iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 11 **Issue:** II **Month of publication:** February 2023

DOI: https://doi.org/10.22214/ijraset.2023.48974

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 11 Issue II Feb 2023- Available at www.ijraset.com

Design and Fabrication of Eco-Friendly Road Footpath Cleaning Machine for Industries

Manjunathan. R[1], Lokesh. S[2], Pradeep Kumar.V[3], Tharun Kumar. S[4]
[1]*Assistant professor,* [2, 3, 4]*Under Graduate Scholars,Department of Mechanical Engineering,Vel Tech High Tech Dr.Rangarajan Dr.Sakuthala Engineering College , Avadi Chennai 600 062 , Tamil nadu, India*

Abstract: ***With the growth of technology, researchers are paying greater attention to automated floor cleaning devices in order to make mankind's existence more comfortable. The concept is gaining traction in developed countries, although it is still unpopular because to design complexity, machine costs, and power tariff running costs. A manual floor cleaning machine is proposed in this project.***
Early in the day, a floor is cleaned with a broom that is controlled by a human hand. This requires a continual movement of the human hand, which is exhausting and time demanding. The goal of this project is to provide a modernised procedure for wet and dry floor cleaning.
This equipment is capable of cleaning floors in both dry and wet conditions. It also has a dust storage box. It was decided to create a prototype model that uses a DC drive powered rotary brush with pneumatic controlled dust shifting to assist users in removing waste and maintaining a clean and hygienic environment, thereby avoiding health inequalities and safety concerns
Keywords: Road cleaner, Human powered, Roller brush, Pedal axle, Eco-Friendly Dust collector

I. INTRODUCTION

Effective cleaning and sanitizing help and protect the health of the human beings directly and indirectly. Also, cleaning and sanitizing prevents the pest infestations by reducing residues that can attract and support bees, pests etc. It also improves the shelf life of the floor, walls etc. due to regular cleaning and maintenance.
Cleaning has become a basic need for all human beings and it is unavoidable daily routine process. The conventional road cleaning machine is most widely used in railway stations, airports, hospitals, Bus stands, etc. also this machine needs electrical energy for its operation. It is not user friendly as well as eco-friendly.
In summertime there is power crisis and most of the 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.
Our focus is to develop a machine which should be operated manually so that it can be alternative for conventional electric road cleaning machine. In this work we have done modeling and analysis of the road cleaning machine. We used such type of materials for manufacturing of road cleaning machine finally. We have observed that all the components are with in safe limit in the manually operated road cleaning machine.

A. Components

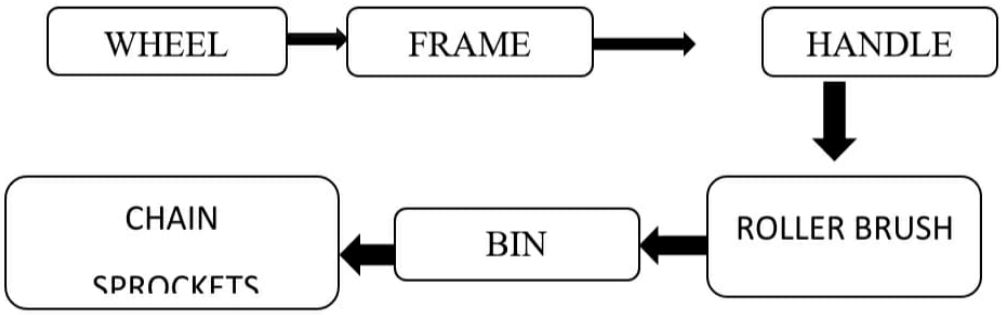
1) Wheels
2) Frame
3) Collector bin
4) Sprockets
5) Chain
6) Shaft
7) Handle
8) Base Frame
9) Supporting Frame
10) Mounts and Joints
11) Screws and Bolts

©IJRASET: All Rights are Reserved

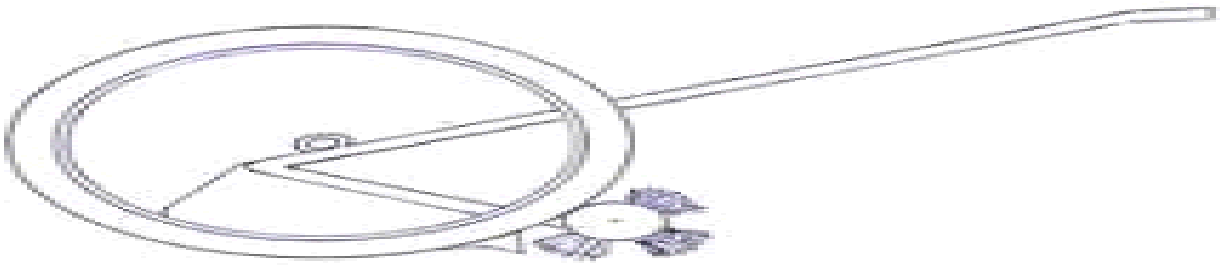
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 11 Issue II Feb 2023- Available at www.ijraset.com

II. BLOCK DIAGRAM OF ECO FRIENDLY DUST CLEANING MACHINE

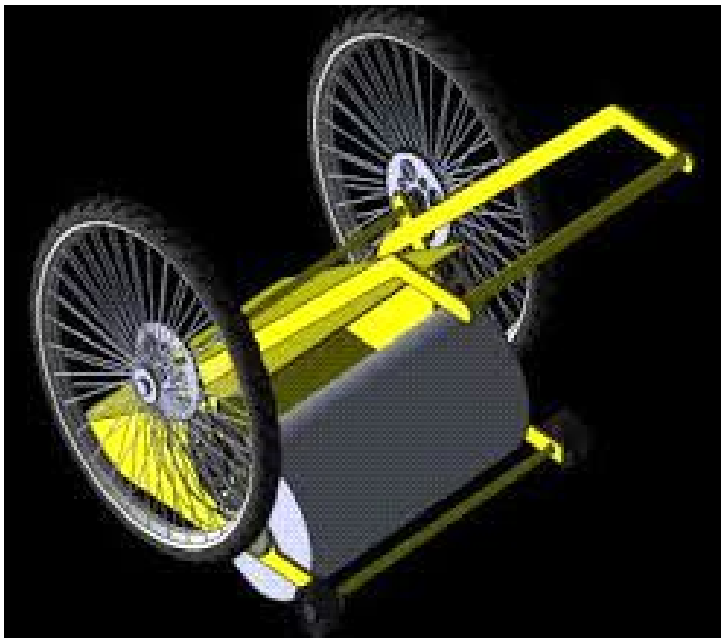
A. Block Diagram



B. Side View Of The Machine



C. 3D View Of The Machine



©IJRASET: All Rights are Reserved

D. Advantages

The machine has following advantages

1) Time required for process is less.
2) Number of workers required is less.
3) This road cleaning machine is specifically designed to clean the roads which are plane and smooth, such as tiles, mosaic and cemented smooth surfaces.
4) Machine is simple to use.
5) Unskilled worker can also use machine.

E. Applications

1) Municipal Corporations
2) Ports
3) Airports
4) Cements Factories
5) Steel Factories
6) Food Industries
7) Engineering Industries
8) Highways
9) Electronic Industries

III. RESULTS AND DISCUSSION

This design of eco-friendly road cleaning system can be used to clean any kind of remote places. As the chain mechanism selected can consume much less power so it will be the power saving and cost saving as well. Also, there is a need of a brush which operates automatically. As well as provides new add on of sanitization of road. Successfully designed, analyzed and fabricated. This project works implements the manually operated eco- friendly road cleaner for road cleaning that reducing 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.

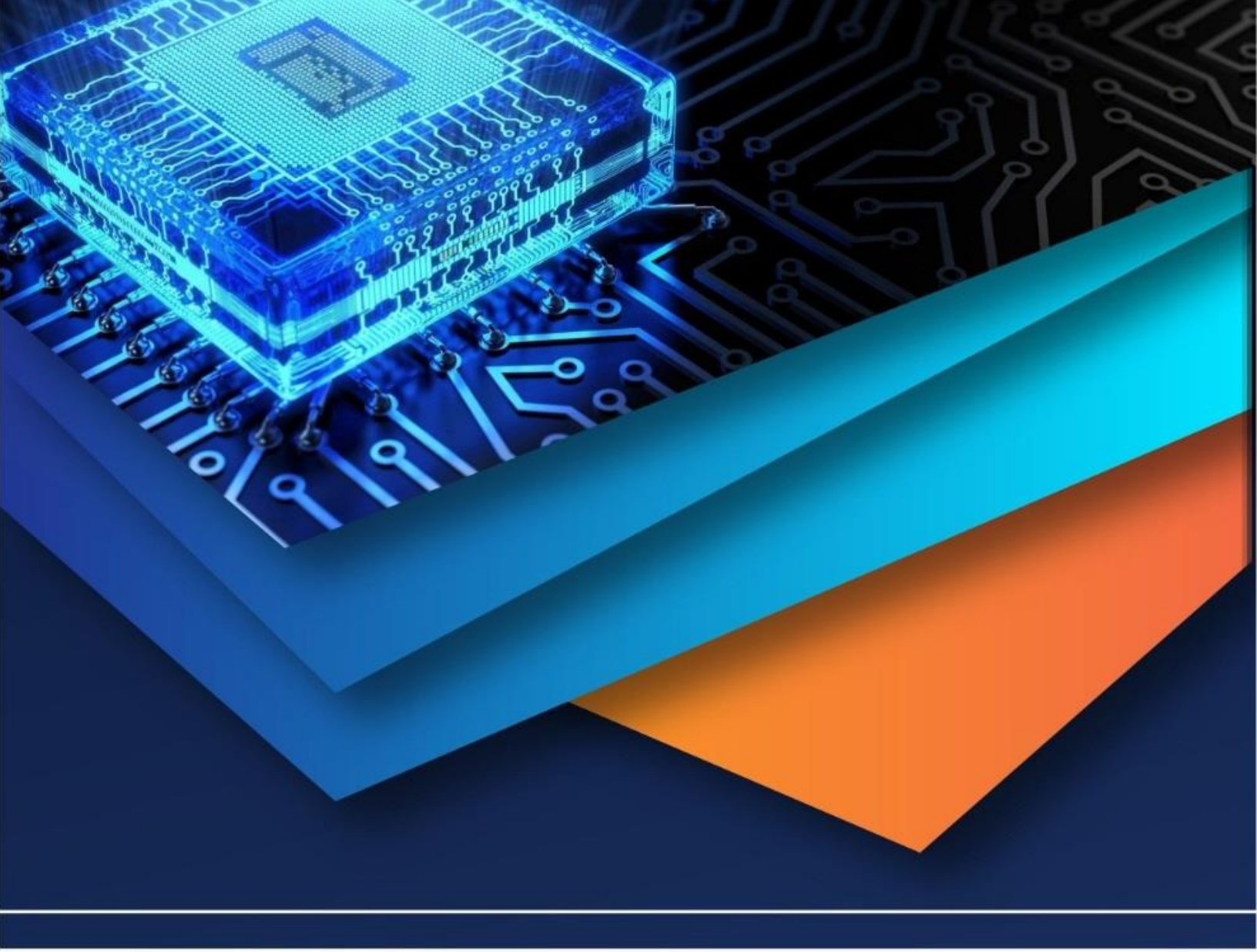
IV. CONCLUSION

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 uses 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.

REFERENCES

[1] Liu, Kuotsan, Wang Chulun, A Technical Analysis of Autonomous Floor Cleaning Robots Based on US Granted Patents, European International Journal of Science and Technology Vol. 2 No. 7 September 2013, 199-216.
[2] Imaekhai Lawrence, Evaluating Single Disc Floor Cleaners: An Engineering Evaluation, Innovative Systems Design and Engineering, Vol 3, No 4, 2012, 41-44.
[3] Abhishek Chakraborty, Ashutosh Bansal, Design of Dust Collector for Rear Wheel of Four-Wheeler, International Journal of Emerging Technology and Advanced Engineering, Volume 3, Issue 7, July 2013, 199-216
[4] Jens-Steffen Gutmann, Kristen Culp, Mario E. Munich and Paolo Pirjanian. The Social Impact of a Systematic Floor Cleaner. In IEEE international workshop on advance robotics an its social impacts , Technische University munchen, Germany May 21-23,2012

©IJRASET: All Rights are Reserved | SJ Impact Factor 7.538 | ISRA Journal Impact Factor 7.894 |



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)