

Design and Development of Smart Street cleaning Machine

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Abstract: The purpose of this project is to clean the road in colleges, hospitals, auditoriums, malls and workshops. The aim of this project work is to design and develop process for cleaning the road. It is very useful for cleaning the road and ground. In modern days interior decorations are becoming an important in our life cleaning of road is very important for our health and the road cleaning machine reduces the effort required for cleaning. Hence this project is very useful in our day to day life. It is very simple in construction and easy to operate and little bit cheap, anybody can operate this machine easily. The road cleaning machine consist of , broom and for reducing the cleaning time. The overall cost of this machine is also cheap. Such type of machines is widely used for this purpose but they are working under different principles and the cost is very high. In recent years, floor cleaning machines are getting more popular for cleaning large area in minimum time. However in India, which is a developing country requires large type of such machines to satisfy the cleaning needs.

Keywords: road cleaning machine; sweep cleaner.broom

I. Introduction

Cleaning machine is very much useful in cleaning around us like road and ground and our colleges campus and 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 developed machine 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. The time taken for cleaning is very less and the cost is also very less. Maintenance cost is less. Much type of machines is widely used for this purpose. In our project we have made the machine to operate in a fully mechanical way with a little amount of electrical components. The Floor cleaner is of very simple construction and is very easy to operate; anyone can operate it without any prior training of any sorts with safety. Cleaning is essential need of this generation. Basically in colleges ground cricket ground and road for cleaning regularly different...rotary motion on the floor which cleans the dirt or dust. The remaining water on the floor is wiping by the wiper present in end of the cleaning machine.

II. History



Fig 1 Mechanical sweepers in the United Kingdom

By the 1840s, Manchester, England, had become known as the first industrial city. Manchester was home to the first passenger rail service in the world and had one of the largest textile industries of that time. As a result, the robust metropolis was said to be England's unhealthiest place to live. [1] In response to this unsanitary environment, Joseph Whitworth invented the mechanical street sweeper. The street sweeper was designed with the primary objective to remove rubbish from streets in order to maintain aesthetic goals and safety.

III. 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 not gain and because of that it takes more time.

During the rainy season the muddy water are dump on the corner of the wall with the help of manual cleaning it cannot possible to remove all the water from the surface of the floor which creates sleepy surface and which may increase the chances of accidents also the water which remains on the corridor enter into the rooms. Due to uneven surface of the corridor or floor during the wet cleaning of the surface desired cleaning not obtained and backflow of the water occurs which tends to increase manual effort and it is difficult to clean uneven surface of the floor and takes more time for cleaning of the surface.

IV. 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.
6. To remove grit and sand which scratch and wear down the surface.
7. To remove allergens, in particular dust.
8. To make the environment sanitary.



Fig 2 Smart sweep cleaning machine

V. Research Methodology

Problem Identification:

During literature survey we got that on many large places it hard to clean road properly. Like in collages, companies, around hospital etc. in this places the cleaning of road takes much time and men power this cleaning is done on large scale because the area to be covered to clean is so large and this places doesn't clean properly by manual cleaning.

Literature Survey:

After studying the various research papers of road cleaning machines we have concluded that there are certain limitations are in road cleaning machines which can be worked upon. For example cleaning machines are made with an aim to clean the road and ground. This means that they are only sufficient in the summer and winter season but not in rainy season this is the major issue for cleaning the road and ground but during the rainy season road cleaning. road cleaning machine: This machine can remove the dust in summer season and also it can remove and clean the dirt, wastage

Market Survey:

During the market survey we got that in the market there are several types of road cleaning machines are available for large scale cleaning but the cost of these machines are very high.

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.

Testing:

After the completion of this project we tested and concluded that the cleaning performance of these machines is satisfactory.

VI. Working

When a pedal of cycle is started to rotate cycle will be moving in forward direction due to this rear axle will also moving along with cycle. Due to this axle rotation wheels will also rotating. when the wheel is rotating differential will also rotate.as propeller shaft is connected to disc in which different brooms are connected due to this disc will be rotating along with broom and it will clean the road.it means power will be transferred to brooms by the rotation of wheels and cleaning will takes place.

VII. Advantages

1. Manual effort is reduced: This road cleaning machine has the mechanical work system that reduces the manual effort in the cleaning of surface.
2. Operating time is less: As we are using.
3. We can reduce the operating time and cleaning work can be done faster.
4. This machine requires low Maintenance cost.
5. In this machine Easy control of cleaning solution supply by controlling valve.
6. It can be used on various places other than rough surfaces like road and residential areas.
7. By further modification the drive or movement can be made automatic.

VIII. Disadvantages

1. Road cleaning machine produces vibrations when used on rough road or rough surfaces.
2. Road cleaning machine is Suitable for only rough surfaces can't use in small area.
3. It is heavy to lift.
4. It is not capable to clean stair of any building.
5. Maintenance of mop is required.

IX. Applications

1. Around Hospitals – cleaning machines are used in hospitals for cleaning in order to obtain hygienic surface.
2. Road – To maintain the desired cleaning surface finish.
3. Colleges – it is mainly used to clean the dust which is collected on the surface in campus.

X. Conclusion

The main motive of the project is to cover the aspects of cleanliness around our areas. The multiple applications provide a wide range of we can clean around our environment due to cleaning machine. This project is very helpful for the roads and grounds and plays a vital role in cleanliness of the country. If these features will be modified, this will work well. As a whole this is a successful product developed that can be used in current our colleges and grounds and campus.

The power saving and cost saving too mechanical road cleaning machine is designed and manufactured using less energy and limited worker who operate this. Manufactured machine is flexible and effortlessly operated. Manual Sweeping done by man might not be that effective as it will not be picking up everything in as it is not in sight but using the road cleaner it can be done easily. 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.

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