors have done various things with floor cleaning machine from automising it completely to making it ecofriendly and easy to use. Some have robotised the process by using of AI and some have used custom fabrication to fit various needs of cleaning like wet or dry cleaning. But one thing in common with all machines was the goal to reduce the overall cost and increase the ease of using the machine in multipurpose ways. In future the scope is a fully autonomous cleaning machine which could perform several cleaning tasks and run on various ecofriendly power like solar or wind energy without need of human interventions.

PROJECT DETAILS

Project construction is simple and effective .the construction and operation cost is less compared to other product available in market. The machine is very easy to use. The machine consists of following parts:

✦ Custom chassis with wheels

It is the back bone of the system. All the systems and parts are attached to it. The solidity of the system is greatly affected by the chassis.



Figure.1

✦ Motor

A gear motor is an all-in-one combinational of a motor and gearbox the addition of a gear head to a motor reduces the speed while increasing the torque.



Figure.2

Arduino uno

The Arduino uno is a microcontroller board based on the ATmega328. It has 20 digital input/output pins of which 6 can be used as analog inputs. A 16MHz resonator, a USB connection, a power jack, and in-circuit system programming (ICSP) header and a reset button.



Figure.3

Battery

18650 Lithium Ion battery is a single cell compact and powerful battery cell with 2500 mah capacity. This Li-ion battery is very convenient to install in your project where 3.7 volt with high capacity is needed.



Figure.4

Roller

Foam roller will produce the smoothest finish, light medium textured surfaces.



Figure.5

Wiper

Floor cleaning mop with wiper your floors helps to create a more sanitary environment but it also can give your floors an impressive shine.



Figure.6

Bluetooth

HC -05 is a bluetooth module which is designed for wireless communication. This module can be used in a master or slave configuration.

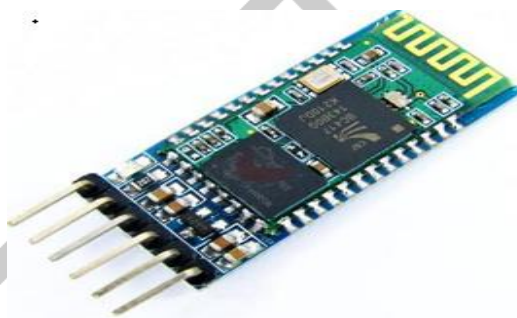


Figure.7

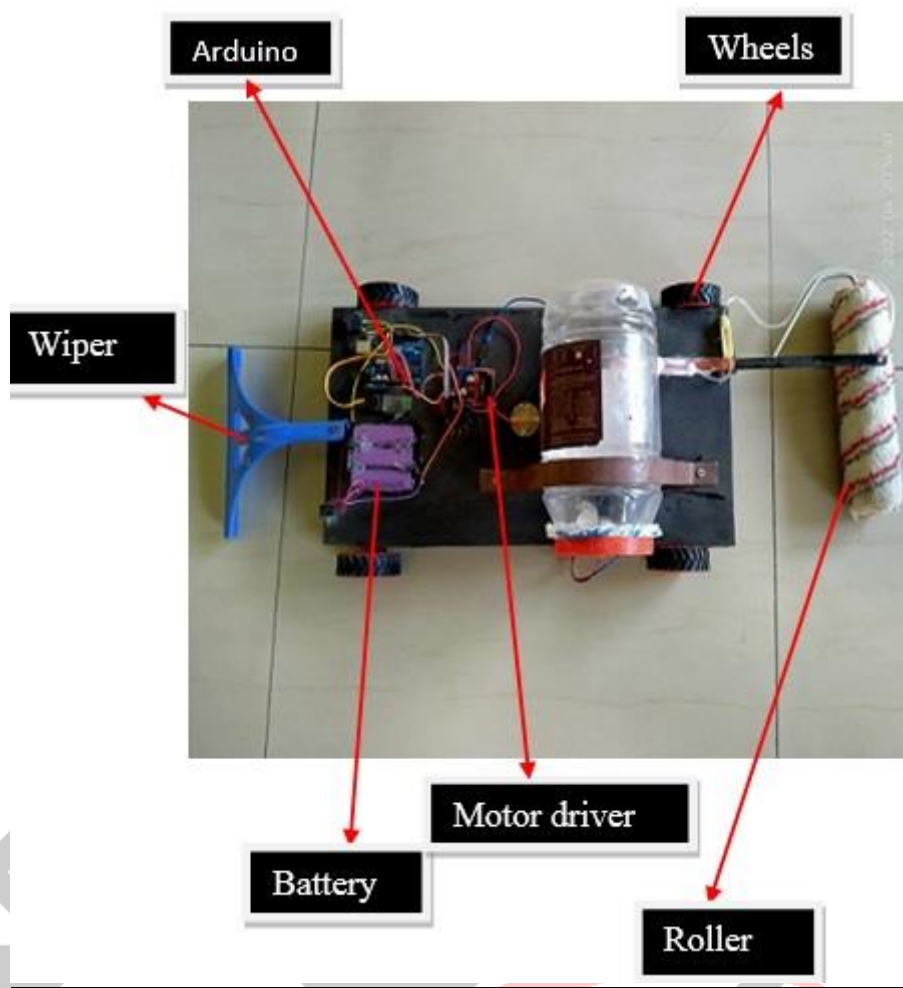
Solder wire

Solder wire is conductive alloy substance with low melting point. Used in the electronics industry to electrically connect component together.



Figure.8

FINAL PROJECT PICTURE



CAST ESTIMATION

Sr.No	Name of the component Used	Quantity	Rate of the component
1	Arduino Uno	1	790 Rs
2	L298N Motor Driver	1	150 Rs
3	12v DC Motor	1	170 Rs
4	2500mAh Battery,Holder	6,6	564 Rs
5	Wheel	4	140 Rs
6	100rpm Gear Motor	4	260 Rs
7	Bluetooth Module HC05	1	450 Rs
8	Jumper Wire, Simple Wire	11	60 Rs
9	Pump	1	65 Rs
10	Joystick	2	150 Rs
11	Pully	1	25 Rs
12	Body Sheet	1	150 Rs
13	Wipper,Roller	1,1	250 Rs
14	Glue gun and Stick	1	250 Rs
15	Box	1	30 Rs
16	Pipe	1	90 Rs

Total Cost- 3544 Rs



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