

PIPELINE INSPECTION AND CHILD RESCUE ROBOT

Bore Well Rescue Robot

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Abstract—The aim of the project is to give a new concept to handle the bore well rescue operations. Now-a-days child often falls down in a borehole which is left uncovered and left trapped. It is difficult and risky to rescue the trapped child. To avoid this, we proposed a system of designing a robot. This robot is capable of moving inside the pipe according to user commands given from wireless communication. The robot structure consists of power supply, gear motors, camera and microcontroller. The condition of trapped child is captured with CCTV camera and monitored on a TV. This robot provides a supporting platform to lift up the child. This borehole robot consists of three wheels with rubber grip for which motors are connected. So that the wheels will exactly fit to the walls if the hole which make the robot to move inside down without any sliding. This robot uses an arm to pick up the child from the borehole.

Index Terms—Robot, child rescue, Microcontroller, Wireless communication, Bore well.

I. INTRODUCTION

In order to meet the increasing demand for water bore wells are dug. But these are usually left uncovered and children often fall down. Normal rescue operation strategy involves digging a parallel pit to achieve and adjacent holes are made to walls of bore wells. But these are time consuming and may cost life. By using a robotic structure it is possible to rescue a child within a short time.

II. OVERVIEW

A robot for bore well rescue offers solution to this problem. It is fast, economical and safe. It has the facility to monitor trapped child, provide a supporting platform to lift up the child. The system will attach a harness to child using robotic arms for picking up the child. The robotic arm has motor attached to it for picking and placing.

This proposed system will easily rescue the child within a very short time without any major injury. Visualizing the child is made possible with cameras and a high resolution TV monitor. This is a light weight machine that will go down the pipe and save the child's life systematically by performing the required action.

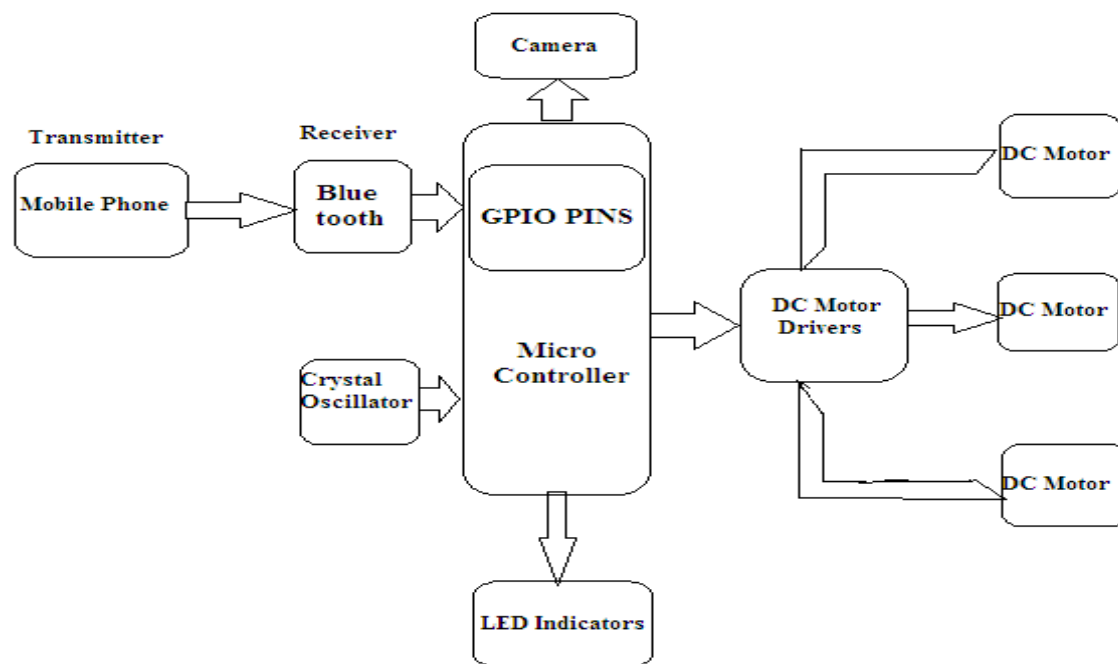
III. EXISTING SYSTEM

The main objective of this project is to make it possible for a child fall inside bore well to rescue without any injury. This goal is achieved by controlling a robot to take off the child inside the bore well, which is controlled by the person from outside. In existing system, a big hole is dug beside the bore well up to the depth where the child is stuck. A small delay in this resources accumulation may reduce the chances of saving child alive. If the area beside the bore hole contains rocks below certain depth, in such cases the chance of saving child alive is very low. Lack of oxygen inside the bore well and lack of light sources causes the major difficulty during the rescue operation. There is no such special equipment for rescuing the child trapped inside the bore well. There is no proper technique to rescue victims of such accidents. When the local arrangements do not work, army is called in. In most cases reported so far, a parallel hole is dug up and then a horizontal path is made to reach to the subject's body. It is not only a time taking process, but also risky in many ways. Moreover it involves a lot of energy and expensive resources which are not easily available everywhere and in this process, we always need big space around trapped bore that we can dig. Whatever may be the case the success ratio depends on lots of factors like availability of time taken for transportation of machinery, human resources and mainly the response time of various government organizations. In India according to the NRCB report of 2011 there are 5 average deaths per day in the license bore wells. At present there is no proper solution for this problem; in this paper the model of a robot arm which can be used for rescue operation is explained.

IV. PROPOSED SYSTEM

This work is aimed towards the construction and designing of a robotic system to work in bore hole rescue operations and to detect faults inside the pipeline. The robot has arms to pick and place the objects.

V. BLOCK DIAGRAM



ATmega8 Microcontroller—

ATmega8 microcontroller is a low-power CMOS 8-bit microcontroller based on the AVR RISC architecture. By executing powerful instructions in a single clock cycle, the ATmega8 achieves throughputs approaching 1 MIPS per MHz, allowing the system designed to optimize power consumption versus processing speed. ATmega8 microcontroller has 23 programmable input/output pins which can be used for interfacing with external world. This IC comes in 3 different packages, but we are using the popular 28 pin PDIP package.

Camera—

Closed circuit television, also known as video surveillance, is the use of video cameras to transmit a signal to a specific place, on a limited set of monitors.

Bluetooth—

Bluetooth works as a receiver and accepts the signals transmitted from the mobile phone. The Bluetooth here we are using is HC-05.

Software Used—

- **IDE AVR-v4:** Compiler for embedded C programming.
- **Prog ISP-7:** Used for dumping code into microcontroller.
- **Proteus-7:** Used for hardware simulation/ circuit designing.

VI. FUTURE SCOPE

Our project “Pipeline inspection and child rescue robot” is mainly intended to operate the robot in to a bore hole through PC using Bluetooth. This project can be extended adding bomb diffusion, GPS to set location and digital compass to self navigation.

VII. CONCLUSION

This project is used to reduce human efforts for rescue operations from bore well. It performs rescuing operations in very less time as compared to humans. This robot can even perform pipeline inspection which is beyond human reach.

VIII. ACKNOWLEDGMENT

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