Design and Fabrication of Automatic Gutter Waste Collector

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***Abstract*:- The proposed concept is to replace the manual work in gutter cleaning by Automated gutter cleaning system. Now-a-days even though mechanical drainage plays a vital role in all domestic and industrial applications in the proper disposal of sewages from domestic, industries and commercials are still a challenging task. Drainage pipes are using 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 protectthe environment from different kinds of environmental hazards through the promotion waste management by the removal of garbage from the drainage system. In this project the proposal concept is to replace the manual work in drainage cleaning by automated system. 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 wastagesand with regular filtration of wastages.**

1.INTRODUCTION

Water is the basic necessity of any human or living being. Earth is covered with 71% of water and out of which 99.7% is in the oceans, soils, icecaps, and floating in atmosphere and only 0.3% is available for human use. So we have come up with idea of reusing the waste water that flows into the drainage system and blockages of the drains can be avoided. As there is lot of solid waste that flows in to drainages and blocks the pipelines .In India, there is no existing automated mechanism by which this blockage of drainage can be removed. Currently these blocked drains are cleared with the help of manual workers were the workers have to get into the drains and manually remove the wastes. In such situations the rate of diseases spread among these workers are high and this affects their life's and reduces their immunity. As a solution to theses social relevant problems and as a solution to the health issues caused thereby, we propose an automated mechanism, "Automatic Drainage Cleaning Machine". This project is designed to keep the drainages clean and helps in smooth functioning of drainage system. This project is very compact when compared to other municipal machineries used to drain out the wastes. It also reduces labour work and improves the quality of water that is cleaned. Mechanical controlled techniques can likewise be utilized to speed up the manual cleaning exercise including handpicking, racking, and cut stamp control with the utilization of engine driven hardware.

2. PROBLEM STATEMENT

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.

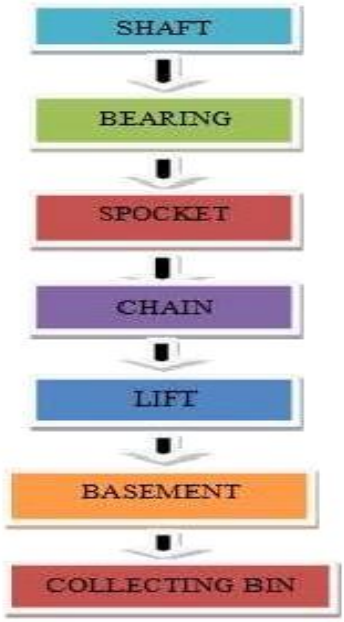
3. LITERATURE SURVEY

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 efficientbecause of regular filtration of wastages with the help of that project. Different kinds of environment hazards reduced with the help of Drainage system machine.

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.

Dr.k.kumaresan explained manual work converted to automated system. Drainage pipe using for disposal and it may be loss for human life while cleaning the blockage in the drainage pipes. To overcome this problem they implemented "Automated Sewage Cleaning System". They designed their project different way clearance of gaseous substance are treated separately so the flow of water efficiently. This project may be developed with the full utilization of men, machines, and materials and money. They made their project economical and efficient with the available resources. They used automation technology related with his application of mechanical, electronics, computer based systems to operate and control production.

4. DESIGN OF MECHANICAL CLEANING SYSTEM



5. SYSTEM DESIGN INPUTS

COMPONENT	QUANTITY	MEASUREMENT
shaft	2	diameter= 23 mm
chain	2	length=1430 mm
collecting jaw	2	length=330mm
collecting bin	1	length= 450 mm breadth=430 mm height=110 mm

6. FABRICATION OF MODEL

Fig 1 Fabrication of the model

Basically during fabrication of the model the basement part is prepared by welding the metal bars by electric welding. Then the supporting rods are welded at an angle of 90 degree from the basement, the pillow block bearings are fixed to the supporting rod and the front part of the basement. Hollow cylindrical shafts are fixed to the bearings and also chain drive are also fixed to the shaft in order to fix the shafts the factor of safety of the chain is calculated. The lifters are fixed to the chain by gas welding at an equal distance from each.

7. WORKING PRINCIPLE

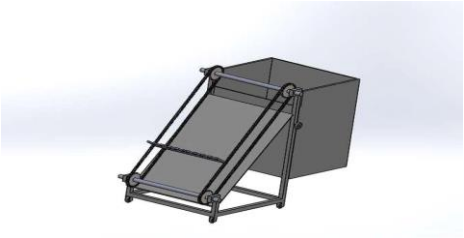


Fig 2 Working principle of automatic gutter collector

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.

8. CONCLUSION

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 has more volume of running water with garbage and high velocity. Risk of Labours 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.

9. REFERENCE

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