DRAINAGE CLEANING ROBOT

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Abstract: The recent development in robotics has enabled robot technology to solve many practical problems that humans encounter in day-to-day activities. But, even today manual scavenging of the drainage is practiced in all places of India, wherein men enters the manholes and clean the waste materials in the drainage manually with no technical equipment. It is a dreadful process where the drainage wastes are cleaned by the people that may include the basic tools like buckets, brooms for disposing the drainage wastes.

This practice might jeopardize the lives of humans; therefore, a drainage cleaning robot is essential to replace the human intervention. The overflow of drainage water leads to several hazards to the environment. The method used now days contains pumps to suck the drainage water but it fails to clean the rock solids inside the drainage hole. In order to overcome this issue, an attempt has been made to design and develop a ARM robot, which can be controlled by the PWD workers and efficiently cleaning and disposing the drainage wastages there by controlling the overflow of drainage water by transmitting messages from drainage using transmitter encloses RF transmitter and diode logic to the receiver which has PIC Microcontrollers and RF receiver placed on the street poles.

Keywords: Drainage cleaner, floating waste

1. INTRODUCTION

Robots are been in use for making the human life easier and comfortable. It plays a vital role in all sorts of applications like agriculture, industries, security and environment. There are so many hazards occasions in day to day life for human life where the human can't work. In that situations without a significant amount of safety precautions like, the disposal of wastes that are hazardous, radioactive substances, distant handling of volatile devices and righting and hostage situations among others the pick and place robots, often called arm robot can be used. Robots can work safely at these dangerous conditions. These robots guarantee the human safety and replace enormous human work force [4].

It can be also applied in surgeries, defense purposes and medical science with artificial intelligence, manufacturing field and super market field. These are compact and efficient robotic systems. There is a need for the development in cleaning the drainage wastes by using robots. Since drainage cleaning involves manual scavenging which leads to several health hazards to the person entering the manholes of the drainage. Often the drainage water overflows which makes unhealthy environmental conditions that provides platform to become a breeding place for mosquitoes. According to the study takes place at 2014, nearly 1300 manual scavengers ‘dies due to the health disorders. The reason behind this is that the drainage consists of more toxic gases like methane that leads to higher mortality rate of the manual scavengers. Also, the improper disposal of drainage wastes causes degrade of our surroundings.

2. LITERATURE REVIEW

Flow of used water from homes, business, industry and commercial activities are called waste water. 200 and 500 litter wastage water are generated each person every day. So using waste water technology that removes, a pollutant in a drainage system [1].

Proposed safe load for the chain and ability of the same to withstand the use of finite element modeling would be the core objective of the work. An existing chain link used for benchmarking the research work. The FEM method is used analyze the stress state of the elastic body with a given geometry, such as chain link [2].

Today the advanced time has such a variety of advanced for make our life modern. Like that cleaning procedure is a likewise play a critical part. For example, our smart cleaning system do the residential reason cleaning flawlessly and keep the mosquito era from the sewage by the way intestinal sickness, influenza and so forth illnesses are stay away from the future to robotization cleaning frame work will be lies on each different house sewage cleaning frame work[3].

3. PROPOSED SYSTEM

The rectangular Robot chassis is made with four wheels. To drive these wheels four DC motors are used. The robot wheel movement is controlled by the remote. The whole assembly is placed on robot chassis. Here we are using two mechanisms one is robotic arm & another is DC pump.

Robotic arm is used to collect the solid waste and Dc pump is used to suck the muddy liquid waste. The solid waste is then collected in storage tank by the two procedures. First procedure is for picking the solid waste up, the ARM moves vertically and then rotates
horizontally and which place the solid waste in the storage tank. Second procedure is to suck the liquid waste by the DC pump. DC pump has two pipes one for inlet and another for outlet. Inlet pipe suck the muddy liquid waste and passes through the outlet pipe.

Complete block diagram

The system is consist of Power supply unit, PIC microcontroller, Servo motors, DC motors, DC pump, LCD display, Robotic arm, Regulator IC. PSU includes battery and regulator ICs. The controller we decided to use is PIC microcontroller. 16×2 LCD display is used to display robot arm movements. The servo motors are for arm handling and DC pump is used to suck the liquid waste from the manhole. Four DC motors are used to control the robot movements.

Initially controller gets the command from RF transmitter (remote). RF transmitter is connected to the remote. By pressing the key of the remote this will send the commands to the RF receiver which is interfaced with microcontroller. Then microcontroller acts accordingly with the commands it controls the DC motor movements.

Servo motors are used to drive the robot arm and also for the DC pump. Robotic arm is used to collect the solid waste and DC pump is used to suck the muddy liquid waste.

4. ADVANTAGE
   - Reduce in environmental degradation.
   - Human life is saved and the proper disposal of drainage wastes.
   - Reduction of labour oriented method of cleaning, thus upgrading dignity of labour.
   - Easy to operate and it is portable.
   - Large amount of garbage will collect which can be re-manufacturable.

5. DISADVANTAGE
   - Cost affective.
   - This method requires trained technician’s to operate the robotic arm.

6. FUTURE SCOPE

   This system can be adopted by using hydraulic pressure. The system can be improved by using the GSM module with water level indicator which monitor water flow of drainage and transmit the message to the PWD worker through the GSM module.

   Also we can use the camera which interfaced with monitor that enables to monitor the current status of drainage.

7. RESULT

   The main objective of the project is to collect the solid waste from the drainage. Input is given through the remote to the RF Receiver. After receiving the commands to the RF Receiver, the motor starts rotating. That will be movement of wheels takes place. Robotic arm is used to collect the solid waste and DC pump is used to suck the muddy liquid waste. Finally the drainage is cleaned by using Robotic Arm.

8. CONCLUSION

   By implementing this concept of intelligence drainage cleaning method there will be reduce in the manual scavengers in our country which reduces the health hazards for humans thereby reducing the environmental pollution in our country. Though the initial setup may cost high it gives healthy environment for us and for our future generation. This system collects solid waste as well as muddy
liquid waste by the DC suction pump. This can reduce the direct contact of human labour with the waste water so there is no hazard for the human labour. Also this method is semiautomatic so the working time is less as compared to conventional method.

REFERENCES

