

Automatic Restroom Cleaner

T. Kannan¹, V. R. Gandhiram², V. Hariharan³, S. Dinesh Kumar^{4*}

¹Assistant Professor, Department of Mechanical Engineering, KPR Institute of Engineering and Technology, Coimbatore, India

^{2,3,4}Student, Dept. of Mechanical Engineering, KPR Institute of Engineering and Technology, Coimbatore, India

*Corresponding author: dineshs18111998@gmail.com

Abstract: In the cutting edge world, the advances are definitely grown, yet at the same time the cleanliness in our nation is under risk. The abstract of this paper is to deliver clean and hygiene toilets. All the public toilets should be clean and hygiene. In our country, our government has introduced the scheme called "Swachh Bharat" (Clean India). Keeping the toilets uncontaminated is the one of the objective of Clean India scheme. This project can be helpful to encourage the clean India project. In future, it can show the major part in clean India scheme. In an Existing system, they are focused only on identifying the dirt in the toilets. In our proposed system, we have determined on keeping clean toilets, observing the sweeper's working activities. It can dodge many syndromes. It may create the consciousness amongst people about the toilet management. Therefore, our development is to use safe and hygienic toilets. This paper is based on IOT and image-processing concepts using different sensors like smell sensor, IR sensor, sonic sensor, RFID reader. By using these sensors, we can create the smart toilets.

Keywords: Smell sensor, IR sensor, Sonic sensor, RFID reader, IoT.

1. Introduction

According to Swachha Bharat Abhiyan. This project will be helpful for cleaning of washrooms where there is no provision of any cleaning assembly so it will be easier to place cleaning assembly with low cost, effective, power optimistic and less maintenance. This project uses rack and pinion arrangement along with washer to clean complete system. Here is another assembly i.e. cleaning of dome with the help of some motors. This system uses high torque motor to clean complete floor. This complete system is power saving system and with the help of limited time it is possible. This system is cost optimistic and with the help of limited source it is possible to maintain all the things. This project will be useful at home, schools, colleges, hospitals, companies, factories and anywhere workplace.

In recent years, Cleaning Machine have taken major attention in research due to their effectiveness in assisting humans in cleaning applications at homes, hotels, restaurants, offices, hospitals, workshops etc. Basically, Cleaning Machine are distinguished on their cleaning expertise like floor mapping, dry vacuum cleaning etc. Each cleaning and operating mechanism of floor cleaning machine has its own advantages and disadvantages. In this work, "Multipurpose Cleaning Machine" have been designed for offices, homes also in collages for their

toilet and bathroom cleaning. In one of the mode this machine is manually or also be automatic and making decisions on the basis of humans are used in this machine. The mechanical design of this including cleaning mechanism, phenol tank, motor with flexible shaft and multi-purpose tool holder etc. The main objective of this project is to provide a high efficiency solution to the problem of manufacturing a machine that should be able to utilizing local resources while keeping it low costs. Manual work is taken over the machine technology and many of the related appliances are being used extensively also. Here represents the technology that proposed the working of machine for toilet and bathroom cleaning.

In the modern era, the Automatic Floor Cleaner is available but today also we have to clean the toilet and bathroom with manually mode also it take large human efforts are 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. In this, main focus is to build a machine in such a way, that it can move around freely and clean a specific area and should compact to handle and to carry. Brushes are attached at its end in order to remove the dust while revolving

1. To achieve simultaneous cleaning in a single run.
2. To make the machine cost effective. Easy to operate.
3. Requires no training to operate/ fast.
4. No battery requires.
5. Lower Maintenance Cost and Time.
6. Required less cleaning time.
7. High Cleaning Capability.
8. Clean more space in less time.
9. To reduce the maintenance cost of the manually operated floor cleaning machine as far as possible.

2. Experimental Setup

The experimental setup is fabricated as shown in Fig. 1 of automatic restroom cleaner. It consists of rack and pinion setup for movement, two dc motors for rotating the pinion, battery for providing power, brushes for cleaning, micro-controller for storing and sending signals for the operation, one infra-red sensor for sensing, a sprinkler for spraying the water and soap solution mixture.

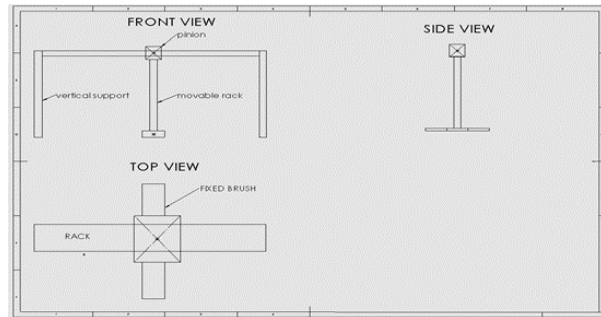


Fig. 1. Experimental set up

3. Working Principle

The automatic washroom cleaner machine uses the Micro-controller, IR Sensor, Battery, Timers, Rack and Pinion gear setup, Brushes. The experimental setup uses the battery for the operations which is to be performed. Initially, when the battery is switched ON, the timer gets activated for the cleaning of washroom closet and floor for those different programming is coded. When the battery gets started the brush setup which is attached to the motor and it rests on the rack and pinion gear setup. It started to move along its directional path which is coded. It uses the IR Sensor for the detection of any obstacles before if it senses the closet door the programming gets next step and activated the vertical movement of the single brush which is in the centre and the remaining brushes rests the same. After the timing gets completed the vertical movement of the brush gets completed and retrieved to its original position and completed the horizontal cleaning of the floor. Once the IR Sensor detected the wall which is opposite the timer program also gets to the reverse or original position. This makes the whole setup to be in the original position.

4. Result and Discussion

The developed fabrication according to the design exhibits the expected results. As per our proposed working condition we are able to clean the restrooms without the help of any external humans involved in cleaning process. With simple mechanical setup arrangements and program, the cleaner will be able to cover large floor areas as well as find its way in and out of small corners. As the cleaner traverses the room, the sweeper installed in it will manage to pick up a significant amount of dirt. The nozzle in this setup gives the high pressurized water and also in the wide spread to large areas. In other hand, Manual Sweeping might not be that effective as it will not be picking up everything in as it is not in sight but using the automatic floor cleaner it can be done easily. The conventional work of the cleaner uses simple and reliable setup's makes this to use in the day-to-day routine life to eliminates the human efforts from cleaning the restrooms. In the current situation, the most of the cleaning companies manufacture's the cleaning machines for

both industrial and housing purpose. But those machines are made for the use of cleaning the floors and vaccuming the place to absorb the dust from the place in industries to clean the working environment. Those machines uses the electricity to clean the surface and the machines are not fully automated which are used in industries for the purpose of cleaning. The housekeeping machines which are in use for cleaning purpose are only used to clean the dust from the floors but those are also not automated any of the housekeeping or the industrial cleaning machines aren't made cleaning restrooms or washrooms. During implications, we have some calculation errors and programming errors by overcoming those errors now we are able to make the restroom cleaner to work in a perfect condition. In these we are able to clean the restrooms in effective manner and now we have attached a small water container which is used for the cleaning.

5. Conclusion

Thus automatic restroom cleaning machine is more efficient and more hygienic way of cleaning a restroom than cleaning it manually. It also prevents the diseases or bacteria from affecting the person involved in the cleaning activity of the restroom.

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