

“DESIGN & FABRICATION OF DRAIN CLEANING MACHINE”

Ms. Smita Gourkhede¹, Mr. Shnehal Panday²,

^{1,2} Faculty- NIT Engineering, Nagpur

E-mail:- ¹ Smitagourkhede38@gmail.com.

ABSTRACT

Rivers have major contribution in developing and preserving human cultures along their banks. Industrialization and urbanization have taken toll on the veins of human settlement. Day by day the rivers are continuously converting into drains. Every shining and growing city, metro has the other black side of heavily polluted water bodies. Many drains in district of Maharashtra state in India is also a victim of unplanned urbanization and development. Once the source of life are now waiting for life saving support.

Hence we are focusing to develop a system/ machine which can be run automatically. The cost of the system or mechanism will try to keep very minimum, so that the workers or contractors can purchase it or taken it on rent. This mechanism or machine can be equipped in a place where one or more than one drains meets.

The main objective of our project is to minimize the drain or garbage as much as possible to get a clean and safe environment and to utilize that was the future scope of this project is that they can be solar operated. We have pleasure in introducing our project Fabrication Of Drain Water Cleaning Mechanism. It is a genuine project which is fully equipped and designed for cleaning flowing drain Water for further purposes.

KEYWORDS

Cleaning the Waste, contaminated, Drain Cleaning Mechanism

INTRODUCTION

Polluted drain water is a major global problem which requires ongoing evaluation and revision of water resource policy at all levels. It has been suggested that polluted water is the leading worldwide cause of deaths and diseases, and that it accounts for the deaths of more than 14,000 people daily. An estimated 580 people in India die of water pollution related illness every day. Around 90% the water in the cities of China is pollute, and as of 2007, half a billion Chinese had no access to safe drinking water. In addition to the acute problems of water pollution in developing countries, developed countries also continue to struggle with polluted water problems. The head of China's national development agency said in 2007 that one quarter the length of China's seven main rivers were so poisoned the water harmed the skin due to the contamination of drains and other wastes.

Water is typically referred to as polluted when it is impaired by anthropogenic contaminants and either does not support a human use, such as drinking water, or undergoes a marked shift in its ability to support its constituent biotic communities, such as fish. Natural phenomena such as volcanoes, algae blooms, storms, and earthquakes also cause major changes in water quality and the ecological status of water along with the industrial wastes and drains which causes the river to get polluted.

Due to day to day regular increase of the problems regarding the purity of water and cleanliness of society, this project is very beneficial as in terms of reducing the garbage and flow of water through drains which ultimately results in cleanliness of the society or locality. In this concept we have concentrated both on water as well as cleanliness of the locality. Our project that is “DESIGN AND FABRICATION OF DRAIN CLEANING MACHINE” aims the places where there is scarcity of water for sanitation and other purposes, which has been dry or contaminated due to the amount of garbage dumped into it. This machine deals with those garbage which prevents the flow of regular water and throw them out so that water might be used for some purposes instead of producing bacteria and algae. This machine does not harm anyone but it aims to provide service to the society in its own way.

PROBLEM IDENTIFICATON

The aim of this project is to reduce the garbage because day by day the environment is getting affected, which will result in harmful and hazardous effects on human beings. Thus the objective of this project is to prevent the harmful effects on nature within the reasonable cost, so that at least some percentage of effect can be minimized through cleaning drains in nearby areas or where the locality is located so that humans and animals may not face problems related to health. The data related to this concept is obtained or collected from the previous surveys and sites available from the internet. Due to more and rapid increase of wastes, dumped in the drains affects the flowing water and thus to utilize that choked water or polluted water, this system/machine is very useful.

So, In Our ‘Drain Cleaning Mechanism’ concept, we have targeted to make mentioned project concept to clean the water in the drain and utilize it for any other purposes and to make the drain water, free from garbage which meets in the river and does not affects the aquatic life.

Not only this even we drove our attention towards the budget so that the total cost of our overall project can be minimized by utilization of the raw material available in the department.

CONSTRUCTION

The construction of drain cleaning mechanism is very simple, the equipments required for the machine are less. It mainly consists of electric motor, bearing, belt and pulley's, and other small materials like angular bar, etc. Using this equipments the garbage is cleared from the drains which somewhat cleans the water. The main purpose of the machine is to clean the garbage from choked drains and increase the flow of drain water from flowing through them.

In our Drain cleaning mechanism two electric motors are used, One electric motor which is used to rotate the pulley with the help of belt. The another motor is used for uplifting the garbage from drain through a plate. An electric motor is an electrical machine that converts electrical energy into mechanical energy. The reverse of this would be the conversion of mechanical energy into electrical energy and is done by an electric generator. The electric motor produces a1440 rpm. The voltage required for the electric motor is 230 volts and frequency is 50 Hz.

There are two pulley are used. The sizes of the pulleys are different. The larger diameter pulley is connected to electric motor shaft and small diameter of pulley is connected to lead screw. The two pulleys are transmitting power by using trapezoidal (V-shaped) belt. The arrangement of the belts and pulley is such that it will produce rotary motion to the lead screw and actuates the plate which is attached to it.

The lead screw is the main part of this system because the actuation of the upper plate is done through it only. With the help of belt and pulley the lead screw is rotated and this rotation allows the upper plate attached to it moves from one point to other thus it removes the garbage from the uplifted plate and dump it.

WORKING

When the Sewage Polluted water flow towards the lifting net it gets blocked into the net and the plate 1 which is attached to the rod lifts the garbage with it and moves upwards with the help of manually operated lever mechanism. As the garbage moves upwards it will stop at certain point and the another plate which will operate through the lead screw which will run with the help of another motor. This plate 2 will move the garbage from plate 1 and the garbage will be out from the water.

Initially, when the garbage moves towards the net, it will block in first net which will operate manually, and resist the garbage to flow /pass through the main net. As the plate 1 of the main net is upward, and the garbage is restricted in the movable plate. After the garbage is dumped from the plate, the dumping plate will back to its position by changing its motion through an electric lever and with the help of lead screw same process continuous, thus the water will get garbage free and will get used for other purpose.

DEVELOPMENT OF OUR CONCEPT

“Design & Fabrication of A Machine to Reduce the Critical sediments & waste practical & related Parameters along with Improve quality of water”

NAMES OF COMPONENT

The components used in this machine are:

1. Electric motor
2. Bearing
3. Belt and Pulley
4. Lead Screw
5. Metal Sheet
6. MS rod

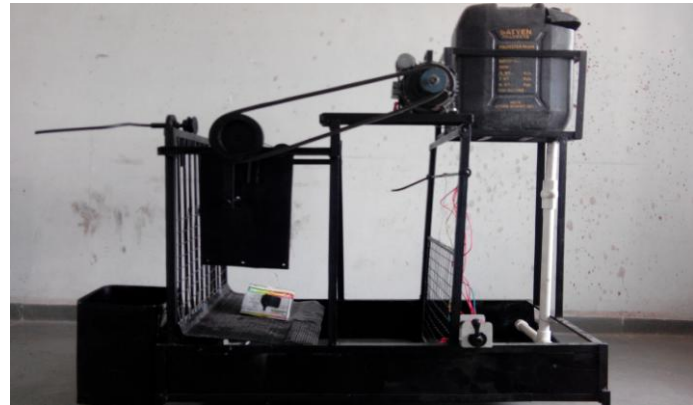


FIGURE: CONCEPTUAL PROTOTYPE MODEL

COMPONENTS DETAILS

Sr. No	Part Name	Specification
1	Single phase Motor	1400 rpm, 1Hp, 230V
2	Lead screw	Length = 80cm Pitch = 0.4cm External Dia. = 3.5cm
3	Water Drain Tank	Length = 120cm Breath = 70cm Height = 10cm

4	PVC Pipe	Diameter = 1inch Length = 5 fit
5	Ms Rod (Round Bar)	Diameter = 0.8cm Length = 80cm
6	Net	Length = 70cm Height = 80cm Distance between to rod = 6cm
7	Water Tank	Litter = 12L

APPLICATION OF MECHANISM

- It can be used for cleaning drains.
- It can be used for cleaning small River.
- It can be used for cleaning guider

FUTURE SCOPE

- In future remove lot of garbage from the drain.
- Advance model of this machine.
- By using sensor in machine to remove the garbage.

- Automation will be done in this system.
- This can also be solar operated by using various equipments of renewable energy sources.

CONCLUSION

This paper highlights the part of mechanism and the expected outcome after its restoration based on successful models tried in different cities of India. Nag River is a polluted river with mere sewage flowing through it. Implementation of the methodologies and model suggested can improve the condition of the drain to a great extent. Models and cases discussed in this paper are successful rejuvenation projects and the outlook of rejuvenation of NAG River is excellent.

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ADVANTAGES OF THE MECHANISM

- It reduces human efforts.
It consists of motor in which the plate is move in forward & reverse direction and it is done by automatically, so it reduces human efforts.
- It removes the pollutants & scarp from the drain.
The aim of this project is to remove the garbage from drain, so it can remove the harm full pollutants & scarp from the drain.
- Process is simple.
In this project one motor is used so the process is simple because the main mechanism is done automatically.
- It is used to clean water so that it can be used for other purpose.
In this project the garbage is remove from drain water and this water is totally waste by this project we can use this water for other purposes.

DISADVANTAGES OF THE MECHANISM

- Due to processing of this system the minute quantity of garbage is reduced.
By this system the minute quantity of garbage is reduced because the quantity of garbage is more and we cannot remove move garbage at one time.
- The system required semi-skilled operator.
Due motor the system required semi-skilled operator foe giving forward or reversed direction.
- It is heavy in construction