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Design and Manufacturing of Drainage Cleaning System

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Abstract

During this project, the proposal concept is to switch the manual add drainage by drainage cleaning system. Wastewater is characterized because the stream of utilized water from homes, organizations, ventures, business Exercises,etc. Drainage pipes are used for the disposal and unfortunately sometimes there could also be loss of human life while cleaning the blockage within the drainage pipes. The motive of the project is to implement a system for sewage cleaning process in drainage, to scale back the spreading of diseases to human. It improves the period of time and sensory quality of food products and also helps to stop the mosquito generation from the wastage.So as to get rid of a specific amount of solid waste and undesirables from the waste water we use the gutter cleaning machine which is meant to as a check point at various focus points where the waste gets accumulated.

Keywords— *Chain, Drainage, Gear, Blockage, Disposal, Battery , waste water,shaft.*

I.INTRODUCTION

Water may be a basic necessity of humans and every one living beings. there's a lots of water on earth but that's not suitable for human use. Clean water is more important and is employed for a few purpose. The impurities present in water can cause hazardous diseases. Impurities in drainage water will be like empty bottles, polythene bags, papers etc. House drains empty themselves into the most drains which run under the most streets and below many lanes. Solid matters that are created by human or animal activities, and which are disposed because they're hazardous or useless are referred to as solid waste. Most of the solid wastes, like paper, plastic containers, bottles, cans, and even used cars and electronic goods aren't biodegradable, which implies they are doing not get lessened through inorganic or organic processes. Thus, after they accumulate they cause a health threat to people. Decaying wastes also attract household pests and lead to urban areas becoming unhealthy, dirty and unsightly places to reside in. Moreover, it also causes damage to terrestrial organisms while also reducing the uses of the land for other more useful purposes. Therefore, this problem needs immediate remedial measures. These impurities present in drainage water can cause blockage or the system. The system will be cleaned time to time manually or such a system will be designed which will automatically throw out wastages and can keep the water clean. This project helps to scrub water within the system whenever any wastage appears and this way an efficient and straightforward way of cleaning the system and preventing the blockage. It also reduces human power and improves the standard of water that's cleaned. The drainage systems are cleaned when there's no water in them i.e. when it's not raining, but when it's raining the drainage systems can not be cleaned due to the tough conditions of the rain which nobody would volunteer to confirm that garbage doesn't enter into the drainage systems. Our system uses a gutter/drain cleaning system that lets fluids flow through it but catches large solid waste like bottles, plastic and accumulates it. So gutter cleaners must just clean these gutter cleaning systems installed at points rather than cleaning entire gutter floors. We are visiting implement a system that uses a sequence drive system driven by a motor which is including battery.

II. LITERATURE REVIEW

1. NDUBUISI C. Daniels, et.al. Showed the system cleaner machine wont to remove garbage and sewage automatically which helped to shield the environment from different varieties of

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environmental hazards. The system cleaner has three major parts which are the Propeller, the Cleaner and also the Pan all makes up for its effective functioning.

2. R.Sathiyakala, explained E bucket (electronic bucket) use for drainage cleaning system because E-bucket lifted a sewage and used evaporation treatment for this sewage wet sewage was converted into dry matters, with the of ARM board (ARDUINO) this process was performed. After this process they were add this waste a government bank with none reasonably affection of the bacteria.
3. Balachandra et al, Reviewed about drainage cleaning to switch manual work to automated system because manually cleaning system it's harmful for human life and cleaning time, is more so to beat this problem they implemented a design "Automatic drainage pump monitoring and system using PLC and SCADA". PLC and SCADA were designed. during this project to use efficient thanks to control the disposal of wastage regularly, treatment of disposal in numerous way toxic and nontoxic gases. PLC controller from Siemens was employed in the treatment system of drainage wastewater control by the stepper motor, compressor, gas exhauster, pressure valve and also the liquid level, flow and other analog variables to realize automatic control of sewage waste water treatment. 4.Mohammad Idhris et al. implemented the automated remote controlled sewage cleaning system to resolve the matter of water logging because of plastic/thermocols and metal leads. this technique uses RF transmitter

   and receiver for remote controlled operation . Software implementation of electrical setup is meted out using proteus software for simulation.
4. Prabhushankar N et al. designed a machine which used reciprocating pump because the main component rather than pump for dewatering of drainages. As pump was costlier and fewer effective in complete removal of suspended and heavy solids. They used pneumatic and spring system with reciprocating cylinder. There was use of pneumatic cylinder which used power of compressed gas to supply linear motion with reciprocation. One component of pneumatic system was spring return pneumatic cylinder. One drawback with it had been less efficiency, as a part of force produced by cylinder was lost because it tried to push against the spring.

PROBLEM STATEMENT

To find an answer for the matter of water logging because of plastic thermocols metals etc. To treat problems like malaria typhoid etc. cased because of water accumulation.

WORKING PRINCIPLE

The device is placed 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.

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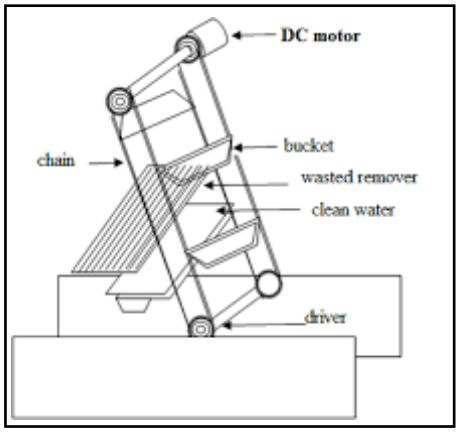

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Fig.1.Drainage cleaner setup V.DESIGN SPECIFICATION

1) **Frame** (Material Used: Mild Steel) Length : 450 mm
Height : 750 mm
L-angle channel- and frame: (25 x 25) mm
2) **Bearing** (Material Used: Stainless Steel) 6202 single row deep groove Ball Bearing
3) **Battery**
12 Volts, 7 Ampere, Lead Acid battery, Rechargeable type battery, Works for 2 Hrs.
4) **Sprocket** (Material Used: Cast Iron) Chain pitch:9.525 mm
Pitch diameter:46.019 mm Roller diameter:6.35 mm
Width between inner plate:5.72 mm Transverse pitch:10.24 mm
Outer diameter:49.77 mm
5) **Chain**(Material used:cast iron) Pitch:9.525 mm
Roller diameter:6.35 mm Width:5.71 mm
Transverse pitch:10.24 mm Root diameter:40.35 mm
Tooth side radius:9.525 mm Tooth width:5.434 mm
6) **Motor Shaft** Diameter:8mm Length:300mm
7) **Main Shaft** Diameter:15mm Length:300mm
8) **Motor:**
12 Volts, 18 Watt, 45 rpm DC motor
9) **Storage tank**(Material used:mild steel) Length:250 mm
Width:250 mm Height:200 mm

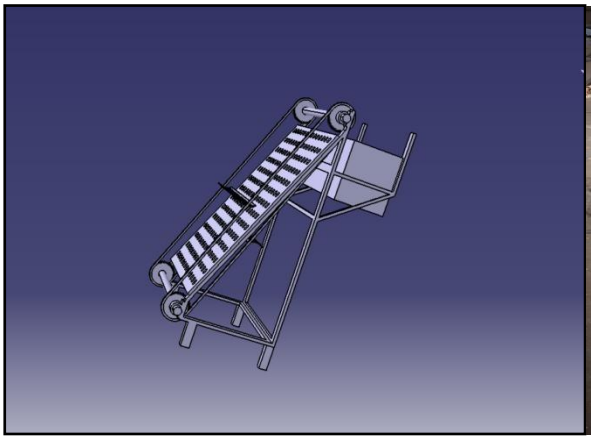

Fig.2.CAD model

Fig.3.Actual drainage cleaner setup

RESULT & DISCUSSION

While conducting the experiment the parameters should be considered as uniform flow rate of water, depth of the channel is 1feet and height of the channel is 3feet, rate of disposal of waste is uniform, lifter speed and motor speed is constant.

a. Lifter speed is constant and it regularly lifts the waste.

b. Cost of the machine will be economic and it requires only 12-24 volts of current.

CONCLUSIONS

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

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from industries will be treated through this project to meet the national emission standards, with stable operation, low cost and good effect. Drainage wastewater control should treated by this method to irrigate plants, clean toilets, etc. 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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