



Fabrication of Automatic floor cleaner

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ABSTRACT

The automatic floor cleaner is a system that uses a highly stabilized and fast functionalized electronic and mechanical control system to clean the floor. The current project's goal is to employ an autonomous floor cleaner for large floors in homes and offices. Continuous relative motion between a scrubber and the floor surface is used to achieve the cleaning goal. During the cleaning and moving of the vehicle, a propulsion mechanism such as driven wheels and guide wheels is used for dry tracks on the floor surface to be cleaned, a vacuum pump is used to suction water, and a scrubber directs water towards the back end. For advance sweeping of a debris-laden floor surface, a sweeper mechanism mounted on the body propelled by the propulsion mechanism and operated with such a control system is preferred. The motion of the device is governed by a PID controller, which accepts input from the sensor circuit and transmits it back to the microcontroller, resulting in a synchronized simulation of the wheel. In the future, the new robotic floor cleaner will save a lot of money on manpower. The main benefit of this product is that it will be cost effective and will not require human control. Once turned on, it will clean the entire room without omitting any surfaces.

Keywords: Pressure, Bench Vice, Compressor

1.Introduction

Cleaning is a must-have skill for today's generation. Generally, the floor in a home must be cleaned on a regular basis. Cleaning different types of surfaces requires different procedures. The following are some of the reasons for floor cleaning: • Slips and falls on the floor are a leading cause of accidental injury and death. Accidents are frequently caused by poor floor cleaning practices.

- i) To make the floor more attractive.
- ii) Debris and impediments must be removed.
- iii) Allergens and dust must be eliminated.
- iv) Preventing surface wear
- v) To keep the environment clean (kitchens).
- vi) Traction should be kept at a maximum so that no slippage occurs.

Different techniques are used to clean floors, and they might be of various types. Different types of floors necessitate different treatments. After cleaning, the floor should be completely dry. Otherwise, there is a risk of danger. Sawdust is used to absorb all kinds of liquids on some flooring. As a result, there will be no need to keep them from spilling. Every day, the sawdust must be swept and replaced. This method is still employed in butcher shops, but it was once widespread in taverns. Tea leaves are also used to absorb dirt from carpets and to eliminate odors in specific situations. Different types of floor cleaning devices, such as floor buffers, automatic floor scrubbers, and extractors, are now available that can clean practically any sort of hard or carpeted flooring surface in a fraction of the time that traditional cleaning methods would take. Cleaning would vary depending on the type of flooring

1.1 Wooden Floor: The type of coating on wooden flooring, whether waxed or oiled, or whether it has a polyurethane coating, determines how it is treated. The most important thing to know about this 9 type of floor is what type of coating it has and how to clean it properly. The floor should be removed of all easy-to-move furniture, according to simple cleaning recommendations. 2. Sweeping or vacuuming any loose dirt particles is required. 3.

The floor is mopped in the direction of the grain. If the floors are polyurethane, a mop dipped in water with a few drops of dishwashing solutions is required. Before using the mop on the floor, it should be thoroughly ringed out. 4. Remove soapy filth from the floor by buffing it with a soft cloth. Because they have a high absorbency capacity, the softer the cloth, the better it works.

1.2 Tile or Stone Floors: Most modern homes have tile or marble flooring that is easy to clean. Here are a few examples: 1. Debris particles should be vacuumed or swept away with a broom. 2. For appropriate flooring, a floor cleaning solution should be utilized. If the surface is made of stone, it should only be cleaned with stone-specific solutions. An acidic tile cleaning chemical should be used on ceramic flooring. 3. The floor is scrubbed and cleaned using a mop or scrubber.

1.3 Scrubber: Indian floors are typically cleaned by rubbing them with a firm cloth or a plastic-like material known as a scrubber or mop. As a result, when cleaning Indian flooring, the scrubber design is critical. Depending on the type of material used or the surface to be cleaned, the scrubber's motion on the surface might be rotatory or harmonic. Scrubbers are often made of hard materials such as thick cloths. The scrubber's primary function is to thoroughly clean the surface while also soaking the water or liquid used to clean it. We utilized a scrubber consisting of a cloth wound over a metallic bar in our case (cylindrical rod). The scrubber's other function is to ensure that dirt water flows in the correct direction. In certain circumstances, a single spot will need to be wiped multiple times. Harmonic motion is used for this purpose, which allows for improved debris removal. However, in our situation, the goal is to clean household floors, so the scrubber is rotated relative to the goal.

2.Literature survey

Traditionally, the floor was cleaned by hand with various handcrafted devices. Initially, it was cleansed with various reed brushes. Egyptian dwellings were said to be made of sun-dried mud bricks that were sometimes white-washed, and the floors were stamped dirt. The outdoor kitchen's floor was also made of ground that had been baked stone hard by the sun. These floors were easy to keep clean by sweeping unless it rained, which happened only seldom. These brushes, like most ancient Egyptian tools, did not have long handles, which would have made them easier to use, and therefore required bending low to utilize. Brushes of various designs have evolved for the convenience of humans. During the reign of the monarchs, carpets of various designs were used to cover the floor and keep it clean. As time passes, a new scientific era dawns, and a slew of new floor-cleaning procedures emerge. The reciprocating brush action actuated by muscular force was the first of these. Depending on the floor structure and the ease of cleaning workers, the brush design is adjusted from time to time. Since the invention of electricity, vacuum cleaners have been used to clean dry surfaces. Different floor cleaning equipment are being developed in the future to clean the floor with less bodily effort. Then there was the idea of a mobile robot. Mobile robots may roam around their environment and are not restricted to a single physical area. Industrial robots, on the other hand, are normally stationary, with a jointed arm (multi-linked manipulator) and gripper assembly (or end effector) attached to a fixed surface. 13 During the 1980s, the first floor cleaner was created for the benefit of mankind. The goal of that device was to clean the floor with less power consumption. The sweeping mechanism of the mop is controlled by a dc circuit and operated by a timed motor. Water is sprayed on the mop, and the debris is cleaned off the floor with the wet mop. However, it was discovered that no chemical solvent or disinfection could be used. Again, just hot air is used for soaking. Again, a worker is required to move the machine. To resolve these issues, a current study was conducted to enable the cleaner to travel about any room automatically. The moping process has also been tweaked to save money. In the current study, the mop rotates continually around an axis perpendicular to the cleaner's action, which helps to distribute water on the floor backward. A sprinkle mechanism is used instead of a wet mop to make the floor moist, which is then scrubbed by the mop. A vacuum cleaner was utilized to soak up unclean water from the floor surface and clean it side by side. Mobile robotics is used to move the cleaner automatically. Mobile robots are a major focus of current study, with one or more labs dedicated to the field at almost every major institution. Mobile robots can be found in a variety of applications, including industrial, military, and security. Domestic robots are consumer items that include entertainment robots as well as robots that conduct specific household activities like vacuuming or gardening. Since then, increasingly advanced robots have been built for domestic devices to automate jobs such as washing machines and micro woven. Only then did the mobile robots revolution reach residential applications. The problem with today's automatic floor cleaning equipment is that they're only utilized in homes for dry and wet cleaning, not for removing infections. As a result, it is only utilized in private homes and not in hospitals or small public spaces. Automatic floor mops, such as the hydrobot, are huge, demand a lot of electricity, and are utilized for commercial purposes. But we believe that this (our cleaner) will take care of everything at once... We will primarily focus on a clever, compact, and well-designed robot that can be utilized in a variety of sectors, including healthcare and education (both of which are, of course, small places) as well as in the home. As a result, it will be used for both terminal cleaning, such as medical facilities, and indoor floor cleaning. As an added feature to this equipment, we will focus on indoor air purification in the future..

3.WorkingPriciple

For the cleaning application, the project is totally unified. It includes the necessities for floor cleaning, such as water, scrub, and a fan. It's a wheeled machine with a motorized movement. The wheels and revolving objects for the scrub are driven by multiple AC motors in this floor cleaning machine. The motors' wiring is appropriately built, and the wheels are set up with the help of two dual two-way switches. A pushbutton is also used to turn on and off the rotating scrubbing. Plastic pipes with holes and a gate valve are also designed to control the release of cleaning liquid onto the floor. The machine is connected to its controller through LAN lines, and the controller is also connected to the AC supply. This project can be used for a variety of floor cleaning tasks. The torque required to rotate the bracket is approximately 16 N-M. At 1440 RPM, the motor produces 4.94 N-M. A smaller pulley is

attached to the motor shaft, while a larger pulley is attached to the main shaft, resulting in a reduction in speed to 360 RPM and an increase in torque to 19 N-M. As a result, the motor will run without being loaded. The goal of this project is to create a little floor cleaner that can be used around the house.

The machine's entire procedure begins with the front vacuum pump. It's used to clean up dried material on the floor. This is quite good for reclining surfaces that have a lot of dirt particles on them. The debris that has been vacuumed must be kept in order to be removed later. This is accomplished by attaching a debris chamber to a 12v vacuum pump. The next goal is to wet the surface, which can be accomplished by sprinkling water on the floor. The goal is accomplished with the help of a sprinkler system and a motor. This system has a shower-like outlet and a chamber with a dc motor pump that controls the outlet. To clean the floor, the surface scrubber must move or brush over it. The dirt should be fully eliminated, and the debris-laden water should flow back to the bot's rear. Clamps are used to secure the scrubber to the chassis. One side of the scrubber is attached to the motor, while the other is attached to the ball bearing. The bearing is secured to the chassis by a clamp. A vacuum mechanism is utilized at the back of the system to suck the debris-laden filthy water. This type of pump and chamber are also the same.



4. Motor-Wheel System

This allows you to accomplish more in the same amount of time, if not less, than walking behind a machine. Employee productivity has increased, while production costs have decreased. Because the operator is riding instead of laboring, fatigue is lessened, allowing them to work at a higher pace after they have done cleaning the floor. Creating labor cost reductions. Navigating is easy when riding because they are mechanically pushed.

5. Applications

The floor cleaning machine is widely used in following places:-Hospitals, colleges, Industrial floors, Airports, Offices, Hotels, Commercial Complexes, Dairies, Laboratories, Canteen, Health centers.

6. Conclusion

The automatic floor cleaner is a system that uses a highly stabilized and fast functionalized electronic and mechanical control system to clean the floor. The current project focuses on using a single front wheel to move three wheels to the left, right, front, and back sides. The previous model could only go forward and backward. This is the primary benefit of our project..

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