

AUTOMATIC DRAINAGE CLEANING SYSTEM

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Abstract

In this project the proposed concept is to replace the manual work in drainage cleaning by mechanical drain cleaner. There is a huge demand of clean water, as it is used for a variety of purpose such as drinking, bathing, cleaning, cooking etc. Impurities present in water can cause serious health issues that can damage the life of human beings. Water is the basic need for the existence of life on earth. In spite of 70% water on earth majority of water is not suitable for drinking purpose. Now-a-days even though mechanical drainage plays a vital role in all industrial applications in the proper disposal of sewage from industries and commercials are still a challenging task. Solid waste in drainage water includes empty bottles, polythene bags, papers etc. The drains get blocked due to these wastes in water. Drainage are using for the disposal of waste and unfortunately sometimes there may be loss of human life while cleaning the blockage in the drainages. 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. Therefore the chief function of the automatic drainage cleaning system is to collect, transport, as well as dispose the solid waste in the waste bucket by the help of claws. So that the waste is collected by the conveyer and they are transported to the bag behind and disposed.

Introduction

Drainage is the natural or artificial removal of surface and sub-surface water from an area. As long as the draining system is considered the function of the main drainage system is to collect, transport and dispose of the water through an outfall or outlet. Impurities in drainage water can be only like empty bottles, polythene bags, papers.....etc. These impurities present in drainage water can cause blockage or the drainage system. The drainage system can be cleaned time to time manually or such a system can be designed that will automatically throw out wastages and will keep the water clean. This project is designed to keep clean the drainage system and helps the smooth working of the system. This project automatically cleans the water in the drainage system each time any wastage appears and this

form an efficient and easy way of cleaning the drainage system and preventing the blockage. It also reduces labour and improves the quality of water that is cleaned. If the garbage are allowed to flow they will end up flowing down to recreational beaches used for tourism purposes making a scene not pleasurable to the eyes else these garbage flow to residential sites where they are burnt in a way of getting rid of them, thereby causing climate change. The drainage systems are cleaned when there is no water in them i.e. when it is not raining, but when it is raining the drainage systems cannot be cleaned because of the harsh conditions

Literature review

Ganesh U L, et.al. 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-automatic 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. Elangovan K., et.al. 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 “Automatic drainage water pump monitoring and control system using PLC and SCADA”. PLC and SCADA were designed. In this project to use efficient way to control the disposal of wastage regularly, NDUBUISI C. Daniels, et.al. Showed the Drainage system cleaner machine used to remove garbage and sewage automatically which helped to protect the environment from different kinds of environmental hazards. The drainage system cleaner has three major parts which are the Propeller, the Cleaner and the Pan all makes up for its effective functioning. Shao-Wu-Zhang, et.al. introduced three drainage devices about the ceramic filter dewatering system, improved the design according to the short coming of drainage device and working mechanism of automatic drainage device. This device has stable performance, low cost and low failure rate. They compared the working processes of three drainage devices, and analyzed its future development. Their aim was the shortcomings of the three types of drainage devices and their application situations; the automatic drainage device was improved. Prof S.D. Anap, et.al. , showed blockage is the major cause of the pollution and flooding in the metro cities. They have designed the drainage blockage detection system to avoid such problems. The system provides monitoring of drainage condition and to inform authorities of this condition. This design preset an implementation wireless sensor network in the monitoring of drainage system using GSM system. To detecting blockage and monitoring

water level condition we use level sensor. They explained about the design of the cost effective, easy method to control the water level of the tank wirelessly and automatically. They used level and IR sensor to monitor and control drainage blockage. They also used solenoid valve for bypass purpose. James C.Y. Guo, et.al. showed roadway sanding is a common practice in cold regions because sand increases the roadway friction when mixing with snow. In this study, a snow storage element is introduced to the renaissance project of a mountainous highway which is running through an environmental sensitive forest area in Colorado. Recovery of winter sanding material from the highway was designed to be a joint effort of surface runoff and sweeping machines. As a trade-off exist between sand recovery and size of snow storage area. This study also presented a maximization methodology by which the size of snow storage area can be determined by the diminishing return of sand recovery. 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. N.Prabhushankar, et.al. showed dewatering of drainage is generally done using centrifugal pump, but using centrifugal pump is not much effective in complete removal of the suspended and heavy solids and also it consumes lot of electric power for its operation. The main aim of the discussing significant contributions. Some problem areas needing further attention of researchers are also presented. They framed better methodology for structural analysis for mechanisms including detection of isomorphism and inversion. They also motivated to current researchers in the field of fascinating.

Methodology

The device is place across a drain so that only water flows through the lower basement. Floating waste like bottles, plastic cans, covers.....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 energy. When motor runs the chain starts to circulate making the lifter to lift up. The wastage material are lifted by lifter teeth and stored in storage or collecting bin. Once the collecting bin is full, the waste materials are removed from the bin. Further they are replaced in various size of our convenience. There by it works as the flow of water, it could be further scoped as to create a water flow in stagnant water so that the waste are made to flow in the path to our conveyer.

Fabrication

These are the preliminary setups done for the manufacturing of our machine.

Steps in the manufacturing

The design and the measurements were made perfect and the model prototype was made, the leg and the post were measured and they were made in perfect perpendiculars as they don't come out of centre of gravity.

Then the cutting plan was done and the raw materials were made in sizes as the cutting plan. Then the sheet was made into sizes and they were welded. Then skeleton was made to hold the conveyer. As the conveyer merges in water they were choose as stainless steel and the mesh work was done as they must allow the water flow and collect only the waste in water.

Then the bearings were fixed in the shaft, and the chain sprocket was mounted on the shaft.

The chain was chose since to the slip in waster to be arrested, and then the drive was chosen as ac motor also the belt drive is used. The rpm of the motor is 6000, and the speed is to be reduces to collect the waste in water so that the regulator is used coz the resistance is adopted to reduce the current ultimately the speed is reduced.

The conveyer buckets are made and placed in 3 numbers as 180,180, 180 degree of separation. This could be done to increase the efficiency of collection of the waste .further the increase in the numbers of conveyer the efficiency of the machine will be increased.

Further the height of the project is increased by adding the leg height as the could be fastened.

Since the tunnel and the drainage may be complicated in the texture so our project is made as parts i.e. the segments are made and so they could be dismantled and the reassembly as needed in the required project

Conclusion

In the treatment system of drainage Waste water control by the motor, roller chain and sprocket, lifter and the collecting bin to achieve semi-automatic control of sewage waste water treatment. Drainage from industries is treated through this project to meet the national emission standards, with stable operation, low cost and good effect. Drainage wastewater

control is treated by this method to irrigate plants, clean toilets, etc. 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 AUTOMATIC SEWAGE CLEANING EQUIPMENT. 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 was 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 AUTOMATIC SEWAGE CLEANING EQUIPMEN The cleaner functioned move effectively during the heavier rains which had more volume of running water with garbage and high velocity.

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