PIPELINE INSPECTION AND BOREWELL RESCUER

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Abstract: As we are engineers we a have more respect towards society thus we have found a solution in solving a major problem that broke hearts of many parents who lost their child to abandoned borewell. The main objective of our Project Pipeline inspection and bore well rescuer is to save a child fallen into a bore well safely within less amount of time. This project has a lifting tool that grabs the child's hand and saves the child smoothly. Here we use sensors that capture temperature and air quality (ppm) and feed them to the controller. A high torque servo motor is used to lift the tool predominantly. A LCD display is used to view the output from temperature sensor and air quality sensor. Joystick module operates the servo motor and a night vision camera is used to live stream the child momentary actions.

Keywords: Temperature sensor, Air quality sensor, Joystick Module, Camera, LCD Display and Servo motor.

I. INTRODUCTION :

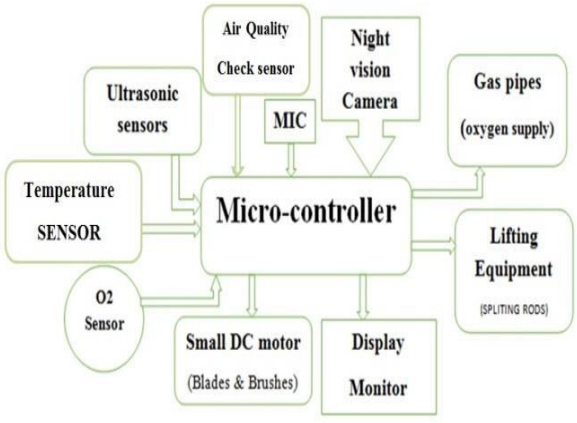

Fig 1: Block diagram

For the past fifteen years our country faces a lot of Social issue like lack of women safety, water shortage for agriculture, Bore well accidents, fisherman getting arrested or killed, etc. In these years around 50+ children were died in bore well accidents. Thus we sorted out to solve this problem by making a rescuing tool for saving the child from a long underground pipeline which is more efficient compared to existing claw type tool grabs the head of the child cause neck injury to child. Another existing method lifts the child by body where a armour type coat covers the child body around which is impossible when there is no space for armour to get through.

II. HARDWARE FEATURES :

There are Three Modules connected with Processor sensor module, Driver Module and Display Module.

SENSING MODULE:

The Temperature Sensor and the air quality sensor collect the data and send the values to the Arduino UNO.

DHT11 SENSOR:

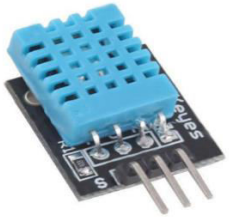

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Fig 2: Temperature and Humidity sensor

DHT 11 sensor captures the atmospheric temperature and humidity. In this project we use this in order to sense the temperature inside the bore well.

MQ135 AIR QUALITY SENSOR:

MQ 135 is air quality sensor that senses ammonia, alcohol, Nitrous oxide, benzene, smoke and Carbon dioxide. It has high sensitivity to Ammonia, Sulfide and Benzene steam, also sensitive to smoke and other harmful gases. It is with low cost and suitable for Air quality monitoring in parts per million (PPM).

Fig 3: Air Quality Sensor

CONTROLLING MODULE :

ARDUINO UNO:

Arduino UNO does the main role here. It acts as a bridge for all input and output components. Sensor data of DHT 11 andmq135 is taken and feeded to the controller. This data is shown in LCD display. Mg-995 servo motor is controlled by arduino through motor driver thus to lift the tool up and down.

SERVOMOTOR:

Fig 4: Servo Motor

MG 995 is the servo motor used in lifting the child from the pipeline. The pulley connected with rope is attached with tool and helps to move the tool inside the pipeline.

MONITORING MODULE:

NIGHT VISION CAMERA:

This Night vision camera plays the important role thus we can monitor the live streaming until the child gets rescued.

LCD DISPLAY WITH I²C :

LCD 1602A is the display module that show the current live value of temperature and air quality. This i2c module reduces the pin configuration from 16 to 4 pins.

Fig 5: LCD

III. RESCUING TOOL :

RESCUING TOOL 1:

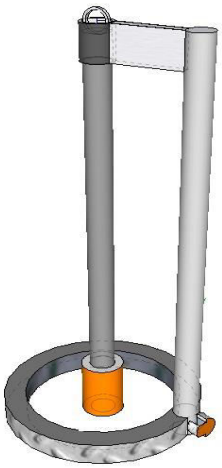

Fig 6: Prototype Tool 1

This is tool that has a soft grip at the bottom and joined with a mini motor this motor used to move the soft grip and lock the child hand within the grip smoothly. How the child grabs the tool? It is possible by connecting a neon color light above the handle so the child gets attracted towards it and touches the handle. This is possible for a child who can't have the

correct age understand our language. If the Child can understand our language we can use attach a speaker to the tool.

RESCUING TOOL 2:

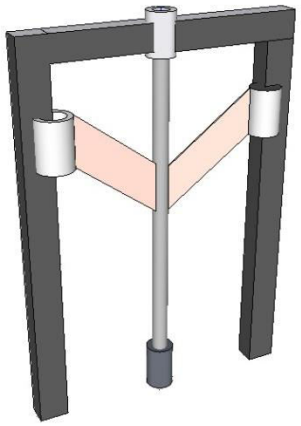

Fig 7: PrototypeTool 2

As we got an idea from a TV show, we found that this type of tool can be made and we also tested this tool. This tool has a band cloth roll both sides. If the child grabs the activity area the roll along with the rod rotate and give a tight grip with the hands.

RESCUING TOOL 3:

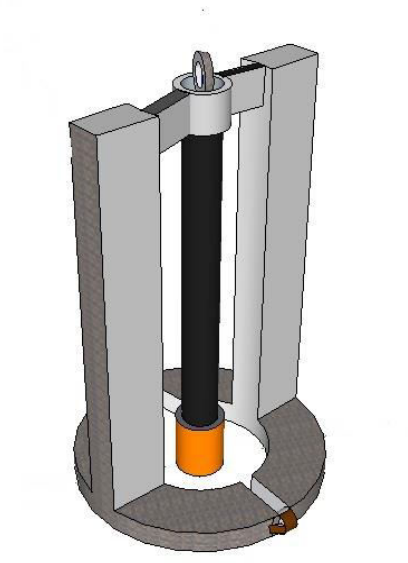

Fig 8: PrototypeTool 3

This tool is similar to tool 1 as it has two semicircular soft grips that lock the child hand both sides (motor is place on both sides).

Note: Depending Upon the situation tools can be replaced with the rope and sent for operation.

IV. REFERENCE:

1. Minnajose, MariyaJessy, Vismaya K D &Swathi,"Bore well rescue Robot" International Research Journal of Engineering and Technology (IRJET)Volume 3 Issue 3
2. Sree Nanda, BineethPatil, Sai Lakshmi "Journal of Emerging Technologies and Innovative Research (JETIR)Volume 4 Issue 5
3. Low cost Sensor usability with Arduino UNO by SayanMukhopadhaya published at http://www.researchgate.net at June 2016.
4. Controlling Servo motor MG995 using L298N motor driver with joystick module connected with Arduino. https://www.instructables.com/id/Arduino-2-Servos-Thumbstick-joystick/ Author Ali Hamza published on March 2018.
5. Setting up DHT11 humidity sensor on Arduinohttp://www.circuitbasics.com/how-to-set-up-the-dht11-humidity-sensor-on-an-arduino/ published by Circuit basics.