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ijircce@gmail.com



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FLOOR CLEANING ROBOT

Nishigandha Ramchandra Rotte¹, Vidya Vilas Jadhav², Kiran Khedkar³, Prof. Kiran Khedkar

U.G. Student, Department of Electronics and Telecommunication Engineering, Parvatibai Genba Moze college of Engineering, Wagholi, Pune, Maharashtra, India¹

U.G. Student, Department of Electronics and Telecommunication Engineering, Parvatibai Genba Moze college of Engineering, Wagholi, Pune, Maharashtra, India²

U.G. Student, Department of Electronics and Telecommunication Engineering, Parvatibai Genba Moze college of Engineering, Wagholi, Pune, Maharashtra, India³

Associate Professor, Department of Electronics and Telecommunication Engineering, Parvatibai Genba Moze college of Engineering, Wagholi, Pune, Maharashtra, Engineering, India⁴

ABSTRACT: With the advancement of technology, robots are getting more attention of researchers to make life of mankind comfortable. Floor Cleaning Robot is a compact robotics system which provides floor cleaning services in room ,big offices reducing human labor .Robot can achieve the function of intelligent obstacle avoidance . The aim of this project work is to develop and modernized process for cleaning the floor with wet and dry. This robot can perform sweeping and mopping operation. All hardware and software operations are sensed by IR sensor and robot having range 100m.

I. INTRODUCTION

Recent years, robotic cleaners have taken major attention in robotics research due to their effectiveness in assisting humans in floor cleaning applications at homes, hotels, restaurants, offices,hospitals, workshops, warehouses and universities etc. Basically,robotic cleaners are distinguished Basically,robotic cleaners are distinguished on their cleaning expertise like floor mopping, dry vacuum cleaning etc. Some products are based on simple obstacle avoidance using infrared sensors while some utilize laser mapping technique. Each cleaning and operating mechanism of robotic floor cleaners has its own advantages and disadvantages. For example, robots utilizing laser mapping are relatively faster, less time consuming and energy efficient but costly, while obstacle avoidance based robots are relatively time consuming and less energy efficient due to random cleaning but less costly. The main objective of this work is to provide a substantial solution to the problem of manufacturing robotic cleaner utilizing local resources while keeping it low costs disadvantages

Now day's robots are entering market to reduce human efforts and energy to get accurate work. The purpose of choosing this project is to modern technology as well as reducing human efforts. The robot is an device in which whole program is fed in brain. Robot is an electromechanical machine and used for various purposes in industrial and domestic applications. Robots play an important role in each every field of life. The Robot can perform two operations sweeping and mopping i.e. wet and dry cleaning. It operates on 12V power supply. When we select automatic mode the robot perform all operations itself without human interference. The IR sensor and Ultrasonic sensor are used for obstacle detection and distance measurement. In semi-automatic mode, the robot can perform operation according to human message. In automatic mode, if any obstacle is detected in front of robot then it will stop operation ,change path and resume all operation ,then move in forward direction.

II. METHODOLOGY

The best way to understand how a Hoover might collect debris is to think of each one as a straw. When you drink through a straw, the process of sucking creates negative air pressure inside the device. The ambient pressure outside the straw is lower than this pressure. Similar to how a hole in the spaceship's hull lures passengers into space in space movies, a Hoover creates a negative pressure inside that invites air to flow into it.

Electric motor-Vacuum cleaners use an electric motor that spins a fan, sucking in air – and any small particles caught up in it – and pushing it out the other side, into a bag or a canister, to create the negative pressure. You might think then that after a few seconds it would stop working, since you can only force so much air into a confined space. To solve this, the vacuum has an exhaust port that vents the air out the other side, allowing the motor to continue functioning normally.

However, the air is filtered rather than just passing through and being discharged out the other end. The people using the Hoover would be seriously injured by that. Why? In addition to the filth and grime, a Hoover also gathers extremely small particles that are virtually undetectable to the naked eye. They have the potential to harm the lungs if inhaled in large enough doses. The Hoover cleaner uses at least one fine filter and frequently a HEPA (High Efficiency Particulate Arresting) filter to remove practically all of the dust because not all of these particles are captured by the bag or canister. The air was only recently deemed safe to breathe once more..

The power of a vacuum cleaner is determined not just by the power of its motor, but also the size of the intake port, the part that sucks up the dirt. The smaller the size of the intake, the more suction power is generated, as squeezing the same amount of air through a narrower passage means that the air must move faster. This is the reason that vacuum cleaner attachments with narrow, small entry ports seem to have a much higher suction than a larger one.

Building blocks of the floor-cleaning robot's sensor system It includes an IR sensor, a class of sensor. The obstruction is located using this sensor both when it is stationary and moving. The robot is propelled by DC motors. Because of its superior features, including its 12V power requirement, 600ma output current per channel, 1.1A peak output current, built-in diodes, over-temperature protection, and good noise immunity, the L293D IC is used to drive the wheel motor.

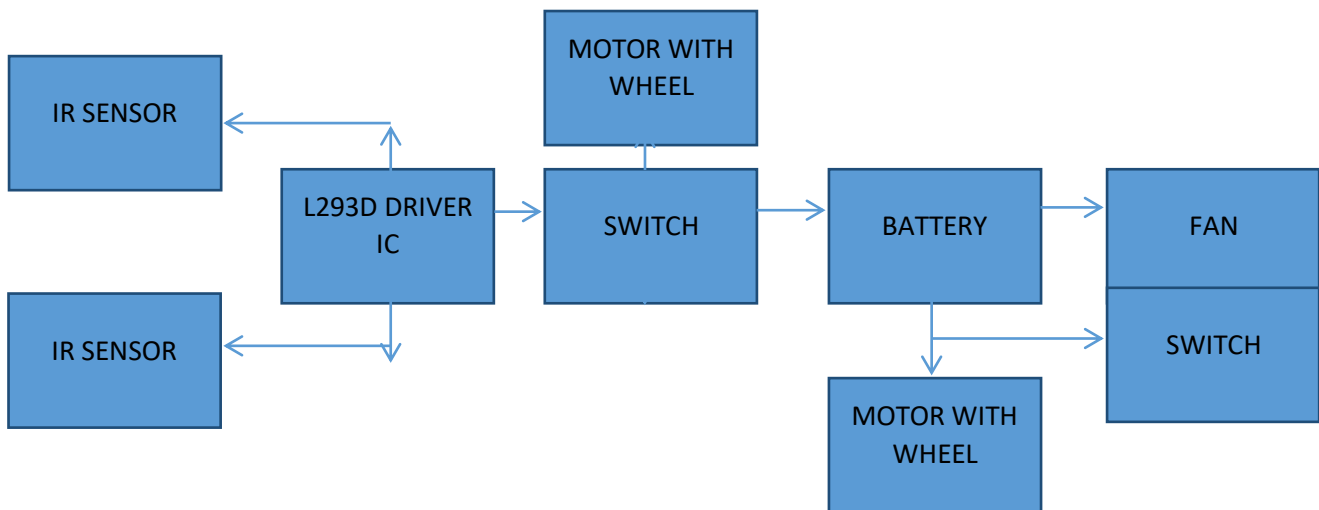


Fig 1:BLOCK DIAGRAM



Fig 2: Hardware Result

III. CONTROLLING

The basic concept of an infrared sensor that is used as an obstacle detector is to transmit an infrared signal. This infrared signal bounces off the surface of an object, and the signal is received at the infrared receiver. The IR sensor used for obstacle detection An IR sensor transmits an infrared signal; this infrared signal strikes the surface of an object that comes in front of it and reflects back, which is received at the infrared receiver. An infrared sensor consists of an infrared source and an infrared detector.

An IR LED or laser diode is typically used as an infrared source. Photodiodes, or phototransistors, are components of an infrared detector. The IR LED emits energy, which is reflected back by a target and lands on the IR detector. The output of an IR sensor is high in the absence of an object and low when an object is detected. The Arduino controller can be directly attached to this output.

IV. RESULT

- This can be used for Low range Mobile Surveillance Devices.
- This can be used for Military Applications (no human intervention).
- The robot can be used for Home automation.

V. CONCLUSION

This study makes it easier to sweep and mop floors in an effective manner. This proposed work offers obstacle detection in the event that anything stands in its way. It would be simple to manage and save time because the floor cleaner is integrated with various devices, including DC motors, IR sensors, etc. This project is designed to help people clean floors quickly and effectively. Cleaning small surface particles by hand is no longer necessary thanks to a simple but effective design, making the task more effective and reasonably quick.

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