Review on Floor Cleaning Robot

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Abstract- *Manual work is taken over the robot technology and many of the related robot appliances are being used extensively also. Here represents the technology that proposed the working of robot for Floor cleaning. This floor cleaner robot can work in any of two modes i.e. "Automatic and Manual". All hardware and software operations are controlled by Arduino. The aim of this project work is to develop and modernized process for cleaning the floor with wet and dry and also obstacle detection .Usually robots of this kind can cost more making it an unaffordable choice. At the same time this economical robotic floor cleaner has been designed mainly keeping the price margin in mind. As a result, a most efficient and agile cleaning system is developed to attain perfect cleaning rather than satisfactory cleaning achieved by a pre-existing extravagant machine. This project resulted in the outcome of exhaustive research and comparisons with the conventional designs and performances of various kinds and make. Supervisory control over these gadgets is made so simple and cost efficient without reduction in performance. By minimizing human intervention, the newly designed economical robotic floor cleaner paves a new way in innovating inexpensive, at the same time better home appliances. Ease of use and simple interface makes this project a most useful device in this busy and smart world of today. With the aim of keeping our robot as simple as possible, while able to perform the initial goals, i.e. a vacuum cleaner robot able to clean a room or a house with the minimum human assistance.*

Keywords- Arduino, ultrasonic sensor, vacuum, Driver IC, Motors.

I. INTRODUCTION

Manual work is taken over the robot technology and many of the related robot appliances are being used extensively also. Here represents the technology that proposed the working of robot for Floor cleaning. This floor cleaner robot can work in any of two modes i.e. "Automatic and Manual". All hardware and software operations are controlled by Arduino.

This project deals with the designing and fabrication of Floor cleaning Machine. The aim of this project work is to develop and modernized process for cleaning the floor with wet and dry and also Obstacle detection. It is very useful for cleaning the floors. It can be used wet and dry; hence it is widely used in houses, hospitals, auditorium, shops, computer centers, etc. In modern days interior decorations are becoming an important role in our life. Cleaning of floor is a very important one for our health and reduces the man power requirement. Hence our project is very useful in our day to day life.

Floor cleaner is very much useful in cleaning floors in hospitals, houses, auditorium, shops, computer centers etc. It is very simple in construction and easy to operate. Anybody can operate this machine easily. It consist of moisture cotton brush, the brush cleans the floor and dried with aid of small blower. Hence it is very useful in hospitals, houses, etc. The time taken for cleaning is very less and the cost is also very less. Maintenance cost is less. Much type of machines is widely used for this purpose. But they are working under different principles and the cost is also very high.

II. OBJECTIVES AND PROBLEM STATEMENT OF PROJECT

There are four objectives of this project, which is stated in the following texts:

- To achieve simultaneous dry and wet cleaning in a single run.
- To make the machine cost effective.
- To reduce the maintenance cost of manually operated floor cleaning as far as possible.
- To provide a substaintional solution is to the problem of manufacturing cleaner utilizing local resources while keeping it low costs.

Problem Statement

Since there are lots of problems happened during floor cleaning process, like human as well as systematic error may be happened during cleaning of floor. So to clean every Corner of Floor we are designing the robot who can do work regarded cleaning manually as well automatically.

III. BLOCK DIAGRAM

This project deals with the designing and fabrication of floor cleaning robot. The aim of project work is to develop

and modernized process for cleaning. The main objective of this project is to achieve simultaneous dry and wet cleaning in a single run. It is used in houses, hospitals, shops, school, collages, malls, etc. Cleaning of floor is very important one for our health and reduces the man power requirements. This project work in manually and automatic.

All hardware and software operations are controlled by ATmega328/p Arduino. It consist of moisture cotton brush, the brush cleans the floor and dried with the help of blower.
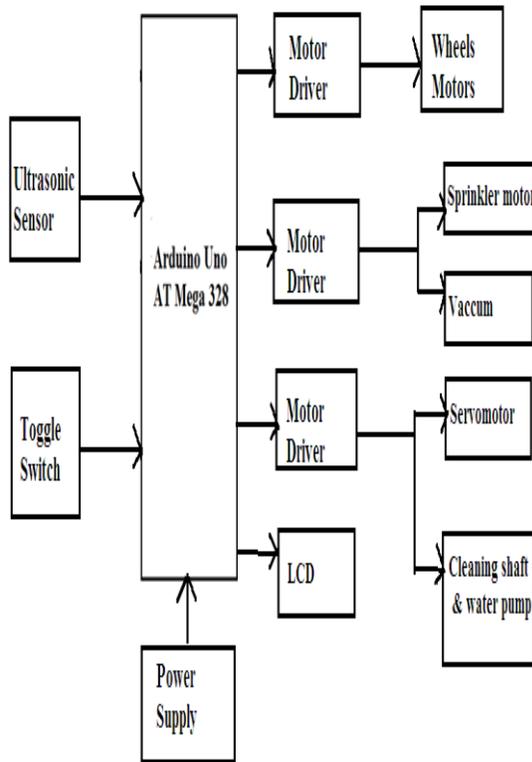

Fig1: Block diagram of floor cleaning robot

Ultrasonic sensors are used for obstacle detection and hence change its direction while moving. This sensor is controlled by Arduino controller and also controls DC motors with the help of driving circuitry. LCD is used for display the forward and reverse directions and also left and right turn.

The floor cleaner is intelligently programmed to clean a specific area through a vacuum cleaning assembly. The cleaner is cost effective and convenient environment friendly. That saves valuable time of any person. This project is a design and fabrication of floor cleaning machine. The aim of this project works is to develop and modernize process for cleaning the floor with wet and dry and also it dos obstacle detection.
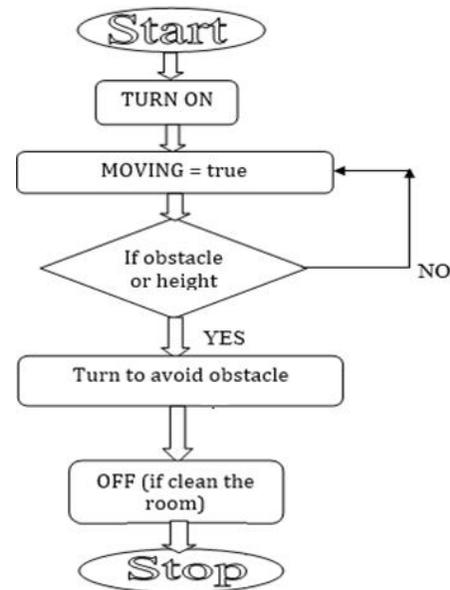

Fig2: Flow chart of floor cleaning robot

Ultrasonic sensor is used to detect the obstacles, if obstacle is detected then it moves back and change its path and other is used to detect the height in order to prevent the cleaner from falling down. If obstacle is not detected then it moves forward direction.

Arduino Uno: The Arduino Uno is a microcontroller board based on the ATmega328P. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. The Uno differs from all preceding boards in that it does not use the FTDI USB-to serial driver chip. Instead, it features the Atmega8U2 programmed as a USB-to serial converter. This board is very simple and can be easily used, everything you need to support the microcontroller is in this board, just plug it in a computer via USB cable and power using an AC-to-DC adapter or battery to get started.
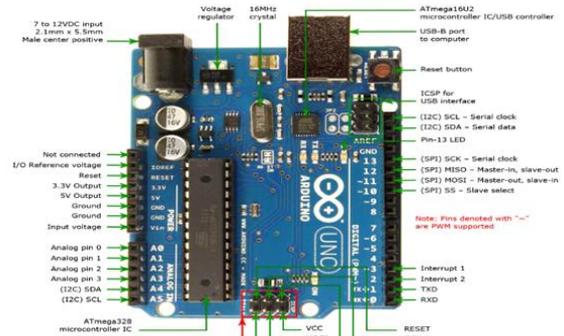

Fig 3: Arduino Uno Board

Ultrasonic Sensor: The HC-SR04 ultrasonic sensor uses sonar to determine distance to an object like bats do. It offers excellent non-contact range detection with high accuracy and stable readings in an easy-to-use package. It operation is not affected by sunlight or black material like Sharp rangefinders are (although acoustically soft materials like cloth can be difficult to detect). It comes complete with ultrasonic transmitter and receiver module.

Fig 4: Ultrasonic Sensor Module

Ultrasonic ranging module HC - SR04 provides 2cm - 400cm non-contact measurement function, the ranging accuracy can reach to 3mm. The modules includes ultrasonic transmitters, receiver and control circuit. The basic principle of work:

Using IO trigger for at least 10us high level signal

(2) The Module automatically sends eight 40 kHz and detect whether there is a pulse signal back.

(3) IF the signal back, through high level , time of high output IO duration is the time from sending ultrasonic to returning.

Test distance =(high level time ×velocity of sound (340M/S) / 2
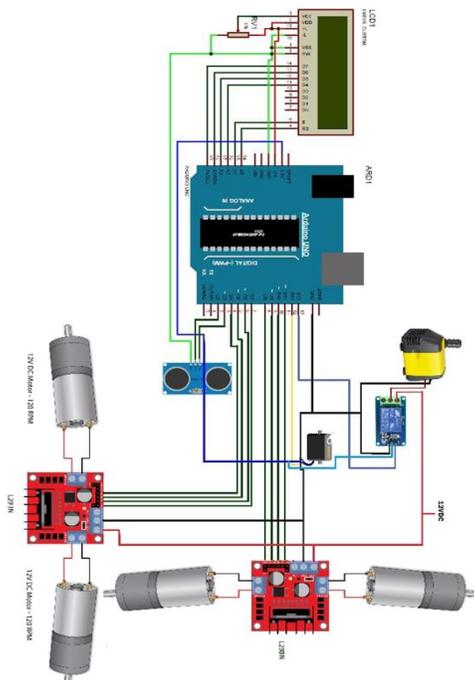
III. SIMULATIONAND OBSERVATIONS

Fig.5: Simulation of our project

The Proteus Design Suite is a proprietary software tool suite used primarily for electronic design automation. The software is used mainly by electronic design engineers and electronic technicians to create electronic schematics and electronic prints for printed circuit boards. It was developed in Yorkshire, England by Lab center Electronics Ltd and is available in English, French, Spanish and Chinese languages.
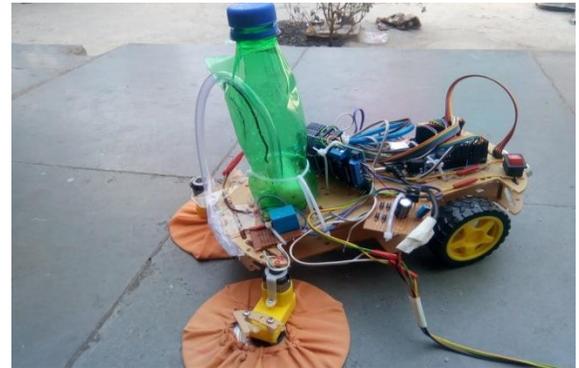

Fig.6: Actual Image of our project

IV.CONCLUSION

A cheaper and user friendly Dry and wet Cleaner robot can be developed with two different mode of controlling (Manual and Autonomous mode) using an Arduino Board with more electronics functionality. Battery monitoring, lighter body weight and to set alarm on/off time manually are the future scope of this project.

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