

# A Review on “Design and Analysis of Manually Operated Floor Cleaner”

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**Abstract**— The customary floor cleaning machines is most broadly utilized as a part of airplane terminal stages, railroad stages, clinics, transport stands, shopping centers and in numerous other business places. These gadgets require an electrical vitality for its activity and not easy to understand. In India, particularly in summer, there is control emergency and a large portion of the floor cleaning machine isn't utilized adequately because of this issue, especially in transport stands. Henceforth it is a need to grow minimal effort, easy to use floor cleaning machine. In this venture, an exertion has been made to build up a physically worked floor cleaning machine with the goal that it can be an option for traditional floor cleaning machines. In this work, demonstrating and investigation of the floor cleaning machine was finished utilizing appropriate financially accessible programming. The ordinarily utilized materials were considered for the parts of floor cleaning machine. From the limited component examination, we watch that the feeling of anxiety in the physically worked floor cleaning machine is inside as far as possible.

**Key words:** Floor Cleaning Machine, Brush, Powerless, Conventional

## I. INTRODUCTION

Hygiene is most important aspect of a healthy life. Cleanliness may be gifted with a moral quality as indicated by the saying “cleanliness is next to godliness”, and is regarded as contributing to good health and beauty. So it is important to keep the surroundings neat and clean. On a practical level it can be said that cleanliness is related to hygiene and disease prevention. Washing is one method of achieving cleanliness, which is usually performed with water or soap. There are many types of equipment which reduces the efforts of humans in cleaning. There are equipments to clean and equipments to dry, but equipment which performs both the functions is rare. Here comes the scope of the floor cleaning and drying equipment for house hold purpose. The project is to design and fabricate such a machine at low cost for usage in houses.

Fully automatic machines available in the market are of high ranges. So, keeping the focus on cost factor, they are not affordable to all. The organization committee of hostels, hospitals, hotels can't afford these costs. Hence, there is need to develop floor cleaning machine which is cost effective using renewable sources. In crowdie places such as railway stations floors are not regularly cleaned due to hectic work of sweepers and non-availability of machines because of this, hygienic environment is not maintained.

In India, especially in summer there is power crisis, in majority of places. Hence floor cleaning using floor cleaning machine is difficult without electricity. To overcome this problem, an alternative is made semi-automatic machine

– Main mottos of research are:

- To reduce the human effort and cost.
- To make the environment sanitary.

## II. LITERATURE REVIEW

This paper elaborates the design and fabrication of a floor cleaner which runs purely on mechanical power and also has the capability of being ridden at low speeds by the user. The mechanism used to drive the cleaning mechanism would be similar to the one used in a spinning mop commonly known as a ‘magic mop’. The mechanism works using a spur gear system wherein high speed multiplications can be obtained using the right gear specifications. Also with help of the chain drive power can be transmitted. The input to the system would be in the form of a pushing force accessible by the user.

## III. PROBLEM DEFINITION

The major problem which India faces is cleanliness. The problem we came across was cleanliness on roads, pathways, lanes, highways, railway stations airports etc. The dust and dirt on the road as well as metal and other pieces on the road are a problem for the humans. It is harmful for human race as well as the vehicles running on the road. Dust and dirt causes asthma and other respiratory problems. On the other hand metal particles and other abrasive particles are harmful for tires of vehicles.

The main feature would be cost efficiency as the cost to make the machine is very less as compared to other cleaners available in the market. Another major problem in India is load shedding and most of the cleaners are electrically operated. So to overcome this problem we are using the battery system which can be recharged when electricity is available and work as and when required. We also looked over a fact that we should not totally remove employment so such a machine is designed which will remove the waste to the sides of the road. This waste can then be cleaned by the sweepers and ultimate cleanliness can be achieved. Apart from this the choked manholes and sewer pipes can be cleaned by the multipurpose road cleaning machine.

## IV. METHODOLOGY

### A. Chassis

The chassis is made up of fully MS Square section. Which having high strength to carry the all load of the system. So that mild steel is the best material for carrying the maximum load.

### B. Body

The body is made up of 2mm thickness sheet. There are many different metals that can be made into sheet metal, such as aluminium, brass copper, steel, tin, nickel and titanium. The body or outer case is made with the

help of the sheet metal having material as mild steel, aluminium, etc.

### C. Sweeping roller

There are several names for floor sweeping roller brushes, eg. brush roller, broom roller and sweeping rollers. But they have the same goal, namely sweeping roads and large floors, car parks and runways. These brushes can also be used for removing weeds from pavements. For these purpose, the roller brushes are made of synthetic fibers or steel wires. they have a square bore and consist of one or two parts, dependent of length.

Sweeping rollers are mainly made up of nylon material. which is very soft and elastic which takes off all the dust and dirt particles.

### D. Chain drive

Roller chain and sprockets are very efficient method of power transmission compared to (friction-drive) belts, with less frictional loss. Drive chains are most often made of metal, while belt are often rubber, plastic, urethane, or substances. Although chains can be made stronger than belts, their greater mass increases drive train inertia.

### E. Gear Drive

A mechanism consisting of toothed wheels that engage and transmit rotary motion, usually transforming angular velocity and torque. Gears are made with spur teeth for operation at low and medium speed in open drives. We are using gear drive to change the direction of rotation of the roller brush by using gear and pinion pair.

## V. WORKING PROCESS

Wheels are attached by using shaft which carrying the sprocket having large diameter. Then by using the chain drive that power is transmitted to the smaller sprocket which is connected with gear drive to change the direction or rotation of sweeping roller than the direction of rotation of sweeping roller than the direction of rotation of wheels. Also increases the speed of sweeping roller. Infront of the sweeping roller the the garbidge collector is fitted to collect garbidge coming from sweeping roller.

As floor cleaner moves in forward direction, the power is transmitted from wheels to chain drive and then through spur gear to the sweeping roller due to forward motion to floor cleaner. Sweeping roller rotates with high speed as per gear ratio, so that it can collect the garbidge and clean our floor.

## VI. ADVANTAGES

- Overall efficiency of the system increases due to use of high gear ratio.
- Source of energy is available free of cost.
- The operation of the system is very easy.
- Manually operated system is pollution free.
- Noise free operation.
- Due to man power it saves conventional fuel.

## VII. DISADVANTAGES

- High wear of the brush.
- Limitation of storage of garbidge.
- System becomes more bulky because of overall equipment.

## VIII. CONCLUSION/DISCUSSION

The principle thought process of the undertaking is to cover the parts of neatness in the general public. It centers around neatness of schools, doctor's facilities and different floors. The numerous applications give an extensive variety of capacities in which we expel tidy and earth from the floor, . By use of basic designing innovation we learned in our building life we have collected such a machine which has numerous highlights being financially savvy in the meantime. The low spending venture is exceptionally helpful for the general public and being financially savvy and vitality productive can assume an imperative part in tidiness of India.

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