

# Development of Pick And Place Robot

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**Abstract:** The pick and place robot is designed so that user pick the obstracle and remove from the path. Also it pick the object and put in the specific location. The pick and place robot is successful accomplishment of the small scale assembly task. The capability of gripper was checked by doing different experiments such as picking rectangular, triangular shaped objects as well as in day today life it is important. In this mechanism wire connection is used for operating the robot with the help of circuit. In that onboard power supply is used.

**Keywords:** Gripper, circuit connection, motors, robotic arm etc.

## 1. INTRODUCTION

Robotics is the branch of engineering science in which it is deals with the study of minimizing the industrial problems and also the automisation in the industry. It is also used to solve the societal problems. with the help of robotics the continuity of the work is maintained. Where the manforce is not continue all time. Also the accuracy is maintained by the application of robotic knowledge. For preparing this robot the following equipments are used (1)chassis (2) wheels (3) motors (4) battery (5) acrylic sheet (6) rubber for gripping purpose (7) aluminium rod (8) wire (9) clamps (10) gear (11) DPDT switches.

During preparation the drilling, cutting and soldering etc operation are done. For drilling purpose the 5mm, 6mm and, 2mm drills are used. The cutting operation is done to cut the acrylic sheet to get the required shape for the robotic arm. Also this operation is used for reducing the length of the bolt. For the cutting operation hexa blades was used. As well as for soldering operation the soldering gun was use. the filler material is aluminium .reference[1-8]

## 2. DEVELOPMENT OF MODEL

### 2.1 .Gripper

For automated processes schmaltz offers gripper systems for end-of -arm robot tooling that are ready to connect. For developing the grip between the robotic arm the object or

the obstacle gripping mechanism is used. The rubber is used for maintaining the grip. also a gripper is a device which enables the holding of an object to be manipulated. the easier way to describe the gripper is to think of the human hand. Just like hand, a gripper enables holding, tightening, and releasing of an object.

## 2.2. Robotic arm

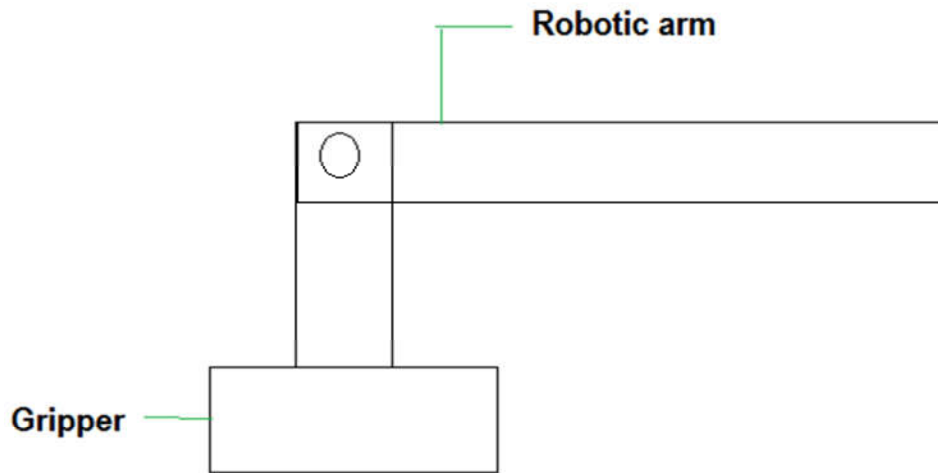


Figure 1. Robotic Arm

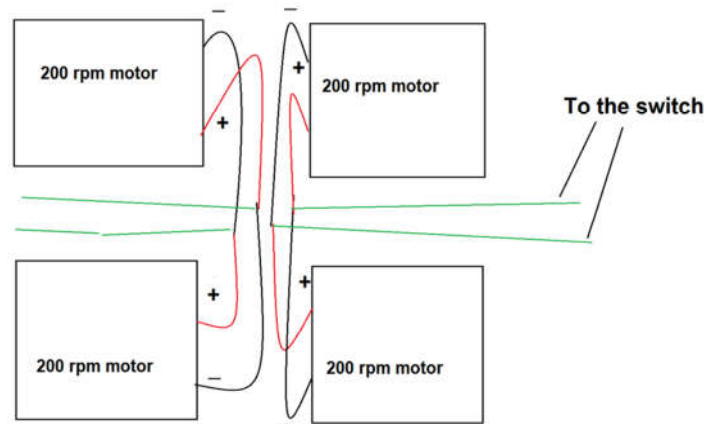
The material used for the robotic arm is acrylic sheet in this pick and place robot. The robotic arm has a mechanical structure that alter its form using a group of electric motors as well as gear mechanism for the linear displacement as shown in figure (1)

## 2.3 Robot body

Robot bodies consists of metal, plastic and similar materials. Inside the body the four motors are connected to four wheels in specific manner. With the help of clamps the motor is fitted, and the robotic arm is connected to the motor with the help of aluminium rod for up and down motion of the robotic arm. The drilling operation is also done on the body for fitting the clamps. The motors which are connected to the body are connected each other in parallel connection as shown in block diagram.

The positive terminal of one motor is connected to the negative terminal of other motor placed in one side as shown in below fig(2). Also the same way, another terminal that is the negative terminal of one motor is connected to the positive terminal of another motor. In that way the other two motors are also connected to each other in same way is also shown in below block diagram.

The turning movement of the robot these four battery plays an important role. Because of the parallel connection of the battery two wheels placed on the one side are rotated in the same direction. This helps the turning movement of the robot in left and right direction.



**Figure 2. Motor Connection**

## 2.4 Battery and Remote

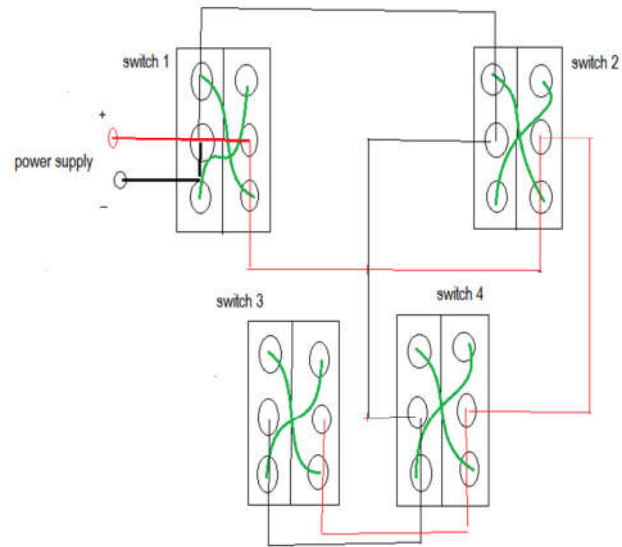
Battery is placed on the robot body due to which the power supply is on board. Battery is placed on the body with the help of two clamps.

In remote the four switches are used. The first switch controls the two wheels on left side. The first DPDT switch operate the two wheels on left side in same direction. The second switch controls the two wheels on right side. The second DPDT switch operate the two wheels on right side in same direction.

The third DPDT switch control up and down motion of the robotic arm which is connected by aluminium rod.

The last switch controls the gear motion. also these switch is used for the picking and placing the object. The last switch controls the movement of the robotic arm. as shown in fig (3)

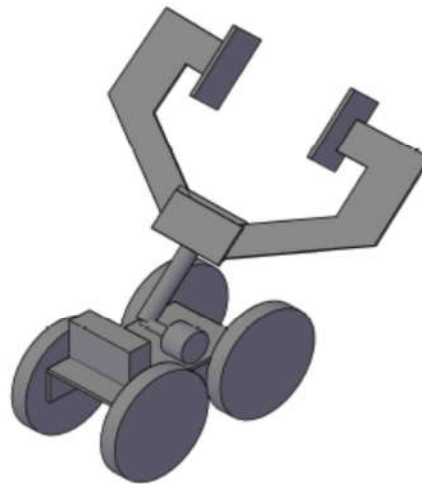
There are six motors are used in the robot. Out of which four are of 200 rpm to the each wheel. One is 60 rpm which is connected to the aluminum rod for upward and downward motion. Remaining one is of 30 rpm which is connected to the gear assembly. All motors are of the 12 V. The battery is of also 12 V. The battery which is connected in this model is of 1A.



**Figure 3. Circuit Diagram**

## 2.5 Actual model

In the below figure there is a assembly of the pick and place robot. In that figure 3-dimensional view represent for the better understanding.



**Figure 4. CAD CAM Diagram**

## 4. Results

With the help of these robot the easily picking and placing of the obstacles / objects of weights approximately 150 gm.

## 4. Conclusion

This is used for many societal applications such as where the human cannot go easily and there is difficulty to go in any region in that area this robot is used.

## 5. Future scope

The main drawback of the give robot is that the motion of the gripper mechanism is covered the only the two axes which are X and Y. In future it may be moves in all the three axes that is X, Y and Z axes.

The motion of these in three direction are important. Because the difficulties present in the path can be easily complete.

For continues motion of the robot the wireless mechanism is very helpful. To overcome these difficulties the arduion is used. Because of the wireless mechanism the many difficulties in path is easily overcome.

## REFERENCES

- [1] S. R. Nair, "Design of an Optically Controlled Robotic Arm for Picking and Placing an Object", *International Journal for Scientific and Research Publications*, vol 2, (2012), pp. 1-3.
- [2] P. Singh, A. Kumar and M. Ashish , "Design of robotic arm with Gripper and End effector for spot welding", *Universal journal of mechanical Engineering*, vol .3,(2013), pp. 92-97.
- [3] Dr. R. K. Bansal, "a textbook of engineering mechanics", *Laxmi publication* ,(2005)
- [4] B. Singh, N. Sellappan and P. Kumaradhas , "Evolution of Industrial Robots and their Applications", *International Journal of Emerging Technology and Advanced Engineering*, vol. 3, (2013), pp. 763-768.
- [5] Sanket Kumar R. Patel, "A Review on Design and Analysis of Pick and Place Robot using Vacuum Gripper" *International Journal for Scientific Research & Development* , vol. 3, (2015), pp.108-110.
- [6] A. Rahman, "Design, Analysis and Implementation of a Robotic Arm- The Animator", *American Journal of Engineering Research* , vol.2, (2013) , pp.298-307.
- [7] B. O. Omijeh, ,R. Uhumwangho, and M. Ehikhamenle, "Design analysis of a remote controlled pick and place robotic vehicle", *International Journal of Engineering Research and Development*, no. 5, (2014) ,pp.57-68.
- [8] K. Chandrasekaran, A. Djuric, and W. H. ElMaraghy, "Selection Catalogue of Kinematic Configuration for Pick and Place Application". In *Enabling Manufacturing Competitiveness and Economic Sustainability*, (2012), pp. 41-46.