



Eco-friendly Road Cleaning Machine

By Shivam Deokar, Arpit Gaikwad, Gaurav Bhoge & Om Dange

Abstract- This paper is related to design and development of most effective machine that is manually operated mechanical pollution free road cleaner. The Road cleaner is used to keep our mother earth clean. So that we feel fresh while walking on streets. Generally, in era of modern technology, different devices such as electric motors, diesel engines and robots are being used to clean floor, road. These methods make much pollution, maintenance and very tough to carry out. The main objective of this paper is to spread this idea of our prototype road cleaner to each one which aims to. Hence, the present work is aimed to design and develop a manually operated road cleaning machine which is eco-friendly, cost effective, portable and less maintenance. Cleaning has become a basic need for all human beings and it is unavoidable in our daily routine process. The conventional floor/road cleaning machine is most widely used in railway stations, airports, hospitals, Bus stands, colleges etc. also this machine needs electrical energy for its operation. It is not user friendly as well as ecofriendly. In summer time there is power crisis and most of the floor/roads cleaning machines are not used effectively due to this problem particularly. In our project we are using easily available materials with low cost. It is the better alternative for conventional machine. Hence this project is very useful in our day to day life.

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Eco-friendly Road Cleaning Machine

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I. INTRODUCTION

Cleaning machine is very much useful in cleaning around us like road, ground our colleges campus, outside ground and public place etc. In modern days interior as well as outside cleaning are becoming an important role in our life.

Cleaning of waste is a very important one for our health and reduces the man power requirement. Many of road cleaning machines are available but we had developed a machine which is very simple in construction and easy to operate. Anybody can operate

this machine easily. Hence it is very useful in cleaning the cricket ground, any large area space.

II. LITERATURE SURVEY

1. Manual cleaning is time consuming so, by using manually operated road cleaning machine we can save time.
2. It was seen from literature survey that cleaning is less effective where the road seems to be very rough and damage.
3. Maintenance of machine is less and it is easy to control and clean.
4. Vacuum, Brushes, Vipers, Mobs, Scrubbers, etc. from these can be use to make the design economical and conventional.
5. Further modification in the vehicle can be made automated using sensors and electrical circuits.
6. This can be modified according to the Indian road conditions and where it needs to be used.

a) Working Principle

Eco friendly road cleaning machine is an advanced type of machine used for the roads or streets. Eco friendly road cleaning machine we are making without using any power supply, fuels and engines. The machine is run by a human effort or a man power. The system is fixed with pair of wheels which are connected with the help of shaft. The shaft makes the wheels connected to one and other.

The wheels are moved for a desired position with a help of manual force which can handle is provided to move. The handle can be adjusted for a required height. A chain drive is connected to the wheels. The chain is moved according to the wheel. The brush moving opposite direction of the wheels move and the brush brooms the waste present on the road also it dumps the waste into the waste collecting box. The waste collecting box is removed to dump the waste into desired places.

b) Specifications

Specification of Chassis

Length	780 mm
Breadth	370 mm
Height	
Thickness	
Mass	

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Specification of wheel

Diameter of the Rear wheel	380 mm
Diameter of the Front wheel	200 mm
Number of the wheel	4

c) *Problem Identification*

During the manual cleaning operation some dust and dirt particle may remain on the floor and due to the action of air. The dirt and dust particle transfer from one surface to another surface which create the problems during cleaning which tends to increase manual effort. Due to which desire cleaning of the surface is not gain and because of that it takes more time.

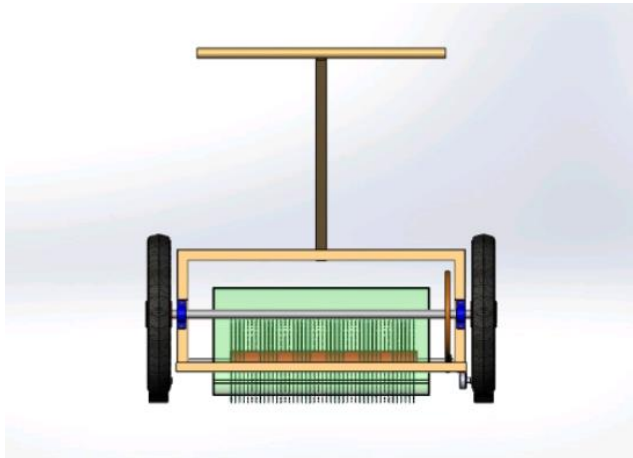
d) *Objectives*

1. To develop a machine that helps in easy and quick cleaning.
2. To provide the alternative method for road cleaning.
3. To reduce human efforts.
4. To save the time.
5. To reduce the cost anyone can use and easy to operate.

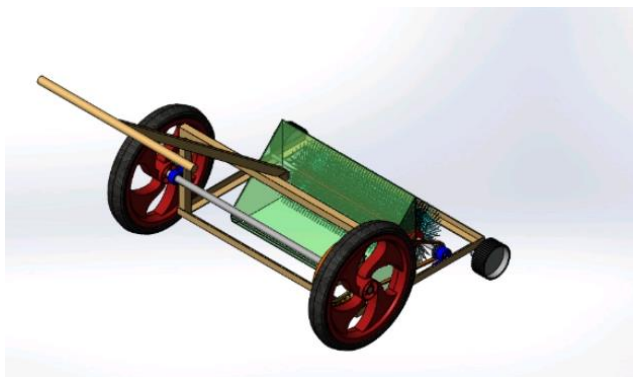
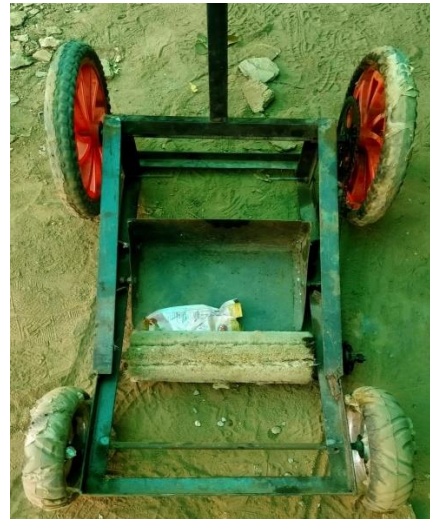
e) *Design*

In the design of the road cleaning machine is very compact as compare to other cleaning machine are available in the market but has the attractive design and high durability and cheap cost as compare to other road cleaning machine.

3D VIEWS

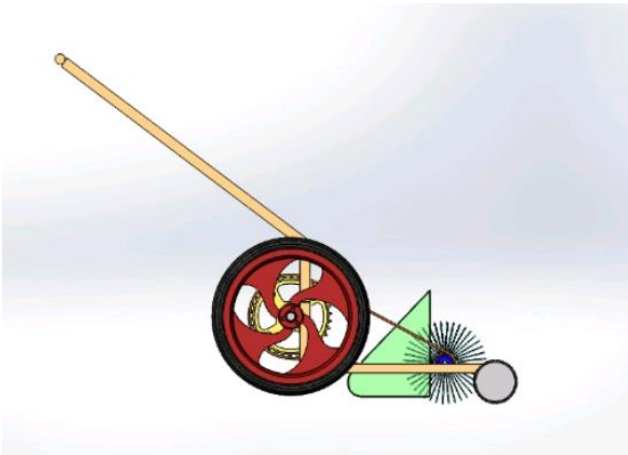


1. FRONT VIEW



2. TOP VIWE





3. SIDE VIWE

f) Components used in Road Cleaner

1. Wheels
2. Shaft
3. Bearings
4. Brush
5. Chain
6. Chain Sprocket
7. Frame

g) Applications

Around Hospitals- Cleaning machines are used in hospitals for cleaning in order to obtain hygienic surface.

Roads- To maintain the desired cleaning surface finish.

Colleges- It is mainly used to clean the dust which is collected on the surface in campus.

h) Future Modification

1. *Plastic Brush can be changed to coir brush*

The plastic brush which is not long lasting can be avoided by using a coir brush which is more efficient for the machine.

III. CONCLUSION

The manually operated eco-friendly road cleaner is successfully designed, analyzed and fabricated. This project works and implements the manually operated ecofriendly road cleaner for road cleaning that reduces the cost, human efforts as well as time. It is the best alternative for automated road cleaning machine during power crisis. It is found that the existing road cleaning machines uses petrol and diesel. It can cause pollution and also the vibration produced in the machine causes noise pollution. While manual cleaning may cause healthy problem as the person directly comes in contact with dust. Also, the shoulder problem due to continuously sweeping occurs.

A manually operated eco-friendly road cleaner is an alternative concept for avoiding such problems.



The manually operated eco-friendly road cleaner can work very efficiently with respect to covering area, time and cost of road cleaning process compared with the existing machineries. Also it is economical. It was seen while testing of machine, that the cleaning is less effective where the road seems to be very rough and damaged. It can provide job to the uneducated person who is in need for such jobs as human energy is needed to drive the machine.

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