

# Design & Fabrication of Railway Platform Cleaner

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**Abstract-** Due to the rapid growth of advanced technology automation in the various aspects of life, industry, medical, domestic machine etc. we know that there are corners and wall surfaces in buildings, offices, railway station or bus stop which are full of dust and dirt. Cleaning is the standard of our life. The traditional floor or surface cleaning machines can't be able to clean vertical surfaces. Hence, we have need of the automatic wall cleaning machine with less weight and low cost. It consists of brushes which are rotated by motor for ground surface along with vertical surface. It also consists of nozzle by which we can provide water and detergent for cleaning purpose. The main purpose of this machine is to clean the dirty wall surfaces along with flat surface.

**Keywords-** Cleaner, DC motor, Railway Platform, Reciprocating Mechanism, Semi automation.

## I. INTRODUCTION

The main aim of this project is to reduce the cleaning time and manual effort. In Railway platform about 80 to 90% of the dirt is tracked in from outside. Clean more space in less time to reduce the manual effort. There is no machine in the markets which can clean both vertical and flat surface in same time. The traditional floor or surface cleaning machines can't be able to clean vertical surfaces, but our project will help in this department also. In manufacturing we are using simple drive mechanism as possible as and easy to operate, time taken for cleaning is very less and maintenance cost is also less as compared to other. Floor scrubber in a machine capable of cleaning both hard surfaces and smooth surfaces.

The main purpose of this machine is to clean the dirty wall surfaces on railway station, The walls usually get dirty because of dust, dirt and tobacco spitting. Cleaning walls of railway station and bridges is very difficult task, that's why this machine will become very useful. And also, it comes with brushes that are used for scrubbing the floor which allows sticky dirt to loosen up and eventually removed. It is a great alternative to mop and bucket and can enormously cut down the cleaning time. We certainly undergo considerable development from the traditional brooming to vacuuming our floors, and now it's time to clean wall automatically. Modern cleaning equipment permits us to finish our cleaning tasks easier and faster

## II. LITERATURE SURVEY

### Shubham Antapurkar 2020 [1]

He works on Arduino based dry and wet automatic floor cleaner. His aim is to construct a floor cleaner which will be fully automatic providing dry and wet cleaning as well as UV sterilization. The current market is occupied by cleaners with only one or two functionality. For its cost reduction and simplicity, he is using Arduino. The cleaner will be a step for providing comfortable life by resolving problems in traditional floor cleaning methods.

### Ms. R. Abarna et al. 2020[2]

They work on Design and fabrication of automatic floor cleaning machine. Their system enables cleaning of the floor by the help of highly stabilized and rapidly functionalized electronic and mechanical control system. Current project work targets to use automatic floor cleaner for large floor in household purposes and office floors. The cleaning purpose is specifically carried out by continuous relative motion between a scrubber and the floor surface.

### Arjun V Murali et al. 2020 [3]

In their research, they work on floor cleaning machine. Their aim to develop and modernized process for cleaning the floor with wet and dry. At first dust is collected from vacuum cleaner. After that Water is sprayed from water tank and floor cleaning is done by rotating press which is coupled to the DC motor. Fan is used to dry the water which is fitted to the Back side of the vehicle.

### Dr. ShaileshDhomneet.al 2020 [4]

The main aim of this project is that it combines operation of all three different device's operation i.e. vacuum cleaner, dryer & mop. The objective of this machine is to develop and modernized process for cleaning the floor with wet and dry

### Shivam Tilekaret.al 2019 [5]

Made automatic wall cleaning machine with less weight and low cost. It consists of conveyer with brushes which are rotated by motor. It also consists of nozzle by which water and detergent can be provided for cleaning purpose. The main purpose of this machine is to clean the dirty wall surfaces

### III. PROBLEMSTATEMENT



Now days there are many more problems related to room corners and walls, society, staircase corners, railway station, Metro station, Bus stop are not clean when you risk exposing you and your family to allergy-inducing dust particles, mold and other free-floating debris. These problems can also trigger asthma attacks in people who are prone to them. You don't have time to clean these areas. This is the most obvious problem; this can cause some serious health risk. These have some of the highest incidences of illness in the world. Wall surfaces and floors are particularly susceptible to bacteria and other parasites that can enter into the human intestines such as worms. Cleaning them walls regularly is to keep your house clean and hygienic. How to clean painted walls without damaging them?

The walls can get dirty because of dust, dirt and grime. Cleaning your walls can be daunting task. The dirt on the walls can affects health hazards especially folks affected with asthma as reported by the consumer product safety commission(CPSC).

### IV. DESIGNE AND WORKING



To achieve our objectives of our project we are going to design and fabricate automatic machine which mainly consist of parts like brush or scrubber, pump, motor, sponge, nozzles and frame etc. First of all we give the power through electricity to the motor. The brushes and sponges are mounted on shaft and will rotate with the help of motor arrangement. For wall cleaning, when the power is supplied to the motor then it will start and then it will provide the power to 123 reciprocating system with the help of gears arrangement. As the reciprocating motion starts the brush which are mounted on the rod connected in gear also move up & down. Brush will perform motion vertically, so the brushes are coming in the contact with wall.

For floor cleaning we give the power to another motor through electricity. Round brush which is mounted in shaft connected through motor will also rotate according to motor speed. This rotation of brush will help in cleaning of ground.

At the same time water and detergent or chemical mixture is supplied to the contact between brushes and wall through nozzles. When the water and chemical mixture fall on the rotating brush, foam will create, due to the chemical reaction. Then brushes remove the dust as well as the dirt from the wall surface. There is a water pump and detergent pump provided to supply the water and detergent from respective tanks to nozzle through pipes. To mount all these systems, there is a frame is provided with the wheels. Due to that it becomes portable and easily travelled to the required space and completes the work properly with less time and less cost.

### V. CONCLUSION

Manual Cleaning might not be that effective as it will not be cleaning up everything in as it is not in sight but using this cleaning machine it can be done easily. The components are needs to design in order to enable easy operation and to reduce the effort of human beings. Cleaning time depends on the speeds of the motors and the degree of dirtiness of the wall. Finally, this system should be further developed so that it will have more features. In general, the system works adequately as anticipated in the design process.

Our machine is cheaper, compact, portable and easy for the operation as compare others heavy and costly machines of it made. In the market there is no any machine than can clean both vertical and flat surface at same time. So, our project will definitely help people for cleaning, most of the time for the cleaning of public place like our main focus is railway station and bus stop. The main purpose of this

machine is to clean the dirty wall surfaces along with flat surface.

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