

Design and Fabrication of Camera Guided Rescue System for Child Trapped in Borewell

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Abstract— In this paper, design and construction of Camera guided rescue system for child trapped in bore well is discussed which can be used to save the child who falls into an open dry bore well. The need for such a system arises from day-to-day requirements in our society. Rescue teams such as NDRF team in India is used to work for such conditions. The arrangement is equipped with night vision camera for better view and gear arrangement for better control. It also has a hand drive which system which enables to lift the system which and electricity and no skills are required to drive this which system.

Keywords: Gear arrangement Night vision camera; Winch system; Double screw system

I. INTRODUCTION

In recent years, there has been an increase in the bore well mishaps wherein children fall into open bore wells. This project aims at designing a system which is capable of rescuing the child with ease and without causing any discomforts such as scratching to the walls of the well. The system is a light weight, a compact arrangement that has a cable rope to which a deflated balloon is a tied, which goes beyond the depth of struck and is inflated.

The system is controlled by a rotating rope drum, a cable rope, and a movable jaw arrangement. The design of the system is adaptable to the diameter of the bore well which varies from 4 inches to 12 inches. The depth of struck and posture of struck of the child is monitored through camera using live detector. The project is intended to reduce the time taken to rescue and risk involved in the operation.

The project is inclined towards the rescue process, which is technique oriented. The depth of struck and posture of struck play a key role in the rescue operation, obtained by the camera interfaced with the live detector. Uninterrupted supply of oxygen is provided so as to eliminate any respiratory issues. Upon determination of Depth of struck & posture of struck, the deflated balloon is sent to a depth beyond and inflated. Upon inflation, cable rope is raised so as to bring the balloon to and it is ensured that the trapped child is seated on the balloon comfortably.

Using movable jaws arrangement, the child's body is locked tight and is sandwiched between jaws. The entire sandwiching system is raised gradually so as to ensure safer lifting. The gripper used in the system can bear up to a weight of 15 kilograms. The lift operation is monitored by the camera. In recent years, there has been an increase in the bore well mishaps wherein children fall into open bore wells. This project aims at designing a system which is capable of rescuing the child with ease and without causing any discomforts such as scratching to the walls of the well. The system is a light weight, a compact arrangement that has a

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II. MECHANISM USED

The pinion is attached to the double threaded screw which is given power through Johnson motor which is driven used a 12-volt dc battery and a remote control system. The pinion is welded with the double threaded screw and when the screw is rotated the jaws which have internally threads and connected to the double threaded screw, also rotates hence the jaws gets grip on victim. As shown in figure 1.

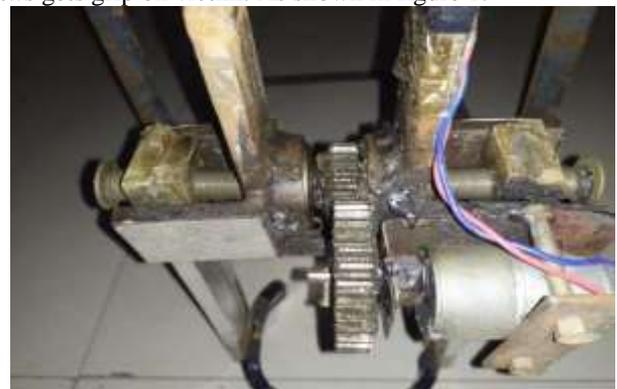


Fig. 1: Mechanism Used in Arrangement

III. COMPONENTS USED

- 1) Winch system
- 2) Night Vision Camera

- 3) Aluminum jaws
- 4) Gear Arrangement
- 5) Double Threaded screw
- 6) Flexible steel wire
- 7) Bearing
- 8) Base frame
- 9) Pulleys
- 10) Johnson motor

IV. SELECTION OF MATERIALS

In the context of design, the main goal of material selection is to minimize cost while meeting product performance goals. Systematic selection of the best material (Table 1) for a given application begins with properties and costs of candidate materials.

Parts Of Arrangement	Material Used
Jaws	Aluminum
Gear	Cast steel
bearing	Chrome Steel
Double threaded screw	Mild Steel

Table 1: Material Selection

V. PROPOSED METHODOLOGY

This work is aimed at fabrication of a rescue system to work in bore well rescue operations. The system consists of a moving jaw arrangement with curve jaws, deflated balloon and surveillance camera with live detection. The gripping mechanism takes hold of the child's body and lifted up gradually. An entire rescue operation is a process-based approach. Operation begins with determining the Depth of Struck along with the Posture of Struck of the child, obtained by the surveillance camera interfaced with live detection facility. Raising the whole system of a child held in the gripper along with the balloon simultaneously will not harm the child much and also can be done at the very lesser time compared to the existing parallel well technique.



Fig. 2: Fabricated design

VI. PROCESSES INVOLVED IN FABRICATION

A. Electric arc welding

These processes use a welding power supply to create and maintain an electric arc between an electrode and the base material to melt metals at the welding point. They can use either direct (DC) or alternating (AC) current, and consumable or non-consumable electrodes. The welding

region is sometimes protected by some type of inert or semi-inert gas known as a shielding gas, and filler material is sometimes used as well.

B. Machining

Machining is a term used to describe a variety of material removal processes in which a cutting tool removes unwanted material from a work piece to produce the desired shape. The work piece is typically cut from a larger piece of stock which is available in a variety of standard shapes, such as flat sheets, solid bars, hollow tubes, and shaped beams. Machining can also be performed on an existing part, such as a casting or forging.

C. Threading

Threading is the process of creating a screw thread. More screw threads are produced each year than any other machine element. There are many methods of generating threads, including subtractive methods.

VII. FUTURE PROSPECTS

- A balloon can be introduced for the best result
- Oxygen pipe can be supplied to reduce suffocation
- More accurate design can be made using some advance manufacturing techniques

VIII. CONCLUSIONS

Though this project had some the main purpose of our project is to rescue the victim from bore well with more safety and in less time. If delay happens in the rescue of the victim, then there are more chances for the victim to lose life. In order to avoid that we are using night vision camera with marking wire to measure the distance at which the victim is present so that we can easily get through the victim. In addition, our project consists of 2 limbs in the rescue unit which provides better grip for the victim during rescuing operation. Thus our project will be of high safe and low cost for the rescuing operation.

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