

# Semi Automated Wireless Beach Cleaning Robot Vehicle

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**Abstract:** This research work proposed is design and fabrication of Semi Automated Wireless Beach Cleaning Robot Vehicle. The work has done looking at the current situation of our beaches which are dump with core litters of dirt and encumbered with pollutants, toxic materials, debris etc. By taking this into consideration, this machine has designed to clean beach surface. Almost all the manufacturing process is being automated for delivering the products at a faster rate. Automation plays an important role in mass production. In this research work we have fabricated the river cleaning machine which is remote operated. The major focus of this research work is to decrease the man power, time consumption for cleaning the river. In this research work we have done the automation of the river cleaning with the use of motor and chain drive arrangement. Here we are using transmitter and receiver of RF type to control the cleaning machine. Computers, pneumatics, robotics, hydraulics, etc., are used for Automation. Among these sources, pneumatics used for low cost automation

**Index Terms:** Automation, Cleaning, Waste, Robot

## I. INTRODUCTION

“Cleanup machine for Beach” used in places where there is debris of waste in the water body which needs to be cleaned. The equipment consists of conveyer mechanisms which collect & remove the trash & synthetic wastages from beach surfaces. It reduces the challenges what we face during the collection of trash. 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. It consists of a mechanism with drives using belt which lifts the objects from the surface. The use of this research work will be made in lake, pond, river, sea and other water sources for to clean the trash from bodies. There are lots of troubles due to water contamination.

Derbies of waste is defined as the used water from houses, factories, commercial places like malls, restaurants and organizations which has to be treated by a technically planned and a system of pipes. The major consequence of cleaning the wastes chemical forms the basis of respiratory diseases and it becomes a problem for the workers. Water damage is divided in to 3 types of polluted water. They are water which is clean, water which is grey and water which is black. Water which is clean is from a water supply line which is broken or faucet

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which is leaking. If this is not cleaned immediately, the clean water can change into water of black or grey, depending on time length, temperature, and contact with contaminants in the surrounding. A drainage ditch is a channel which is narrow that is dug on the side of a field or road to carry away the water.

Mechanization is becoming a major role in all the applications in the sewage disposal from industries and cleaning of Sewage is a tough job. Waste water pipes are used for the sewage disposal and sometimes there may be human life loss while checking the problems in the waste water pipes. The workers of municipality are only responsible to ensure that the waste matter is uncontaminated or not. Though they clean the drain of the buildings, they can't do the work in the large sewages. The workers of municipality have to get down into the dirt to clean the debris. This will infect the health and causes skin allergies.

## II. WORKING PRINCIPLE

The major objective of this research work is designing the beach cleaner, by considering various factors which will influence the performance of the machine. The model is fabricated and the model is assembled, and then the procedure is studied and optimization is done for effective semi automatic wireless controlled beach cleaner. In this research work the major task of this equipment is to remove the trash from the surface of the beach and discard them in the tray. Here we are fabricating the river cleaning machine which is remote operated.

The chain drives and collecting plates are rotating by the motor continuously. A collecting plate which is coupled between the two chains drives for collecting the materials which are waste from river. The wastes which are collected are thrown on the collecting tray with the use of conveyer. Our research work is having DC motor with wheel arrangement which is used to control the model. The electrical device is controlled by RF transmitter and receiver which are used to manage the machine remotely.

## III. LIMITATION OF EXISTING MODEL

The system which is used in drainage cleaning mechanical arrangement doesn't have arrangements to operate or control. This is why most of the existing models only related to the name of drainage cleaning system.



## IV. PROPOSED MODEL

Floating waste like bottles, plastic cans, covers etc., are lifted by lifters which are connected to the chain. The motor drives a chain. The chain is revolving with a sprocket wheel. The lifter will be going in the upward direction when motor starts running. The trash and debris are picked up by the teeth of the lifter and dumped in a bin. This planned model is comparable to a car which is operated remotely using Radio frequency module receiver and transmitter.

## V. EXPERIMENTAL SETUP

This research work consists of a wheel which is operated by motor. It is having three Direct current Motor. The machine used for operating the model is a drive which is of chain type and is having a collector plate. The model is having two shafts. The Shafts are used for the purpose of hoisting and to balance the chain drive sprocket. The parts resting on the structure is the important feature of the model. The steel pipe with connection of dc motors will run the model even in irregular surfaces. The collecting tank is used to stock the debris satisfying the principle of the machine. Fig.1 and Fig .2 shows the model Top view and model front view.

### Selection of Chain Drive and Sprocket

- Determine the velocity ratio of the chain drive  
Ratio of Velocity =  $S1 / S2$   
So,  $S1 / S2 = T2 / T1$ , Ratio of Velocity = 1
- Choose the least number of teeth on the smallest pinion or sprocket. Least number of teeth on the Sprocket = 18

### A. Permanent Magnet DC Motor

30rpm centre shaft Direct Current motor is geared to a DC motor which is of high quality and low in cost. It is having gears and pinions are made of steel material to assure longer life and to withstand wear and tear. The gears are having mirror finish and they are fixed on spindles which are of steel material. The shaft used for output is rotating in a bushing of plastic material. Ring made of plastic material covers the assembly. Gearbox requires low maintenance.

### B. Spur Gear

Parallel shafts are used for mounting spur gears. Spur gears are having straight teeth.

Spur gears are popular because the design is simple, easy to maintain, easy to manufacture. Large stress is created on the spur gear due to its design.

### C. Wheel

A wheel rotates on a bearing which is axial. The wheel is the key part of the wheel and axles.

Wheels combining with axles are used to transport or move a heavy weight, support a load and perform labor in machines.



Fig 1: Model Top view



Fig 2: Model Front view

## VI. ADVANTAGES

- Initial investment cost is low.
- Cost for maintaining is low
- Skilled Worker is not necessary to operate the machine.
- The machine is environment friendly.
- The machine is easy to operate.

## VII. RESULTS

Semi Automated Wireless Beach Cleaning Robot Vehicle is used to reduce water pollution in beaches & rivers. The model is also applicable for public areas like malls, temples, bus stops and railway stations.

## VIII. CONCLUSION

Due to the automation of machines, many systems are becoming unmanned. Automatic machines are very much useful in places which are hazardous to human. The Semi Automated Wireless beach cleaning robot vehicle is very helpful in automatically removing the debris. It will reduce the direct human intervention and prevent the spread of diseases.

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