

Wired Controlled Robotic Arm

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Abstract: The paper deals with the design and implementation of Wired Controlled Robotic Arm, which is used to perform the basic activities like, pick and place the objects with out human effort. In this paper, a Robotic Arm is designed and modeled, Wired controlled Working arm, the work done by the robotic arm would be precise, as the servo motor of 6v and 12v motors were used in the project. But the motors are used according to the work of the size of the project. By the wired controlled robotic arm the project is controlled by wires and operated by switches. In today's world robots and their works are compulsory for industries and manufacturing companies. Other than Robotics this types of arms are used for other source of fields also.

Keywords: Robotic arm, Servo motors, Battery, Spur gears

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I. Introduction

A Robot is an intelligent agent capable of carrying objects and also pick and and place the objects from one place to another place without human effort. Practically, a Robot is basically an electro-mechanical machine that is guided by computer or electrical switches. Robots can be classified as Autonomous, Semi-autonomous and remotely controlled[1]. Robots are widely used for variety of tasks such as cleaning drains, service stations and the work that are considered danger to handled by the humans that should performed by the robots. The Robotic arm is similar to human arm by providing grips to the handle of robot arm. Humans today do all the tasks involved in the manufacturing industry by themselves. However, the robotic arm can be used for various tasks such as Drilling, Welding and removal of medical wastes and may more, [3]. The self implementation of desired motors are increase the speed of the operation, In the implementation process, the necessary components of structure ICs, Blocks, and power supply are all assembled on the PCB[8]. The advantage of wired controlled robots are no need of programs, only the wire controls were used. Robotics involves elements of mechanical and electrical engineering, as well as the control theory, computing and now artificial intelligence. According to the Robot Institute of America, "A Robot is a reprogrammable, Multifunctional manipulator designed to move materials, parts, tools or specialized devices through variable programmed motions for the performance of variety of tasks [5]. These robots are highly used for small scale industries because, of the capacity of project is low. The holder have a separate motor to hold the objects, By providing more specifications the project capability is increased.

The process of design is clearly explained in the next sections with detailed information regarding the components which are used, followed by the implementation leading to the results and finally ends with conclusion.

II. Design Of Robotic Arm

The Robotic Arm is designed using the switch controller, this process works on the principle of interfacing servos and spur gears. This task is achieved by using perforated plates. The battery emits the power source to the motor it rotates the spur to convert to and flow motion. . This servo will respond with regards to the pulses which results in the moment of the arm [6]. The servo motor and battery are the main components for the wired controlled robotic arm. The process of complete section and motion of the project by providing efficient power source. For the pick and place the robotic arm is used, usually a dedicated module designed specifically for use with servomotors.

The components in short terms,

1. Servo motors
2. Spur gears
3. Preforated plates,

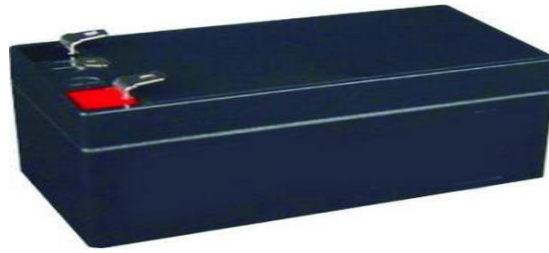


Fig 1 Battery

III. Materials Used

- 1) Perforated plates,
- 2) Servo motors,
- 3) Battery,
- 4) Spur gears,
- 5) Connecting wires,
- 6) Switches,
- 7) Wheels,
- 8) Grippers
- 9) Holders,

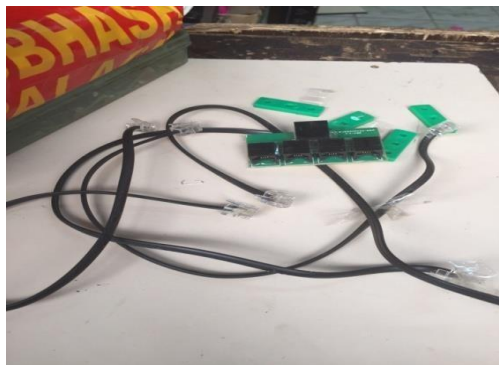


Fig 2 Connecting wires

IV. Servo Motors

Servo motor is defined as error sensing feedback control which is used to correct the performance of a system. Servo Motors are DC motor that servo mechanism for precise control of angular position. The servo motors having definite speed of rotation. Their rotation is defined by the shape and size of the motor speed. An acceleration of speed of servo motors are combined by various discription. A servo motor is a motor, which forms part of a servo mechanism.[8]. The servo motors are placed because of comfortable position. These servo motors used in the Robotic arm and grippers. The specifications of the servo motors are following;

- 1) Weight -45g
- 2) Operating voltage- 6V
- 3) Operating speed - 0.25sec

V. DPDT Switches

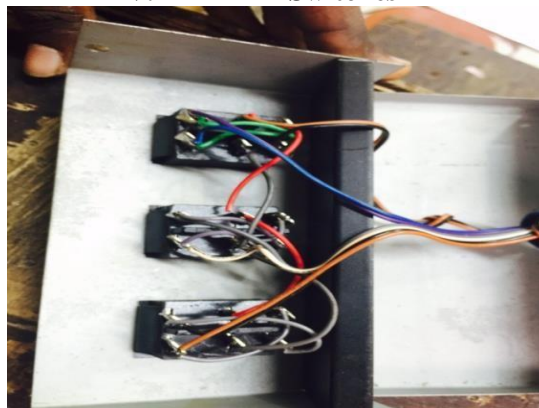


Fig 3 DPDT Switches

VI. Working Principle

The working principle of the wired controlled robotic arm can be clearly defined in the diagram. If the human needs the help of robotic arm the main role is to operate the Robot carefully, by providing comments or the operator should handle carefully, it should also possess the capability of sending specific orders to the manipulator which as to be carried out in terms of positions or velocities of its final effectors. There are three kinds switches are in the control panel, one is for forward and reverse, and the another one is for upward and downward directions, and similarly for holding the objects. These three unit of system are in one end of connections operated by human. Therefore, the implementation of the task is done by using the Robotic arm, The functions of moving and rotating the arm of the project is may be continuous process or whenever it wants may applied for the work. Now these functions are needed to be an integrated with the applications are then used to solve the particular task. The maintenance of the project is low by providing loads or work the capacity of the material is limited to done the process of the task.

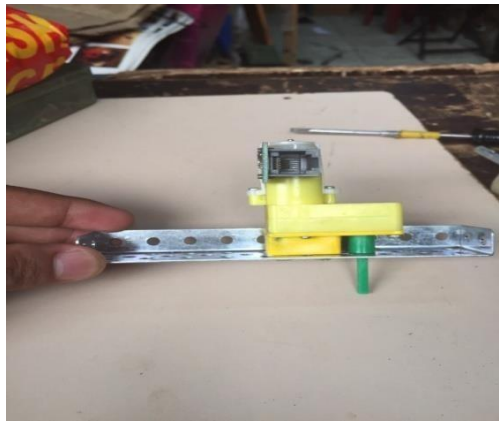


Fig 4 servo motor

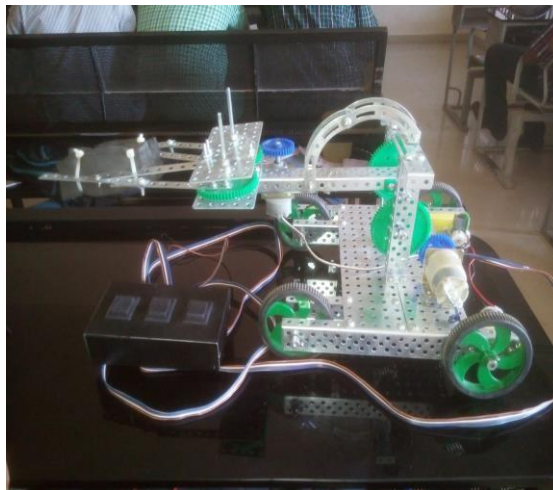


Fig 5 Working Model

VII. Applications

- By using Robotic arm, it perform the similar activities like welding, gripping, etc., for Eg. According to the type of Robots the system of working process is also changed like assembled the parts of objects.
 - In hospitals, the hazardous wastes are completely handled by Robots.
 - For pick and placed the Robots are highly used by providing cameras the robots accuracy is constant.
 - In case of handling bombs and or explosive materials are proper.
 - The robot arms can be autonomous or controlled manually and can be used to perform a variety of tasks with high accuracy.
 - Shifting of robotic arms may very useful for the change in need of positions.
- Conformation of material handled by the arm while gripping the material is brittle .
- Holding device is capable of differentiate the complete level of approach to transform the objects from the positions.

VIII. Conclusion.

From the above project made on Wire Controlled Robotic Arm we come to a conclusion of that our robot is designed in such a way that it is perfect in all the aspects ,it can able to move ,pick and place objects up to 1 kg, in other categories it can able to hold heavy weighted objects. In a better and bigger aspects we conclude that this robot can perform its function in highly risky conditions, for military purposes like diffusing bombs where its very dangerous for human beings to perform this act. It is a better way because it eliminates nuclear waste without harming humans and highly protect us from harmful radiations. Thus we can conclude that this robot can perform activities for human benefits and also perform activities where human hand cannot reach.

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