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SMART BORE WELL CHILD RESCUE SYSTEM

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Abstract

Today's major problem faced by human society is water scarcity, which leads to a large number of bore wells being sunk. These bore wells in turn have started to take many innocent lives. Bores which yielded water and subsequently got depleted are left uncovered. A suitably strong cap of bright color to cover the mouth of the bore will avoid such accidents. To aid in such rescue we have proposed a system. The equipment is designed to operate off the 12volt battery of the rescue vehicle. The remotely controlled robot will go down the bore well and perform the action. The objective of the project is to construct and design a bore well rescue robot with the balloon to lift the child. The robot is operated through PC using wireless ZIGBEE[1] technology and using wireless camera.

Keywords: *ROBOT, wheels, zigbee, PIC16F877A microcontroller, wireless camera, balloon.*

1. INTRODUCTION:

There is no proper technique to rescue victims of such bore well accidents. The existing technique[4] which involves digging the parallel hole to rescue the child next to the bore well in which the child has trapped actually. 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 the trapped bore that we can dig a parallel bore. These ad-hoc approaches involve heavy risks, including the possibility of injuries to the body of the subject during the rescue operation. Also, the body may trap further in the debris and the crisis deepens even more means death. In most cases, we rely on some make shift arrangements. This does not assure us of any long term solution. In such methods some kind of hooks are employed to hold the sufferers clothes and body. This may cause wounds on the body of the subject. The successive technique involves manual work. It is not only a time taking process, but also risky in various ways. The advent of new high-speed technology and the growing computer Capacity provided realistic opportunity for new robot controls. Recently many accidents occurred in India. Forty five deaths of children have been reported in the country since September 2009[2], from that we have only nineteen with the proof of a newspaper(refer table no 2.1) After studying all the cases, we found a solution to do, which results a robotic machine which can go through the trapped bore well without any support

2. INCIDENTS OCCURRED IN AND AROUND THE COUNTRY

Fig -1: Child rescuing from bore well by digging the parallel hole

3.RESCUE OPERATION:

The entire system is controlled by PC. It includes two sections, they are

3.1 Receiver section (fig 3.1)
3.2 Transmitter section (fig 3.2)

3.1 RECEIVER SECTION:

The entire system is developed using PIC 16F877A microcontroller which comes by PIC 8-bit family[6].

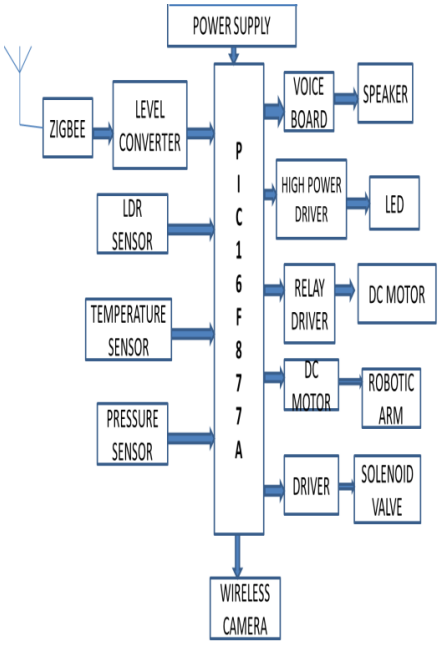

Fig -2: Receiver block

Table -1: accidents due to bore well

PLACES	YEAR	AGE
Jodhpur	July, 2016	18 months
Alwar	Oct,2016	6 year
Hyderabad	Feb, 2016	3 year
Karnataka	Aug, 2014	6 year
Bhavnagar	May,2014	3 year
Vellore	April,2015	3 year
Tiruvannamalai	April,2014	18 months

3.1.1 WORKING:

Our project consists of five motors. Four motors for movement of wheels and one for compression and relaxation of robotic arm. Relays are used where it is necessary to control a circuit by a low-power signal (with complete electrical isolation between control and controlled circuits), or where several circuits must be controlled by one signal and it is used to drive the motors. The environment inside the child is sensed by using sensors[7]. LDR sensor is used for providing the light inside the dig which senses the light intensity and glows the light using high power LED driver. LM35, Temperature sensor is used to detect the temperature inside the bore well. This project uses ZIGBEE technology embedded systems and a mechanical unit for the rescue. Special graspers are used to lift the child from the pits or bore-well. Microcontroller controls two dc motors. Microcontroller controls LED. Wireless camera records child status and these records are sent back to controller unit through ZIGBEE Transceiver. The whole system will be tested by using a child model (toy) in a dry bore well.

3.2. TRANSMITTER SECTION:

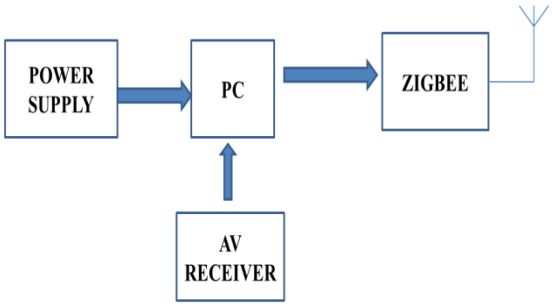

Fig -3: Transmitter block

3.2.1 WORKING:

The control will be transmitted by the pc through ZIGBEE. The ZIGBEE is interfaced with PC using level converter (RS232). The instructions are provided by the pc to the robot such as moving forward and reverse direction and controlling the arm, balloon[3] to lift the child.

4. SOFTWARE TOOLS:

- **MPLAB IDE-** for program(Embedded C)
- **HI-TECH**-compiler
- **PROTEUS-**simulation
- **HYPER TERMINAL-**control overall process

5. METHODOLOGY:

The first step is to allow the robot inside the bore well and then visualize the victim inside the bore well using wireless camera. The robot consists of 6 wheels and one upper wheel which give support to the robot to move along the wall. The wireless camera transmits the victim's situation to PC through ZIGBEE transceiver. The temperature sensor attached to the robot will send the temperature range inside the bore well to PC. The pressure sensor will detect the pressure and send it to the PC. By analyzing the position of the victim, the robot arm is controlled and monitored through PC. The robot arm will give the support to the victim. The robot movement and visualizing is controlled by Hyper Terminal software. After collecting all data, the balloon is moved further below the child and expanded using air-compressor. The balloon[3] which forms the basis to the child. The baby movements see through the lower camera and other data readings see through PC. Camera[8] is also capable of getting audio sound from inside the bore well. It is connected with Aux cables and wires are used to connect the Camera with display and power supply for working of camera. A output display is also used to see the actual on time location of the child every time. It is a must requirement item in rescue of child trapped inside the bore well. Then slowly, the baby is moved upward by balloon. The medical team will be able to prepare for the treatment depending on the already seen temperature of the baby. Finally the victim is recovered from the bore well.

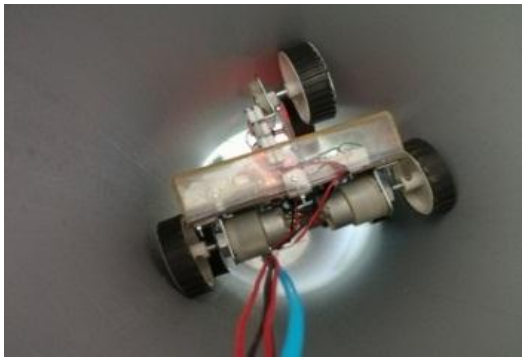

Fig -4: Robot moving vertically inside the bore well

6. ACKNOWLEDGEMENT:

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7. CONCLUSION:

Human life is precious. Our smart bore well child recue system is a significant attempt to save the life of the victim of bore well accidents. Besides this, the unique capability of climbing through vertical and inclined pipes makes wide scope of application for this machine in manufacturing industries and other relevant fields. In the current design of bore well child saver machine is has been made to suit every possible situation may occur in rescuing operation. We like to conclude with the help our project, we able to rescue without any damage.

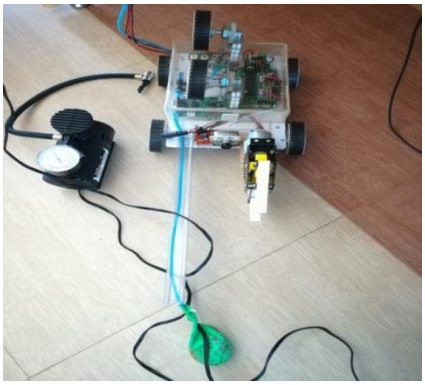

Fig -5:Rescuing robot

8. FUTURE SCOPE

In future we can use this project in several applications by adding additional components to this project. The structure is made strong enough to sustain all possible loads, though it can be flexible at the same time to adjust wider range of bore diameter and any change in the diameter of bore. we can send these robots to dangerous zones by connecting smoke sensor to the robot we can get the information related concentration of smoke or gases in respective fields and sensor will detect the poisonous gas and it gives information to the Microcontroller and microcontroller gives the information to the transceiver from that we can get the data on the PC side.

9.REFERENCES:

[1] Chen, H., Chang,L., Design and Implementation of a ZigBee-Based Wireless Automatic Meter Reading System Przegląd Elektrotechniczny (Electrical Review)

[2] Pipeline inspection and borewell rescue robot "Palwinder kaur, Ravinder kaur, Gurpreet singh". IEEE, VOL3.

[3] Safety balloon-Direct web search on google.com

[4] Manish Raj, P.Chakraborty and G.C.Nandi "Rescue robotics in bore well Environment" Cornell university library [v1].

[5] www.wikipedia.com

[6] www.microchip.com

[7] www.allaboutcircuits.com

[8] www.howstuffworks.com