

Automatic drain and gutter cleaning system

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ABSTRACT

In the Solar System, the Earth is the only planet which has given life its existence. It is said that the creation of life is made up of only five elements which have been called “Panchtatva” including water, air, fire, earth and sky. In such a way, we can estimate that water is very important for our variables - the constant world. When we talk about the water that is on Earth, the surface of the earth is covered with about 71% water and the water present in the ocean is approximately 97% of the total water present on the earth. While the remaining 3% of the water is in the form of ice, in the rivers, in the lakes, in the soil and in all living organisms. The water supply of our planet is continuously from one place to another, from one form to another, through the water cycle.

The water of oceans is not potable due to being salted. Only 3% water is potable in which 2.4% water is present in the glaciers, northern and southern poles in the form of ice. Remaining 0.6% water is present in the rivers, ponds and lakes which can be. In such way controlling of wastes of water and water pollution must our primary purpose.

I.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 automatic 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.

II.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 deases.

III. LITERATURE SURVEY

Ganesh UL1 et all,

Got result as follow- 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. Alarm will turn on when the collecting bin is filled. b. Lifter speed is constant and it regularly lifts the waste. c. Cost of the machine is economic and it requires only 12-24 volts of current.[1]

Vikisahebrao bagul et all,

They worked on deplete squander water cleaner machine planned and made by utilizing gear changing and shaft coupling it comprises fundamentally dc equipped engine shaft squander expulsion plate receptacle course sprocket and chain construction material are effortlessly available create work development and mentainance siple to build [2]

Dr .K.KUMARESAN M.E, Ph.D, et all,

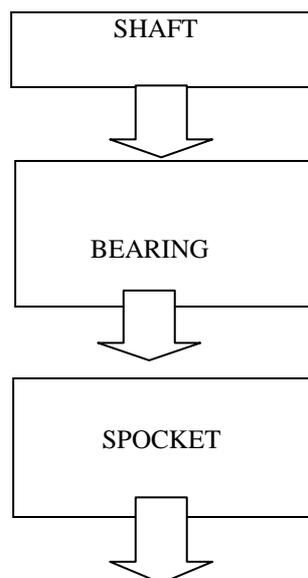
During the study of automation technology they realized that Automation is a technology concerned with his application of mechanical, electronic and computer based systems to operate and control production. This system is used TO OPERATE AUTOMATIC SEWAGE CLEANING [3]

Mragank Sharma ,

They worked on automatic gutter cleaner but constant type of gutter cleaner and can clean only polythene bottle which have ability to flow in water not the salt and soil present on gutter lowest level. [4]

IV.DESIGN OF MECHANICAL CLRANING SYSTEM

Flow chart for design calculation in Automatic drain and gutter cleaner to design of input



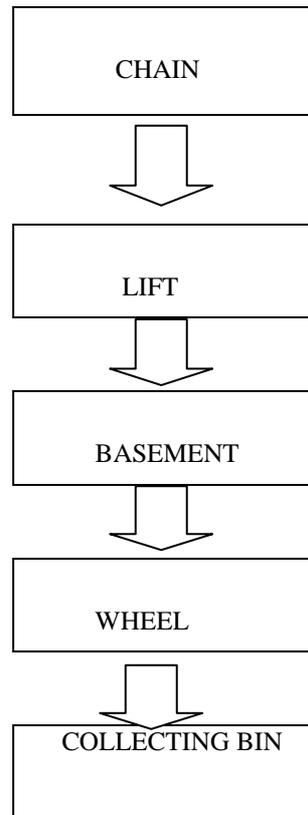


Fig.1 : Flow chart for systmr design calculation

V.SYSTEM DESIGN INPUTS

i. Shaft		
Outer Diameter=24mm	Material used=Mild steel. Length between shaft=1066.8mm	to Inner Diameter=21mm
ii. wheels	Qty-six	102 mm
iii. Chain Drives	Qty-two	Chain length = L=1524 mm
iv. Lifter		
Gap between each lifter=700mm	Length=610mm	Breadth =120mm

v.Collecting Bin	Length =610mm Height =305mm	Breadth =458mm Area of the collecting bin = L*B =279380mm

VI. FABRICATION OF MODEL

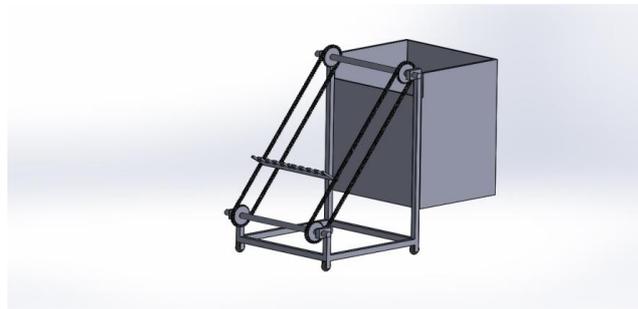


Fig.2. fabrication of model

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 moving to the bearings and also chain drive are also moving 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. Wheel shaft arrangement at the basement port of the drain machine another wheel arrangement are also added at near about middle point of the wheel which make the machine able to move during the cleaning prosses

VII.WORKING PRINCIPLE

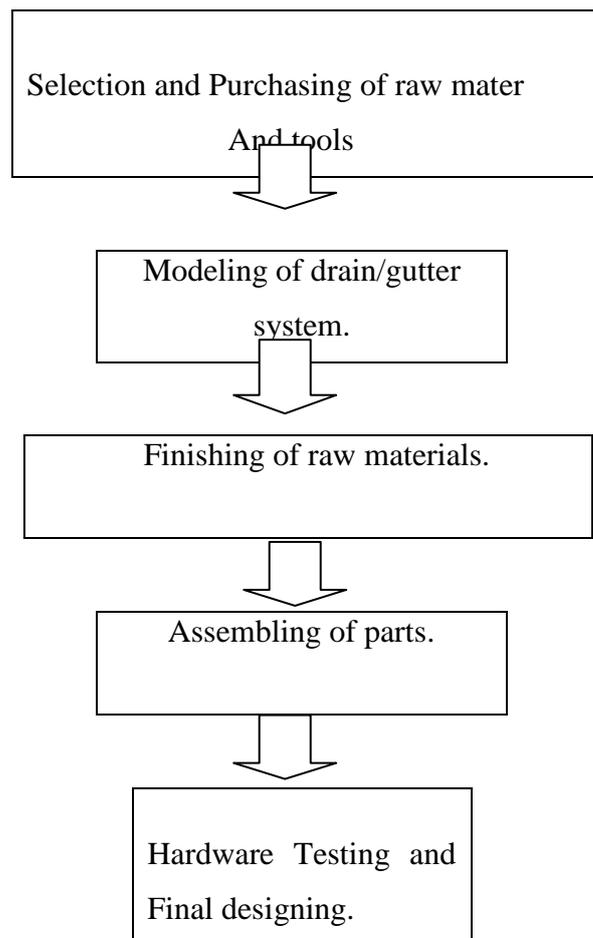


Fig.3 working principal automatic drain cleaner

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 uper shaft and wheel arrangemnet helped for mooving the machine during cleaning process. Means this gutter and drain cleaner clean and moove together fo better cleaning of gutter.

VIII.SYSTEM FLOW DIAGRAM

Methodology used for whole processing of Drainage cleaning Machine is given below this Methodology gives way about how work is to be carried out in systematic way.it is standard process of describing process, how it is done in simplest manner



IX.CONCLUSION

- In the treatment system of drainage Waste water control by the motor, roller chain and sprocket, lifter and the collecting bin and wheel to achieve 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 gutter, etc
- The cleaner functioned move effectively during the heavier rains which had more volume of running water with garbage and high velocity. and moove together fo better cleaning of gutter.
- The uper shaft and wheel arrangemnet helped for mooving the machine during cleaning process. Means this gutter and drain cleaner clean and moove together fo better cleaning of gutter.

X.ACKNOWLEDGEMENT

The authors wish to thank the management of BUDDHA INSTITUTE OF TECHONOLOGY and Head of the department for providing the facilities to carry out this work. I also would like to express my deep sense of gratitude to my UG students, department of Mechanical Engineering, for their support during this project work

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 (ICEIET 2016)
- [4.] International journal of engineering science and computing may 2017 volume 7 issue no 5