

Design and Fabrication of Automatic Channel Cleaner

¹Shivakumar R Ronad, ¹Suloka RL, ¹Samjaya Dm, ¹Sapparada Akasha, ²Robinson.P
¹UG Student & ² Assistant Professor
School of Mechanical Engineering, REVA University, Bengaluru.

Abstract— The design and development of a sustainable automatic channel cleaner which is self-sufficient of collecting solid floating waste from channels, river...etc. Idealization of this concept was to aid water flow in channels and thereby rivers. Inclined to the saying clean village results in clean city and cleaner city makes country clean, we have developed this machines which collects solid floating waste from flowing water and dumps it at an offset collecting bin. This machine is developed by bearing in mind the problems of urban flooding, cloggage and in these situation deploying humans is merely impractical and treacherous. Thoughtfully in case of low flow the machine is aided with a battery operated dc motor, the battery is powered by solar panel making the system sustainable.

Index Terms— floating, sustainable, flooding, cloggage, flow, waste

1 INTRODUCTION

Water is the basic need of all living beings on earth. About 71% of earth surface is covered by water of which only 2.5% to 3% adds to fresh water source, of these 68.7% is glaciers and ice caps, 30.1% is ground water and only 1.2% is surface water. With the advancement in science and technology we have been able to chemically purify water with an efficiency of about 98%. The ignorance of floating solid waste has led to urban problems like water clogging, flooding and many other environmental consequences.

Understanding the cause and effects of water pollution there is a need for developing an economical, portable and sustainable machine that would help in clearing the solid waste. Clogging and flooding is one of the urban problem faced these days. At places there is a need for frequent cleaned and cleared at frequent times in a week or perhaps in a day. Manual cleaning of water requires labours but the process if done manually would be very tedious and peril.

Hence keeping these consequences ahead us we have designed a portable and sustainable channel cleaning machine which uses green energy for operation. The ploy was challenging as the machine should collect solid floating waste from running water and dispose it at an offset collector bin.

2 LITERATURE REVIEW:

1. 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-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. [1]

2. 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.[2]

3. S D Rahul Bharadwaj, Proposed with the automatic cleaning of waste water in order to prevent global warming and melting of glaciers. The results emphasize the need of waste water treatment plants, through which the water is treated before suspending in rivers. Firstly power is generated and that power is used for waste water cleaning process. [3]

4. Balachandraetal, 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, treatment of disposal in different

- Shivakumar R Ronad School of Mechanical engineering, REVA University, INDIA, PH-9916328999. E-mail: shivouronad17@gmail.com
- Suloka RL, School of mechanical engineering, Reva University, INDIA, PH-8722204953. E-mail: sulokrl01@gmail.com
- Sanjaya DM, School of mechanical engineering, Reva University, INDIA, PH-815193393. E-mail: sanjayadm111@gmail.com
- Sapparada Akasha, School of mechanical engineering, Reva University, INDIA, PH-9986168243. E-mail: sapparadakash@gmail.com
- Prof: Robinson. P, Assistant professor at School of mechanical engineering, Reva University, INDIA, PH-782382900. E-mail: robinsonp@reva.edu.in

way toxic and nontoxic gases. PLC controller from Siemens was used in the treatment system of drainage wastewater control by the stepper motor, compressor, gas exhauster, pressure valve and the liquid level, flow and other analog variables to achieve automatic control of sewage waste water treatment. [4]

5. 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 "Automatic 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. [5]

6. 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 without any kind of affection of the bacteria. [6]

7. Nitin Sall, explained flow of used water from homes, business industries, and commercial activities is called waste water. 200 and 500 liters wastage water are generated each person every day. So using waste water technology that removes, rather than destroys, a pollutant in a drainage system. [7]

8. 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. [8]

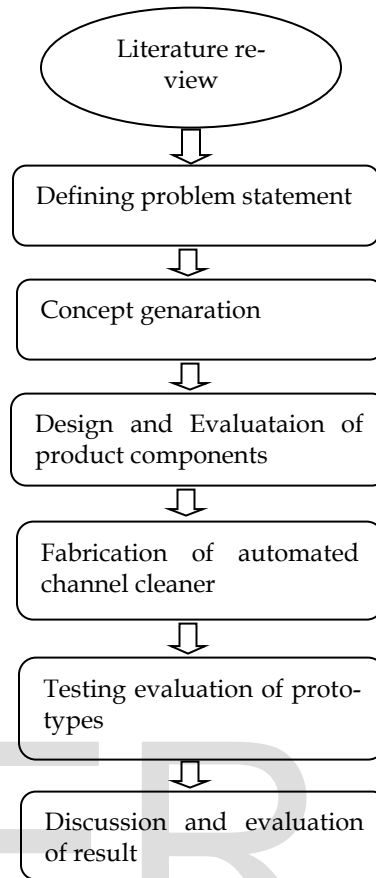
3 PROBLEM IDENTIFICATION:

- Though a number of machines have been successfully developed to clean up the stagnant water bodies like lake, pond hence there is a need for dynamic action plan for following water filtration
- A number of urban problems like urban flooding and blockage can be overcome
- There is a need for developing a machine which uses green energy
- Developing labour in these cases can be very dangerous and time consuming

4 SCOPE OF PROJECT

Automated channel cleaner machines mainly focuses on the problem of water block due to observation from solid wastes and the security of the labours involved in these plants. We are expecting to have this project employed at learnt at two point is a district, one at the entry point to the city and one at the exit for free flow of water is a mapped way. This is a prototype model which is designed for channels.

5 METHODOLOGY



6 CONCLUSION

This work introduces an elementary design and development of automated channel cleaner machine. This project carried out at university level has created an insight of social problem of water pollution management. The design of the proposed model includes impeller, dc motor, battery, conveyor belt, solar panel. The cost of implementation of this project costed about 15000/- which is about 1/4 of the cost for the available models in the market. The main advantages of the machine like portability, economic and sustainability has signed us the possibilities of its implementation at various levels starting from small channel to big rivers.

The future of this project is seen in end use optimization at concrete real time situations and as most of the parts can be mechanically produced at the industry level a midget electronic and electrical work can be carried out at execution site.

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