Microcontroller Based Sewage Cleaner

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Abstract - In recent years there is a rapid increase in sewer man death counts which should be considered as a biggest social issue after Kashmir War. This issue demanded to develop a Machine or a Robot that cleans the sewage and drainage tank automatically and without human intervention. In this proposed system the IR Sensors will sense the blockage in sewer lines. And the stepper motor will move in the corresponding direction of blocked sewer line. A Motor pump that connected to the stepper motor will be enabled through a relay .This pump will apply the water force and thus the block will get cleared. Due to the gases present in the drainage tank (Especially CO), the sewer workers are get struggled to take oxygen, at the extreme point it causes death. At low capital and maintenance cost this project helps to clean the Drainage Tank Manholes and can reduce the Death Cases in upcoming years

I. INTRODUCTION

At present, there are two different challenging tasks that are found in the Sewage Cleaning Process. One is clearing the blockage in pipelines connected between Manhole and Drainage Tank. And the other one is sucking the floating objects and sewages inside the manhole. We have several existing methods to overcome Task 2. But for Task 1 still there is no clear solution. This new model gives a solution in a simple manner.

II. PROBLEM IDENTIFICATION

In today`s era automation plays a very important role in real time applications. But cleaning processes in sewage tank manholes is still a challenging task in India which destroys 1000's of Human life/a certain community per a decade.

For better understanding refer the **Chart1** which compares the mean of deaths in Kashmir war and mean deaths of Sewer Man in India in recent year.

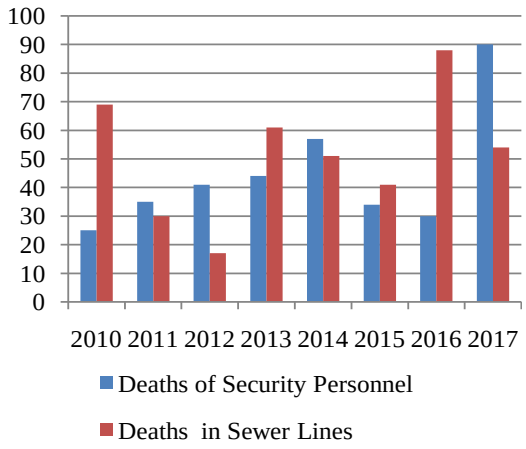


Figure 1: Problem Identification

III. OPERATION

- As mentioned earlier, the main issue is that the cleaning process of sewer lines. The IR Transmitter and receiver are placed in the end to end of sewer lines.
- In any situation that causes blockage in sewer line can be sensed by interfacing IR with Microcontroller (ARDUINO). The microcontroller provides the direction to the

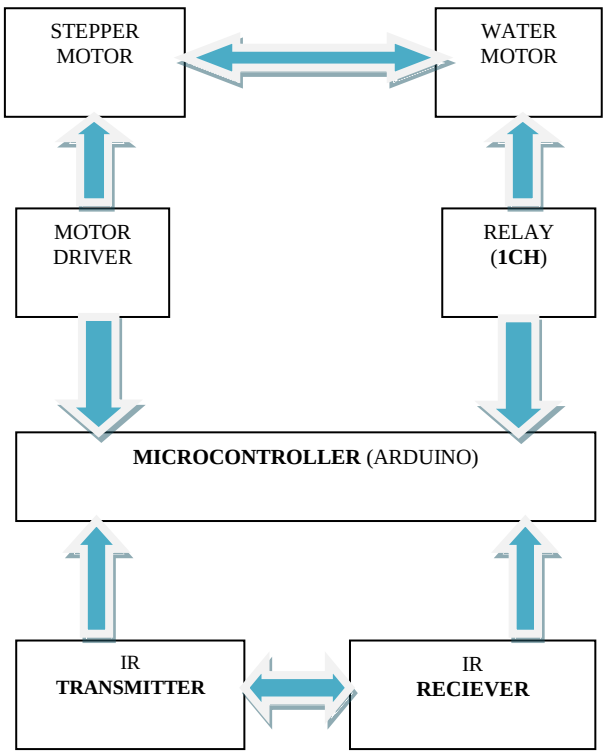
motor corresponding to the IR signals. Hence the motor pump which is connected to the stepper motor will also move in the same direction.

- The **1CH** relay enables the motor pump according to the program defined. So the force of the water that is generated by the motor pump will clear the blockage present in the sewer line.

IV. MATERIAL DESCRIPTION

S.NO	Description	Range
1.	PVC Pipe	3'', 35mm
2.	ARDUINO	UNO
3.	Battery	12V DC
4.	Stepper Motor	12V/0.5 A
5.	Motor Drive	STA 401A
6.	Motor Pump	12V/0.5A
7.	IR ,CO Sensor	2 no's,1 no
8.	Relay	1CH

V. BLOCK DIAGRAM



VI. APPLICATION

1. Drainage manholes in Apartments, Institutions
2. Sewage tank manholes in Roads

VII. ADVANTAGES

1. Low capital and Maintenance cost
2. Eco- Friendly and Cleanliness
3. Compact size
4. Very simple operation
5. **1000's of Human life will be saved per a decade**

VIII. FUTURE IMPLEMENTATION

1. Electronics Replacement

In this proposed system IR Sensors are used to sense the obstacle presence in sewer lines which is not suitable for all time application. So that there will be some replacements for IR Sensor into Giant level sensors like Laser Sensors, Fiber Optical Sensors and so on.

2. Smart System Optimizer: As mentioned earlier automation plays a vital role in today's environment, data optimization is an essential thing for any innovation. For this system, Transmission of sensor signals, Rotational Parameters of Stepper motor such as Step angle, Force supplied by the Motor pump are all the data to be monitored.

IX. REFERENCES

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2. www.youtube.com
3. Theory of Machines – S. S. RATAN