



DESIGN AND FABRICATION OF ECO-FRIENDLY ROAD CLEANER MACHINE

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ABSTRACT

Cleaning is the main basic need for all human beings and it is necessary for daily routine process. The conventional road and floor cleaning machine is most widely used in many applications such as example roads, railway stations, airports, hospitals, bus stands, in multi buildings, colleges etc. also this machine uses human energy for its working operation. It is a user friendly as well as eco-friendly. In our project we are aimed to use easily available material with low cost and it can be easily fabricated and easy to use and control. It is the better alternative for conventional machine. The manually operated eco-friendly road and floor 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 to use.

KEYWORDS - Cleaning, Road, Floor, Conventional, Economic.

I. INTRODUCTION

Cleaning is a necessary factor of daily routine process. Effective cleaning and sanitizing help and protect the health of human beings directly and indirectly. The Road cleaner is used to keep our surroundings clean. So that we feel fresh while walking on the streets. Generally, in the era of modern technology, different devices such as electric motors, diesel engines, and robots are being used to clean the floor, road. But such processes create abundant pollution, maintenance and are very tough to carry out. So, in order to save energy and save nature, there is a need to develop, user-friendly road and floor cleaning machine.

A machine which should be operated manually so that it can be as an alternative for conventional electric cleaning machine. The dust cleaning machine system is fixed with a 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 to the desired position with the help of manual force, which can handle is provided to move. The handle can be adjusted for a required height and are provided three adjusting holes for it. A chain drive is connected to the wheels and gear at each side. The chain is moved according to the wheel and gear.

The brush moving the alternative 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 collection box is removed to dump the waste into desired places.

II. METHODOLOGY

We came across the points that the available road cleaning machines that are in use cannot clean the floor and compact roads effectively, like in collages, companies, hospitals, and household purposes. Thus, for this an alternative method is essential. To overcome these disadvantages a simple and eco-friendly design is made. This machine is feasible to use for the household purposes and compact spaces. According to precious research the conventional road cleaning systems are costly and heavy that cannot clean most of the rough spaces. The alternative method that is used to overcome this drawback effectively.



III. MODELING AND ANALYSIS

Model and Material which are used is presented in this section.



Figure 1: Eco-friendly Road Cleaner Machine

IV. RESULTS AND DISCUSSION

Mechanical sweeper for industrial/ professional cleaning and sweeping requirements better. The action of the brooms throws the dust and the debris into a large capacity. Heavy Duty Machines. High Pressure Machine. Cleaning machine is very much useful in cleaning floors and outside ground in hospitals, houses, auditorium, shops, bus stands and public places etc. Many of floor cleaning machines are available but we developed machine is a very simple in construction and easy to operate. Anybody can operate this machine easily. Hence it is very useful in hospitals, any large area space. The time taken for cleaning is very less and cost is also very less. Maintenance cost is less. In our project we have made the machine to operate in a fully mechanical way. The floor cleaner is very simple in a construction and very easy to operate, anyone can operate it. Without any prior training of any sorts with safety. 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.

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 used to make the design economical and conventional.
5. Further modification in the vehicle can be made automated using sensors and electrical circuits.
6. The vehicle can be modified according to the Indian road conditions and where it needs to be used.
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8. It was seen from literature survey that cleaning is less effective where the road seems to be very rough and damage.
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V. CONCLUSION

Project, we conclude that, our machine is safe, ecofriendly and reduce the cost and time of dust cleaning done by manual process. This is the best alternative method for cleaning road side dust. In our cleaning machine when motor starts, Scrubber brush scrubs the dust separated on road divider and cyclone vacuum collector collect that dust into the collector tank. Only one person is required to operate machine and cleaning is done at very less human effort. Using this Simplified Road Cleaning Machine with Modified Technology, Suitable for Indian Conditions, because of its reliability and expendability. Due to total cost of the system is very low and only one time investment has to be made for reducing labor charges. It will reduce human efforts drastically and very helpful to clean roads even in traffic. Due to these benefits, usage of this system helps in cleaning roads. I think there may be chance of using this machine in future of India A mechanical setup is intended with synergies of mechanics and mechanical systems to produce economical cleanup, each at floor and therefore the road surfaces. This project works implements the operated by hand eco-friendly road cleaner for road cleanup that reducing the value, human efforts likewise as time. it's the simplest various for machine-driven road cleanup machine throughout power crisis. it's found that the present road cleanup machines use gasoline and diesel. It will cause pollution and conjointly the vibration made within the machine causes sound pollution. The machine is economical. Manual



cleanup might cause shoulder downside thanks to continuous sweeping. The straightforward mechanisms used during this system makes the vehicle easier for operation.

VI. REFERENCES

1. Ashish Patil, Pranav Patil, Jaywant Patil, Rohit Ingawale, Sanket Nalawade, Amar Patil (2018). "Design & Development of Road Side Cleaning Machine", *International research journal of engineering and technology*, ISSN: 2395-0056, Volume 05, Issue 4.
2. Meshram, S., & Mehta, G. (2016). "Design and development of tricycle operated street cleaning machine", *Journal of information, knowledge and research in mechanical engineering*, 4(1), 702-706.
3. Akshay nighot, Yogesh jadhav, Pritam jagadale, Ishwar jadhav, Avinas hbharate (2019). "Design & Development of Low Cost Manually Operated Sweeping Machine", *International research journal of engineering and technology*, ISSN: 2395-0056, Volume 06, Issue 6.
4. Shuzaib kalam, Jatin Sekhri, Twinkle Baudh, Shivam Kumar, Sarthak Jha (2018). "Road Side Dust Collector Machine", *International research journal of engineering and technology*, ISSN: 2395-0056, Volume 05, Issue 3.
5. Muhammad I. Taiwo, Mohammed A. Namadi, and James, B. Mokwa (16). "Design and analysis of cyclone dust separator", *American Journal of Engineering Research (AJER)*, ISSN: 2320-0847, Volume-5, Issue-4.
6. Muhammad Kashishaikh Ghaffar, M.Aadril Arshad, Nanadkishor S. Kale, Prof. D.M.Ugle (IJAERD, April 2018), *Design & development floor cleaning machine*.
7. V.Kaliaselavn, P.Jagadeseswaran, M.Gopi, B. Rahulraj (Nexgen Technologies, jan 2018), *Fabrication of modern road cleaning vehicle*.
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