

RIVER CLEANING ROBOT

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Abstract -

The proposed concept is to replace the manual work in gutter cleaning by automated gutter cleaning system. Nowadays even though mechanical drainage plays a vital role in all domestic and industrial applications in the proper disposal of sewage from domestic, industries and commercials are still a challenging task. Drainage pipes are used for the disposal and unfortunately sometimes there may be loss of human life while cleaning the blockages in the drainage system. The Automated Gutter Cleaning system is a machine which helps to protect the environment from different kinds of environmental hazards through the promotion waste management by the removal of garbage from the drainage system. These wastes when not removed end up settling in residential places where these wastes are burnt thereby causing climate change otherwise these wastes block the drainage systems thereby causing flooding. In this project the proposal concept is to replace the manual work in drainage cleaning by automated system. We know that water has a great importance in human being life, the water flow in drain full of wastes like polythene, bottles etc. The gutters get blocked due to these wastes in water. To overcome this problem and to save human life we implement a design "Automated Gutter Cleaning system" and we have designed our project to use this in efficient way to control the disposal of wastages and with regular filtration of wastages.

Key Words:

1. INTRODUCTION

Water is being used very fast in today. The significance of water is mainly used for cooking, cleaning and drinking in our lifestyle. The water used in the factory and the house comes from the drains and reaches in the rivers, in the ponds and in the oceans. In which more solid ingredients (polythene, bottles etc.) Along with water also reaches. We have built automated drain cleaning machine with the main purpose of removing these solid materials from drains. This machine can be established at any point of drain very easily. It has been design in such a way that its lets water flow through it but collects all the solid substances and gives a group in the dustbin. This machine is able to do cleaning and moving process together on the drains/gutters. The Drainage water cleaner system are used to clean wastes from water like polythene, bottles etc. present in water. This can be used to overcome the problem of filtration of wastes from water and it save the time and cost that spend on cleaning the drainage. As the industry setup increase in the environment the water coming from industries are full of wastes like polythene, bottles, and other materials and that water mix with the other

water that are used by people and we know that that water is not good for the for health of people. So to overcome from these problems we can filter the water drainage water before it mix with other water. This type of filtration of water is called primary filtration. In this project we use DC or AC motor to run the system when power supply is available & the Equipment we used are motor, chain, driver, bucket, frame, wheel, sprocket gear, solid shaft etc. Water is a basic necessity of human and all living beings.

It includes washing machine overflow; toilet overflow with some urine, and dishwasher overflow. Black water is grossly contaminated and could cause severe illness or death if ingested and avoided such as flooding from rivers or streams, water from beyond the toilet trap, water from the toilet bowl, or standing water that has begun to support microbial growth. A drainage ditch is a narrow channel that is dug at the side of a road or field to carry away the water. Nowadays, even though automation plays a vital role in all industrial applications in the proper disposal of sewage from industries and sewage cleaning is still a challenging task. Drainage pipes are used for the disposal of sewage and unfortunately sometimes there may be loss of human life while cleaning the blockages in the drainage pipes.

2. LITERATURE REVIEW

[1] As we know the cleaning of water is our primary purpose so cleaning of water is done manually till now. When human clean gutters manually, then there are more health issue which damage the human health. So we have invented a machine which clean gutters automatically and saves the human life and also various living organisms to many type of diseases. Ganesh U L, showed the usage of mechanical drainage cleaner to replace the manual work required for drainage cleaning system. Drainage pipes are very dirty. Sometimes it is harmful for human life while it is need for cleaning drainage system. To overcome this problem, they implemented mechanical semi-Automated drainage water cleaner and so the water flow is efficient because of regular filtration of wastages with the help of that project. Different kinds of environment hazards reduced with the help of Drainage system machine.

[2] James C. Conwell, G. E. Jhonson proposed the design and construction of a new test machine configuration that offers

same advantages over the traditional one. The new machine and attendant instrumentation provide more realistic chain loading and allow link tension and roller sprocket impact monitoring during normal operation. The incorporation of idle sprocket allows independent adjustment of test on length and preload.

[3] S D Rahul Bharadwaj, Proposed with the automatic cleaning of waste water in order to prevent global warming and melting of glaciers. The results emphasize the need of waste water treatment plants, through which the water is treated before suspending in rivers. Firstly power is generated and that power is used for waste water cleaning process.

[4] Balachandraetal, Reviewed about drainage cleaning to replace manual work to automated system because manually cleaning system it is harmful for human life and cleaning time, is more so to overcome this problem they implemented a design—Automated drainage water pump monitoring and control system using PLC and SCADA. PLC and SCADA were designed.

3. TECHNICAL SPECIFICATION

1. Shaft

A shaft is a rotating machine element, usually circular in cross section, which is used to transmit power from one part to another, or from a machine which produces power to a machine which absorbs power. The various members such as pulleys and gears are mounted on it. Material used=Mild steel. Shafts are generally formed by hot rolling and finished to size by cold drawing or turning and grinding.

2. Motor



Fig.1: Motor

DC motors are designed to convert electrical power into mechanical power and as a consequence of this, during periods of deceleration or if externally driven, will generate electrical power. However, all the input power is not converted into mechanical power due to the electrical resistance of the armature and other rotational losses. These losses give rise to heat generation within the motor.

3. Battery

- Nominal battery voltage is 6V.
- 5Ah capacity at 20hr rate to 1.75VPC.

- Charging temperature range from -15°C to 50°C.
- Lead acid battery



Fig.2: Battery

4. Solar Panel

Photovoltaic solar panels absorb sunlight as a source of energy to generate electricity. A photovoltaic (PV) module is a packaged, connected assembly of typically 6x10 photovoltaic solar cells. Photovoltaic modules constitute the photovoltaic array of a photovoltaic system that generates and supplies solar electricity in commercial and residential applications. Here, the solar panel is being used to power the battery which is used for the application of power to the mechanism of Automated Gutter Cleaning system. It is a panel of 6 watts consisting of photovoltaic solar cells. Per hour solar panel charges 6 watts of power. Since to charge the panel of 6watts it will consume 150 minutes approximately depending on the sunrays falling on the panel.



Fig.3: Solar panel

4. WORKING

The devices is place across drain so that only water flow through lower grids, waste like bottle, Etc. Floating in drain are lifted by teeth which is connected to chain. This

chain is attached by gear driven by motor. When motor runs the chain starts to circulate making teeth to lift up. The waste materials are lifted by teeth and are stored in waste storage tank. The lower shaft and wheel arrangement is placed for transporting the machine from one place to another place as well as one gutter to another gutter. The upper shaft and wheel arrangement helped for moving the machine during cleaning process. Means this gutter and drain cleaner clean and move together for better cleaning of gutter. Reduce, reuse, recycle. Reducing the quantity of waste that must be transported and disposed of should be a primary goal of all municipal solid waste management programs. Waste should be recovered at the source, during transport or at the disposal site. The earlier the separation, the cleaner the material, and, in the end, the higher its quality and its value to users. Incentives which integrate and foster the involvement of the informal sector— itinerant collectors, microenterprises, cooperatives—can be essential to improved waste minimization.

5. CONCLUSIONS

In the treatment system of drainage, waste water control by the machine and the collecting bin to achieve automatic control of waste water treatment. Drainage from domestic and industries is treated through this project to meet the national emission standards, with stable operation, low cost and good effect. The cleaner functions more effectively during the heavier rains which have more volume of running water with garbage and high velocity. Risk of Labors catching infections or poisoning due to large amounts of waste and chemicals will be reduced. Automation is a technology concerned with his application of mechanical, electronic and computer based systems to operate and control production. This system is used To Operate Automated Gutter Cleaning System. This project may be developed with the full utilization of men, machines, and materials and money. Also we have followed thoroughly the study of time motion and made our project economical and efficient with the available resources. This system is Designed, Fabricated successfully and also tested. It works satisfactorily. We hope that this will be done among the most versatile and interchangeable one even in future. Thus we can able to obtain following through Automated Gutter Cleaning system.

5.1 Advantages

- This cleaning system is easy to operate and flexible.
- This system is Eco-friendly.
- This requires less manpower.
- This required more use of renewable energy Sources.
- This system is Cost effective (Initial and Maintenance costis low).
- This is efficient method

5.2 Applications

- Useful to reduce the water pollution in river
- It is applicable to reduce water debris, impurities, and all types of impurities
- Which are floating on the water surface in swimming pools.
- It is useful to remove the environmental marine pollution at Godavari River.
- It is useful in fishery plants to collect dead fishes.

5.3 Future Scope

We have done has a good future scope in any engineering industry. The main constraint of this device is the high initial cost but has low operating cost and can be adopted anywhere across the country at any time, any conditions for cleaning the gutters. Our project is simply a drain waste water cleaner machine, which is automatically operated. Following different modification can be done to improve the output and efficiency the device affords plenty of scope for modifications, further improvements & operational efficiency, which should make it commercially available & attractive. If taken up for commercial production and marketed properly, we are sure it will be accepted in the industry. It has plenty of scope if the device is made larger in size.

REFERENCES

- [1] IJRET : International journal of research in engineering and technology eISSN 2319-1163 | pISSN: 2321-7308
- [2] International journal of science and technology management and research volume 2 issue 2 febraury 2017
- [3] Internatinal conference on exploration and innovation in engineering and technology.
- [4] International journal of engineering science and computing may 2017 vol. 7 issue no. 5
- [5] https://en.wikipedia.org/wiki/Drainage_system
- [6] Theory of machines –S S Rattan Department of Mechanical Engineering Regional Engineering College Kurukshetra (2004). Publication: Tata McGraw-Hill Publishing company Limited.
- [7] Design of machine elements (DME-II) by K Raghavendra .first edition 2015.
- [8] Design and Data hand book for Mechanical Engineers by K Mahadevan and K Balaveera reddy. Fourth edition 2013.
- [9] James C. Conwell, G.E. Jhonson, —Design, Construction and Instrumentation of a Machine to Measured Tension and Impact Forces in Roller Chain Drivesl, December 1989.
- [10]S D Rahul Bharadwaj, Shraddha R Jogdhankar, —Automated Wastewater treatment process to reduce global warmingl International Journal of Environmental Science: Development and Monitoring, Vol No- 2 (2013).