



e-ISSN: 2319-8753 | p-ISSN: 2347-6710

IJRSET

International Journal of Innovative Research in
SCIENCE | ENGINEERING | TECHNOLOGY



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 13, Issue 2, February 2024

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 8.423

9940 572 462

6381 907 438

ijrset@gmail.com

www.ijrset.com

Design and Fabrication of Sand Cleaning Machine

Vijay Varak, Saurabh Gawas, Samuel Gauncar, Mayuresh Parab, Anthony Fernades, Tejas Matondkar,
Mr. M.R.Ghatage.

Yashwantrao Bhonasale Institute of Technology, Sawantwadi, Mechanical Engineering, Maharashtra, India.

Yashwantrao Bhonasale Institute of Technology, Sawantwadi, Mechanical Engineering, Maharashtra, India.

ABSTRACT: Beaches are one of the main tourist attractions in the coastal parts of India. They are also the most polluted. Most government neglected cleaning of beaches. The main reason being the difficult nature of cleaning it. It takes up lot of resources and time. The workers need to manually pick the waste. The waste when thrown in the sand gets covered with the sand by the heavy coastal winds. This makes the spotting of waste difficult. It is difficult for the workers to clean as they have to dig each cubic feet to collect the waste. The heat and humid climate of the beaches makes the working conditions worse. Many organisations and government bodies are taking several steps to get rid of the waste accumulated in beaches more effectively.

KEYWORDS: Beach cleaning machine, Eco-friendly, Single man operation beach cleaning, Coastal area

I. INTRODUCTION

Beaches are one of the main tourist attractions in coastal parts of India, but Also the most polluted, most government neglected cleaning of beaches. The main reason being the difficult nature of cleaning it. It takes up lot of resources and time, our project aims towards clean the beaches easy and fast. The pollution control is weak, leading to unhealthy and inefficient city, our project ‘Design and manufacture of Beach Cleaning Machine’ will help control pollution. The workers need to manually pick the waste. The waste when thrown in the sand gets covered with the sand by the heavy coastal winds. This makes the spotting of waste difficult. It is difficult for the workers to clean as they have to dig each cubic feet to collect the waste. The heat and humid climate of the beaches makes the working conditions worse. Our project aims towards cleaning the beaches in the city. It will help with the sanitation issues in the city. The pollution control is weak, leading to unhealthy and inefficient cities, our project will help control pollution. The heat and humid climate of the beaches makes the working conditions worse. Many organizations and government bodies are taking several steps to get rid of the waste accumulated in beaches more effectively. India has a long stretch of coastline of about 7517 Km with nearly 170 famous beaches both on eastern and western coasts. Our aim of work is to design and fabricate the beach cleaning machine. We have created a simple economical design so that it will be easy for maintenance and use. The parts have been sourced locally so replacement parts will be easier to get. The machine is environment friendly and can run in any conditions offered by the beach. We have designed and manufactured a beach cleaning machine which is both cheap and easy to use. It does not have a huge learning curve. The machine runs on human power or electric motor. Waves bring in a lot of waste from deep sea. These plastic waste slashes into the beaches and gets mixed with the sand.

II. RELATED WORK

The concept of image inpainting was first introduced by Bertamio et al. Vivek Dhole et al [1] The design trailer prototype was carried out using a three-dimensional solid modeling computer program and explored the economics of the beach- cleaning trailer in terms of payback period, charging rate to customer, working areas R. Ram Moorthi et al [2] The surface trash from the water body is lifted by the machine, it will cause in the decrease of water contamination and the aquatic plants and other living things death due to these harms will be decreased C. Balasuthgar et al [3] When designing the collection mechanism, the biggest concerns were manufacturability, and durability. Furthermore, design had to allow the beach cleaner to pick up a wide range of trash: items as small as a bottle cap or as large as a two-liter bottle Atif Sayeed et al [4] For cleaning the beach, some cleaning machine must

be used so this cleaning equipment which helps us to clean the beaches in less investing hours. Public does not like to wait for long waiting hours just to get good surrounding Nurmin Bolong et al [5]. A robot adapted to a low budget. In the current context of environment protection and care, waste collector robots loom large, because they locate, collect and dispose garbage in a controlled, autonomous and fast way Shравan Singh et al [6] The research has not been carried out on beach cleaning machines because they are not widely used and the alternatives available in the market are quite less. The service machines for the purpose cleaning pools and households are being developed continuously but a cleaning machine for the beaches are not given much of an importance. The model developed comprises of a shovel with holes which picks the rags and leaves the sand behind.

III. DESIGNED METHOD

For the purpose of accomplishing the designated mission for the machine, the mechanical design was subdivided in different modules. Each module was designed with a specific task, which allows an efficient and practical way to manufacture, test and repair the components, maintaining the proposed model. The principal mechanical components of the machine are the body, drive train and wheels. A. Part description: The base rectangular chassis consists of four rubber wheels for the purpose of locomotion. A lower shaft is fixed on to a pipe which is at an inclination of 60 degrees. The lower shaft is provided with two plain bored sprockets. Similarly an upper shaft is also fixed to the same inclined pipe. The upper shaft is also provided with two bored sprockets and also provided with an attachment to which the motor shaft can be fixed for rotation. The motor used is a car windshield wiper motor which rotates the upper shaft. As the upper shaft is rotated due to chain sprocket setup the lower shaft is also rotated.

IV. WORKING

Machine is based on to convert electric energy to rotary motion. The machine is designed and manufactured by using Quick return mechanism and coupling shaft. It consist Of Battery, DC Motor, Wheels, chain, square tubes, pully, filtering tool, supporting frame, Bearing etc...The rotary mechanism is rotate with help of chain drive. Sand filtering tool is attached to the rotary mechanism then tool is rotate and collect the waste material. The beach cleaner works based on rotation of the chain and sprocket set. A low-speed high torque motor is attached to the upper shaft that drives the sprockets. The lifter mechanism consists of a chain sprocket arrangement coupled to the motor to drive the cleaning mechanism. The torque developed in the motor aids the claws in picking the rags from the sand. In addition to the torque, centrifugal force also acts on the chain. Due to the centrifugal force the chain will move away from the point of rotation that aids in smooth movement of chain over the sprockets. The device is place across a beach and sea so that only beach sand can get through the lower basement. Floating waste like bottles, plastic cans, covers any kind of waste etc. Is lifted by lifters which are connected to the chain. The chain revolves with the sprocket wheel which is driven by the motor. The energy provided to the motor is electrical energyThe bucket allow water to flow out as being perforated and only waste part will be collected into the storage collector behind the belt drive.

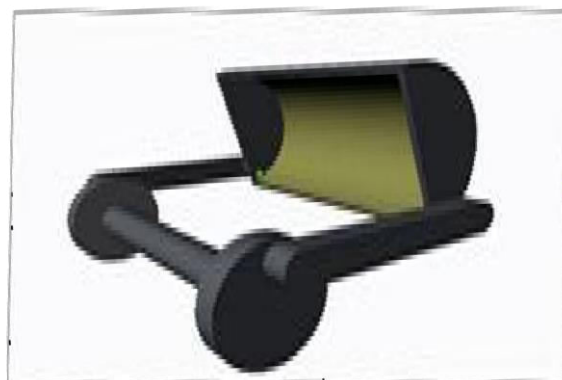




Fig.2 DC Motor



Fig.3 chain Drive



Fig.4 Frame

VI. CONCLUSION

In this paper, a Sand cleaning machine is designed and fabricated. This sand cleaning machine is used to clean the beaches sand. However, the machining time required for this sand cleaning is less as compared to the Manual work. Hence, the time consuming is less in the sand cleaning machine when compared to the manual work. The designed sand cleaning machine has been used for only trial production. In the future it would be used for Nagar parishad of near beaches.

REFERENCES

1. Vivek Dhole, (April 2019) "Design and fabrication of beach cleaning machine" IRJET.
2. R. Ram Moorthi, (October 2019) "Design And Fabrication Of Beach Cleaner", IJITEE.
3. C. Balasuthgar, (April 2020) "Design and Fabrication of Beach Cleaning Machine", ICAME.
4. Atif Sayeed, (February 2022) "Design and Analysis of sustainable beach cleaner", GDIALP.
5. Nurmin Bolong, (May 2021) "Manufacturing Beach Cleaning Machine Of Prototype Design", TOST.
6. Shравan Singh, (July 2021) "Semi Automated Floating Debris Cleaning Robot", JETIR.
7. Ankita Paste, (March 2022) "Smart Beach Cleaner Vehicle", IJRTC.
8. Pharhan Khan, (April 2022) "Automated beach cleaning machine", IJAEM.
9. Amey Jadhav, (04 April 2022) "Beach cleaning robot", IJCRT.
10. D.U.Kulkarni, (05 May 2022) "Beach cleaner", IRJMETS.



INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

 9940 572 462  6381 907 438  ijirset@gmail.com



www.ijirset.com

Scan to save the contact details