

SMART SWEEP SYSTEM

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ABSTRACT

The Households of today are becoming smarter and more automated thanks to the growing technology. This project describes a smart sweep system which allows cleaning of floor by giving instruction to the robot. This smart system makes floor cleaning easy and fast. This is a wireless system that works using an android mobile application which allows the system to follow commands given by the user through the app. This smart system consists of a Wi-Fi microchip ESP8266, a motor driver IC, Relay & water pump. On receiving command through the app using Wi-Fi module the system will achieve the desired path and direction. The main objective of this smart sweep system is to make wet cleaning of floor easy by using technology.

Keywords: Motor driver IC, Wi-Fi module ESP8266, Relay.

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I. INTRODUCTION

Now a day in this growing generation and continuously developing society technology has taken place to reduce human efforts. The fast and growing technology have made human works easy, simple and have reduced man power. In today's world technology has step into our houses and have made our daily chores easy and less time consuming. In this project we have aimed at the wet cleaning of the floor using technology. The traditional ways of wet cleaning of floor required human effort and is much time consuming. In this project we have made a Smart Sweep System which is designed for the wet cleaning of floor easily using a phone application. This is a device which when operated by the phone application by the user will move around the given area and thus cleaning the floor. The mechanical design includes ESP8266 microchip, DC motor driver water pump, tank, etc. The device is easy to use and simple to operate without requiring much human interference in cleaning of the floor.

II. RELATED WORK

M. Ranjit Kumar, N. Kapilan (2) have purposed a manually operated floor cleaning machine alternative for automated floor cleaning machines during power crises. Introduced a Pedal operated body to achieve dry and wet cleaning.

Automated floor cleaning machines are now a days used in developing countries from last few years because of high cost of time, efforts, labor and their affordability. The concept is not much popular in developing economic countries.

Reasons for non-popularity are cost of machine and operational charges in terms of power tariff writes Vardhaman Ladage and Shardool Jawanjal. They have introduced a Semi-automatic floor cleaning machine which machine is run by microcontroller to clean the floor and sweep the dust away. In this module the remote-control car has gear motor attached at its front with cleaning brushes. The remote-control car is controlled by the microcontroller.

Prof. K. P. Maity writes Automatic floor cleaner is a system which enables cleaning of the floor with the help of highly stabilized and rapidly functionalized mechanical and electronic control system. Have introduced the DESIGN AND FABRICATION OF AUTOMATIC FLOOR CLEANER Designed a compact floor cleaner which can be used in household. The machine sucks dry debris from the floor, uses sprinkler water to wet the floor then scrubs over the floor. The complete system is carried out automatically throughout the floor of any kind of room.

III. BLOCK DIAGRAM

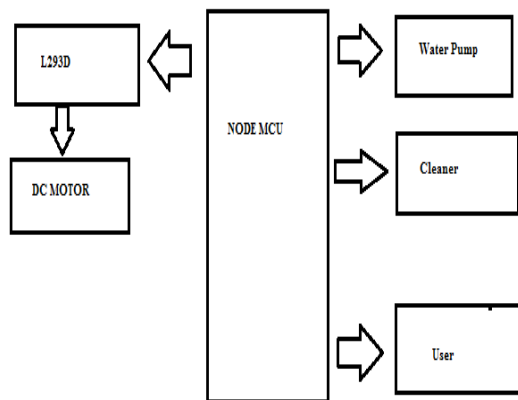
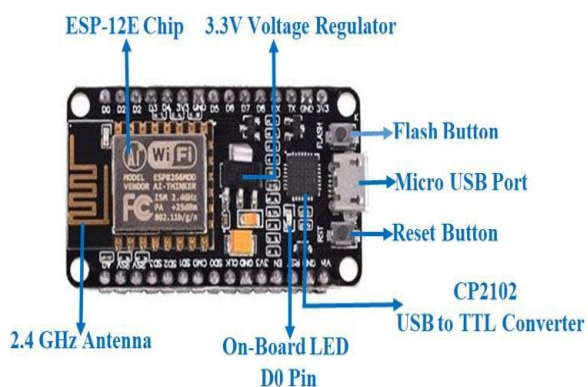


Fig 1. Block Diagram

Working Method

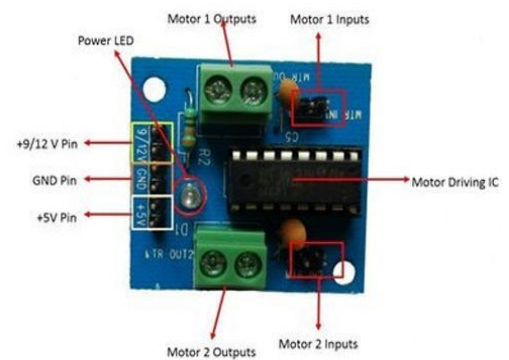
NODE MCU ESP8266 which is a Wi-Fi enabled microchip SoC (system on chip) is connected to a motor driver. The motor driver IC allows DC motor to drive on any direction. Here the DC motor is used to move the system in various direction such as forward and backward. Wi-Fi module is used to control the device using an android mobile application. Water pump will circulate the liquid to the cleaner. The cleaner is mounted on the chassis and will move around the surface making the floor clean and dust free.

NODE MCU ESP8266



The NodeMCU (Node Micro Controller Unit) is an open-source hardware and software development environment built around an inexpensive System-on-a-chip (SoC) called the ESP8266. The ESP8266 module, designed and manufactured by Espressif Systems, contains the crucial elements of a computer: CPU, RAM, networking (Wi-Fi), and even a modern operating system and Software Development Kit.

L293D Motor Driver



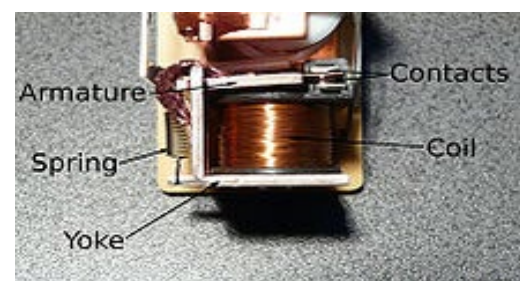
L293D is a typical motor driver IC which allows the DC motor to drive on any direction. It has 16 pins which are used to control a pair of DC motors instantaneously in any direction. This works on a basic principle of H-bridge, this motor control circuit allows the voltage to be flowing in any direction. As we know that the voltage must be change the direction of being able to rotate the DC motor in both directions. Single L293D consists of two H-bridge circuit inside which can rotate 2 DC motors separately.

DC Motor



The DC motor comes under a class of electrical machines where direct current electrical power is converted into mechanical power. Most often, this type of motors relies on forces that magnetic fields produce, the internal part of this is electronic or electromechanical. The direction of current flow in part of the motor changes periodically. The speed of DC motor is controlled using a variable supply voltage or by changing the strength of the current within its field windings.

Relay



An electrical relay is an electrical switch which is operated electromagnetically. This electromechanical switch consists of an electromagnet, a spring, an armature and a set of electrical contacts. A small current is required to create a magnetic field in a coil within a magnetic core which is used to operate a switch that can control much larger current and

enable both the circuits to be electrically isolated from each other.

Water Pump



A 12 volts DC water pump is used which is a electronic device that pressurise the liquid or transports liquid. The pump pushes water on to the surface by converting rotart energy to kinetic energy and then into pressure energy. This is achieved by water being pulled inside the pump, first the intake then the rotation of the impeller pushes water through the diffuser and from the diffuser it flows to the surface.

IV. CONCLUSION

Our thought behind this idea is to make a electronic device which has the concepts of various engineering treads and also wanted to offer this idea to all class of people in our country with efficient and a easy way of cleaning in low cost as much as possible with that of similar intensity the other advance machines provide which are out there available in the market at much high rates.

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