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Manually Operated Eco-Friendly Road Cleaning Machine

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Abstract: *A manually operated eco-friendly road cleaning machine designed to address the challenge of urban road cleanliness while minimizing environmental impact. The machine incorporates innovative features such as a human- powered propulsion system and sustainable materials, making it an environmentally conscious alternative to traditional road cleaning equipment. Through a combination of mechanical and manual processes, the machine efficiently collects debris and waste from road surfaces, contributing to cleaner and safer urban environments. This abstract highlights the key design principles, operational features, and environmental benefits of the proposed road cleaning machine, showcasing its potential for enhancing sustainability in urban maintenance practices.*

Keywords: Enhancing safety and convenience

I. INTRODUCTION

An eco-friendly, manually operated road cleaning machine represents a proactive approach towards maintaining clean and sustainable urban environments. This innovative machine is designed to efficiently remove debris and dirt from roads while prioritizing environmental consciousness and user-friendly operation Cleaning is the essential need of current time. Cleaning machines are very useful in cleaning floors, outside ground in hospitals, houses, auditoriums, bus stands and public places etc. Many researchers have done so many works in evaluation of design of cleaning machine to give better outcomes, but many researchers were operating their machine with the help of any external source like electrical energy, but this machine has been designed in such a way that it can be operated by manual power and there is no need of electric energy or any other energy. For the above said purpose the manual power is transferred from the chain socket to the gear through chain mechanism then its power transfer to bevel gear and it result to rotate the wheels and floor cleaning work is performed, which makes this machine completely manually operated without any external source of energy and its manufacture, and design is also cheaper in cost and reliable for everyone [1]. It is capable for the cleaning purpose of both dry and wet floor and easily transfer from one place to other due to its light weight and simple design. Also, a benefit is that it is environmentally friendly. The components have been used in designing this mechanically operated floor cleaning machine are steel bar, bevel gear, wheel, wooden clips, bearing, rod, wiper, chain socket, gear. Building maintenance is often characterized by an infinite series of drab, unclean, time-consuming, and unpleasant duties such as floor washing. Abstract Although there have been multiple precedents demonstrating the benefits of deploying floor cleaning robots to maintain constructed structures, standard platforms have performance issues. Their fixed morphological design, which severely limits their navigation and access, is a primary contributor to their performance shortfall. The designed robot can change its morphology to seven one-sided tetramines in reaction to its sensed environment to maximize its coverage area. This research examines the coverage area performance of the robot and compares it to two widely available fixed morphology robot platforms. The traditional mechanically operated floor cleaning machine is most used in road, school, house, bus stand, mall, airport and other commercial place. This machine does not require any type of external source of energy for its operating. The aim of present work is to design and develop process for cleaning the dry as well as wet floor manually. This mechanically operated floor cleaning machine is designed by keeping the basic consideration for reduction in cost and efforts while being environment friendly and easy to handle.

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II. BACKGROUND

Cleaning is the main basic need for all human beings and it is necessary for daily routine process. The conventional road 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 materials 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 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.

III. PROBLEM STATEMENT

Conventional road cleaning methods are environmentally harmful and inefficient, contributing to pollution and safety hazards in urban areas. The lack of eco-friendly, user friendly road cleaning solutions impedes community efforts for a deanery environment. There is a pressing need for a sustainable, manually operated road cleaning machine that minimizes environmental impact, ensures effective cleaning, and encourages community engagement in maintaining pristine urban roads

IV. SOLUTION OVERVIEW

Developing an eco-friendly, manually operated road cleaning machine using recyclable materials and an intuitive design will offer an efficient and environmentally responsible solution. By integrating eco-friendly brushes and an advanced debris collection system, this machine will ensure effective cleaning while minimizing environmental impact. The goal is to create a durable, user-friendly tool, encouraging community engagement and promoting a cleaner, safer urban environment.

V. WORKING OF SYSTEM

A manually operated eco-friendly road cleaning machine operates through the diligent effort of a human operator. Equipped with a cleaning mechanism, this machine can feature rotating brushes, sweepers, or a vacuum system, depending on its design. As the operator pushes or guides the machine along the road, the cleaning mechanism actively removes debris, including dust, leaves, litter, and other contaminants, from the road surface. The collected debris is then directed into a dedicated collection bin or bag integrated into the machine. Depending on the design, the power source for this eco-friendly machine may be manual, utilizing hand-cranking or pedal power, or it could incorporate renewable energy sources like solar panels or wind turbines for auxiliary features such as lights. Safety and environmental considerations are paramount, with features like reflectors, lights, and pollutant control mechanisms ensuring the safety of the operator and the environment. Regular maintenance and proper disposal of collected debris are integral to the machine's efficient and eco-conscious operation. Furthermore, user training is essential to guarantee effective and safe usage of this eco-friendly road cleaning device.

VI. CONCLUSION

The design of manual operated road cleaning system can be used to clean any kind of remote place. As the chain mechanism selected can consume much less power so it will be the power saving and cost saving. The manual operated 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.. It's economical to use.

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