



FABRICATION OF AUTOMATIC DRAIN CLEANER

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ABSTRACT:

Mechanical drain cleaner plays a vital role in industrial and commercial applications for proper disposal of sewages. Sometimes people may lose their lives while cleaning the blockages in the drainage system. To overcome this problem and to save human life we implement a design up automatic drain cleaner and to handle the wastage disposal in an efficient way. Drainage cleaning system is a machine which helps in protecting the environment from different kinds of pollution.

When these wastes are not removed may lead to drainage blocking thereby causing flooding. In this project the proposal concept is to replace the manual work in drainage cleaning by automated system. The power motors are connected to the wheel and it is driven with the help of remote control setup. The process starts collecting the sewage wastes by using the arm and it throws back the waste into the bin fixed in the machine. An arm is used to lift the sewage and in turn a bucket is used to collect them. Wastages which floats on the water surface also gets collected. This system of cleaning process and in turn reduces spreading of diseases to mankind.

KEYWORDS:

ARDUINO UNO, BATTERY, IR SENSOR, GSM, WIPER MOTOR, CHAIN AND SPROCKET MECHANISM, RACK AND PINION, CRANK.

INTRODUCTION

In this research paper the proposed concept is to replace the manual work in drainage cleaning by automated system. Now a days in all industries the work takes place automatically this is necessary to all the industries without any system efforts. The work is going on by using automatic technique. In present days however automation plays an important role in all industry applications. Disposal of sewage waste from industries is a difficult job. This is one challenging task in industries and commercials. In older days people were using drainage pipes because they use to remove sewage water. There is a disadvantage which may be loss of human life when work in that drainage pipes is going on while cleaning the block. To reduce this problem and to save human life some external work is done in this project. The device is placed across drain so that only water flow through lower grids contain waste bottles paper etc are lifted by teeth which is connected by chain.

The chain drive is used for lift up the waste from the drain to waste storage tank. Power is supplied to the chain drive by the dc motor. The waste materials is separated by

bucket and are in stored in the waste storage tank whenever the bucket is lifted up from the drain, with the help of dc motor. Dc motor control plays a major role in many applications. Whenever the motor is run automatically drainage water cleaning overcome all the short of drainage problem and promote blockage free drain progress continuous flow of drain water. In the modern era there have been sufficient sewage dross problem when dross water need be separated to clean surrounding area. The waste and gases produced from the industries are very harmful to human beings and to the environment.

Methodology used for whole processing of drainage cleaning machine is give below; this methodology gives way about how work is to be carried out in systematic direction. It is standard process of describing process, how it is done in simplest manner.

LITERATURE SURVEY:

- R.Sathiyakala (2016) proposed the smart cleaning system. Here, smart arm and E-Bucket plays an important role. Such as smart arm is used to lift the sewage. And the E-bucket (Electronic bucket) support evaporation of the water from waste & convert it into dry matters. This is also preventing the mosquito generation from the wastage. Smart

cleaning system is also an automatic functioning system. There, the above processes are performed spontaneously with the help of ARM board (ARDUINO). After the evaporation process the waste is easily add with government wastage bank by the street cleaning sweepers without any kind of affection of the Bactria's and the sewage flues from the waste.

- Ganesh U "Semi-Automatic Drain For Sewage Water Treatment Of Floating Materials", (2016) He proposed 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
- Balachandra "Automatic Drainage Water Pump Monitoring and Control System Using PLC and SCADA" (2014) published in the Proceedings of the National Academy of Sciences (PNAS) found that at least 88 percent of the Earth's water surface is polluted with plastic debris. The result is not just a number, it says the contamination level of water. All the plastic wastes are of less density and so they float. The wastes also block the water path at narrow regions. The floating waste reduces the absorption amount of sunlight by water which results in imbalance of aquatic system. The reduction of this level of contamination is a very difficult one. And we cannot employ humans to clean the floating wastes because it may cause severe problems. We can overcome this problem by using a machine in that field. Our project is about automatic sewage cleaning machine, which can be used to clean the solid floating wastes that may be plastic or any other lighter waste materials. There are two parts mechanical & electronics. Mechanical system performs the lifting, moving & throws the waste by the power of motor. Electronics part of this controls the speed, frequency of the mechanical components.
- S D Rahul Bharadwaj, Shraddha R Jogdhankar, March (2013) stated that global warming is an ever increasing problem of earth as glaciers are melting rapidly. There is an urgent need for some sort of solution for the problem. This project is not the 100% solution, but it will improve the condition up to a certain extend. The main object of the present project is to provide an assembly which may be used within a wastewater treatment facility. The source, which is going to be used, will always available hence; the process will be continuously going on. Hence we can say that the above project is one of the economic and suitable for the water treatment in order to reduce the global warming.
- NDUBUISI C. Daniels (2014) develops Drainage

System Cleaner 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. The machine is designed in such a way that it generates motion for its functions by itself through the action of running water thereby cutting out the dangers of the powering the machine by other sources of power because of the harshness of the rain on these other sources. The drainage system cleaner has three major parts which are the Propeller, the Cleaner and the Pan all make up for its effective functioning. The Drainage system cleaner was tested on three different days in the first day it rained in the months of September, October and November 2012 respectively. Based on the findings made after the test the Drainage system functioned well when there is maximum load. I therefore recommend the use of this system by various individuals, government companies and waste recycling companies for prevention of environmental hazards and also encouraging waste management.

- Nitin SallJuly (2016) develops Drain Waste Water Cleaner, 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. 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. Wastewater is characterized as the stream of utilized water from homes, organizations, ventures, business exercises and foundations which are subjected to the treatment plants by a precisely planned and built system of funnels. The measure of stream dealt with by a treatment plant shifts with the season of day and with the times of the year. The procedures looked into here incorporate both those that expel poison soils in wastewater and those that vanishes them. Utilizing a wastewater treatment innovation that expels, instead of decimates, a toxin will give a treatment remains. This sort of wastewater is characterized and characterized by its wellsprings of cause. Regularly 200 to 500 liters of wastewater are created for every individual associated with the framework consistently. At wastewater treatment plant, this stream is dealt with before it is permitted to be come back to the earth. There are no occasions for wastewater treatment, and most plants work 24 hours each

day of the week. A waste water treatment plant takes a shot at basic purpose of the water cycle, helping nature shields water from the intemperate contamination. Most treatment plants have essential treatment and auxiliary treatment.

RESULTS:

The Results section should include the rationale or design, optimization, validation of the experiments as well as the results of the experiments.

DISCUSSION:

Discussion section should focus on the interpretation of the results with proper justification. The Results and Discussion sections may be combined into one section.

CONCLUSIONS:

Modern services are becoming polarized. With the emergence of more and more automatic terminal services, modern services are also gradually becoming unmanned. Thus this semi automated sewage cleaning system helps in cleaning the sewage automatically and helps in decreasing the spread of diseases due to direct human intervention into the sewage. Integrating features of all the hardware components used have been developed in it. Presence of every module has been reasoned out and placed carefully, thus contributing to the best working of the unit. Thus the project has been successfully fabricated and tested.

MATERIALS AND METHODS:

SIZE, MATERIAL OF CONSTRUCTION DETAILS

Size of drain cleaner depends on size of drainage, material of construction of drain cleaner and availability of material in market. To find average sizes, dimensions and material of construction of different drainages the Performa was filled. Different dimensions such as dimensions of wheel, sprocket axles, carrier etc. Hence these drain cleaner are not designed considering the basic design considerations. To get the general idea about the prevailing design details of these drain cleaner some measurements such as distances between front and rear wheels, chain and sprocket, frame and ground clearance at front and back were noted.

SPECIFICATIONS OF DRAIN CLEANER:

Sl. No	particulars	Specifications
1	Frame Frame material	Fixed GI PIPES
	Overall length of frame, mm	1152mm
	Width of the frame, mm	576mm
	The height of drain cleaner up to axle, mm	609.6mm

2	Axle Material of the axle Length of the axle, mm Size of axle, mm	Mild steel round pipe 711mm Dia25.4 mm cylindrical dia
3	Wheel Type of wheel Number and size of the wheel, mm Size of the hub, mm Method of fixing to axle	Plastic with hard rubber wheel 4 and, dia139.7mm dia, 15mm bolt and nut
4	Ground clearance, mm	From axle 76.2mm From base 152.4mm
6	Collecting bin Length, mm Width, mm Height, mm	558.8mm 406.4mm 254mm
7	Bearings Material of the bearing Ball bearing No of ball bearing	bearing material 60.9dia in mm number 07
8	Rack and pinion Material Rack length, mm Rack width, mm Pinion diameter, mm	Cast iron 457.2mm 12.7mm 38.1mm
8	Overall length of the drain cleaner, mm	1524mm
9	Overall width of the drain cleaner, mm	711mm
10	Overall height of the drain cleaner, mm	762mm

TOOLS REQUIRED

- Material cutter
- Steel Tape
- Try Square
- Vernier Caliper
- Chipping hammer

OPERATIONS:

A grinding machine, often shortened to grinder, is any of various power tools or machine tools used for grinding, which is a type of machining using an abrasive wheel as the cutting tool. Each grain of abrasive on the wheel's surface cuts a small chip from the work piece via shear deformation.

Welding is a fabrication or sculptural process that joins materials, usually metals or thermoplastics, by using high heat to melt the parts together and allowing them to cool

causing fusion. In addition to melting the base metal, a filler material is typically added to the joint to form a pool of molten material (the weld pool) that cools to form a joint that, based on weld configuration (butt, full penetration, fillet, etc.), can be stronger than the base material (parent metal). Pressure may also be used in conjunction with heat, or by itself, to produce a weld. Welding also requires a form of shield to protect the filler metals or melted metals from being contaminated or oxidized.

A drill is a tool primarily used for making round holes or driving fasteners. It is fitted with a bit, either a drill or driver, depending on application, secured by a chuck. Some powered drills also include a hammer function.

Drills vary widely in speed, power, and size. They are characteristically corded electrically driven devices, with hand operated types dramatically decreasing in popularity and cordless battery powered ones proliferating.

Drills are commonly used in woodworking, metalworking, machine tool fabrication, construction and utility projects. Specially designed versions are made for medicine, Space, and miniature applications.

It is a type of welding that uses a welding power supply to create an electric arc between a metal stick ("electrode") and the base material to melt the metals at the point of contact. Arc welders can use either direct (DC) or alternating (AC) current, and consumable or non-consumable electrodes.

A lathe is a machine tool which is used to rotate a work piece to perform various operations such as turning, facing, knurling, grooving etc., with the help of tools that are applied to the work piece.

CONCLUSION:

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