

# Design and Fabrication of Drainage Cleaning System in Manhole Regions

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**Abstract:** *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. The chief function of the automatic drainage system is to collect, transport, as well as dispose the solid waste in the waste bucket by the help of claws.. Solid waste in drainage water includes empty bottles, polythene bags, papers etc. Impurities in drainage water can lead to blockage of the drainage system. In order to avoid such situation these impurities are needed to be taken out time to time for the continuous flow of drainage water. Drain can be cleaned continuously by the help of model using the drive system to remove the solid waste and threw it into waste bucket. This project is designed with the objective to initiate the efficient working of system. This project automatically cleans the water in the drainage system each time any impurity appears, and claws which are driven by chain sprocket grasp the solid waste and threw it into the waste bucket to avoid blockage. It even reduces the cost of manual labor as well as reduces the threat to human life.*

**Keywords:** Manhole region

## I. INTRODUCTION

Automatic Drainage Water Cleaning overcomes all sorts of drainage problems and promotes blockage free drains promoting continuous flow of drain water. In the modern era there have been adequate sewage problems where sewage water needs to be segregated to clean our surrounding environment.

The liquid and solid waste and gases produced from the industries are very harmful to human beings and to the environment. Our proposed system is used to clean and control the drainage level using auto mechanism technique.

## II. PROBLEM STATEMENT

In today's era automation plays a very important role in all industrial applications for the proper disposal of sewage from industries and household is still a challenging task.

Drain pipes are used for the adequate disposal of waste and unfortunately sometimes there may be a threat to human life during the cleaning of blockage in the drain pipes or it can cause serious health issues because of the pertaining problems like malaria, dengue, etc. In order to overcome this problem as well as to save human life we implement a design

**“Automatic Drainage Cleaning System”.**

We designed our project in order to use it in an efficient way to control the disposal of waste along with regular filtration of drains, removal of solid waste in order to avoid blockage in drains to promote continuous flow of drainage water which ultimately reduces the threat to human life.

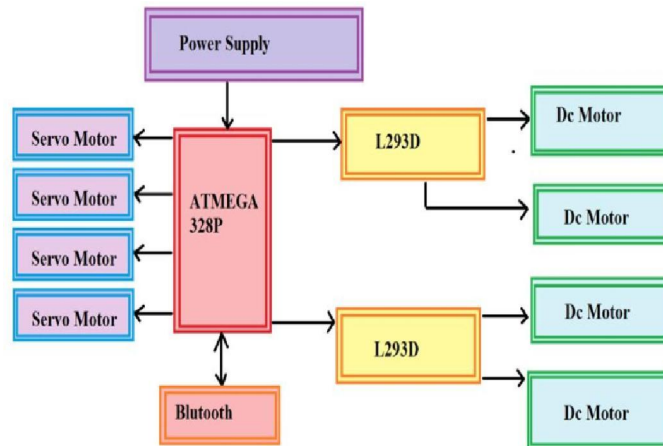
**III. MATERIAL USED**

S No.	Description	Size/Qty	Cost
1	PVC Pipe	-	500
2	Bluetooth Module	One	1000
3	12V DC Motor 10RPM	One	400
4	Wheels	Four	200
5	12V 7.2 Ah Battery	One	300

**IV. WORKING PRINCIPLE**



Figure.1. Base Diagram of Automatic Drainage CleaningSystem



**Figure.2. Block Diagram**

The system will work as a robot. It will locate the debris using USB camera. It has a robotic arm with adjustable length , the arm will collect debris from the manhole, pull it out and put it in a container outside the drainage line.

User can do different operations like movement of arm, camera angle adjustments, pick-up and drop of the debris using the keyboard.

The system has Atmega328P microcontroller, L293D motor driver,couple of DC motors , Servo motors and a Keypad to operate the robotic arm and wheels.

For simulation we have used the Proteus simulation software.

As per shown in the block diagram, we have used the components that will be easily available in the market for the situation if any component got damaged, it can easily replaced by another



Figure.3. Camera for Under Construction Working

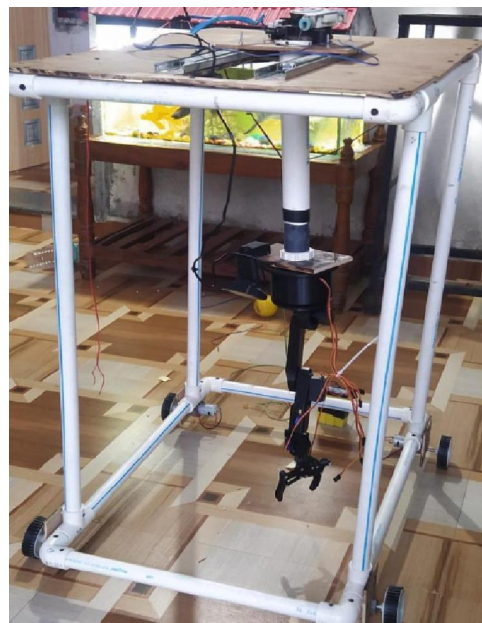


Figure.4. Complete Working Model

## V. ADVANTAGES AND DISADVANTAGES

### 5.1 Advantages:

- Cost of production is low
- No need to purchase heavy machinery

- Reduces threat to human life
- Manual assistance is not required
- Working principle is quiet easy.
- Compact
- Portable.
- Highly Efficient

### 5.2 Disadvantage

- Continuous power required to operate.
- Container need to be clean time to time.
- Rusting risks of System

## VI. APPLICATION

- It can be installed for domestic sewage treatment.
- It can be used for proper treatment of sewage as well as to avoid blockage of drains.
- It is portable and compact in size which initiates easy handling.
- Manual assistance is not required.

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