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# PICK AND PLACE ROBOT VEHICLE USING PIC MICROCONTROLLER AND ANDRIOD APPLICATION

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***Abstract:-*** ***As of late the business and day by day schedule works are seen as more pulled in and actualized through mechanization by means of Robots. The pick and spot robot is one of the advances in assembling ventures which is intended to perform pick and spot operations .The well known idea of a robot is of a machine that looks and works like . An individual. The business is moving from present status of mechanization to Robotization, to build profitability and to convey uniform quality. One kind of robot ordinarily utilized in industry is an automated controller or just a mechanical arm known as pick and spot robot. It is an open or shut kinematic chain of unbending connections interconnected by mobile joints. In this paper pick and spot robot is been planned which plays out its activity by utilizing android by means of article location application and PIC microcontroller .The fundamental obligation of microcontroller is to create beat which are applied to the DC Motors for finishing the ideal undertaking. In this examination three DC engines a reused in which two are used to control the development of robot and one isused to control The gripper. The activity of structured pick and spot robot has been tentatively confirmed. Reproduction and test Results are introduced and talked about.***

***Keywords:- DC motor, PIC, pick, spot, Android, object, detection, application, robot ,controller.***

## 1. INTRODUCTION

Mechanical technology is the part of building science and Technology identified with robots, and their plan, assembling, application, and auxiliary mien. Apply autonomy is identified with gadgets, mechanics, and programming. A few analysts center around totally computerizing an assembling procedure or an errand, by giving sensor based knowledge to the robot arm, while other attempt to cement to establishments on which a large number of the fundamental ideas in mechanical technology are constructed. In this exceptionally creating society time and labor are basic imperatives for consummation of assignment in enormous scopes. The mechanization is assuming significant job to spare human endeavors in the vast majority of the standard and every now and again conveyed works. One of the major and most generally performed works is picking and setting from source to goal. Present day industry is progressively turning towards PC based mechanization for the most part because of the requirement for expanded profitability and conveyance of final results with uniform quality. The firmness and for the most part significant expense

of hard-computerization frameworks, which have been utilized for mechanized assembling errands previously, have prompted an expansive based enthusiasm for the utilization of robots equipped for playing out an assortment of assembling capacities in an adaptable situation and at lower costs. The pick and spot robot is a microcontroller based mechatronic framework that identifies the article, picks that object from source area and spots at wanted area. For location of item. Pick and spot robots will be robots that can be customized to truly get an item and spot it some place. These robots are mainstream among entrepreneurs who require expedient and exact robotization applications and material taking care of frameworks. The current pick and spot robots depend on [1] sensors to recognize the items. Sensors, for example, infrared sensor can be utilized. These sensors can't work when the article is set at far separation [2] Human mediation is required so as to move the robot from one spot to other which requires the need of pc and web associations. In this way these elements brings about multifaceted nature and cost. Therefore every one of these downsides are overwhelmed by planning a pick and spot robot that takes a shot at android by means of item location application advancement and PIC microcontroller.

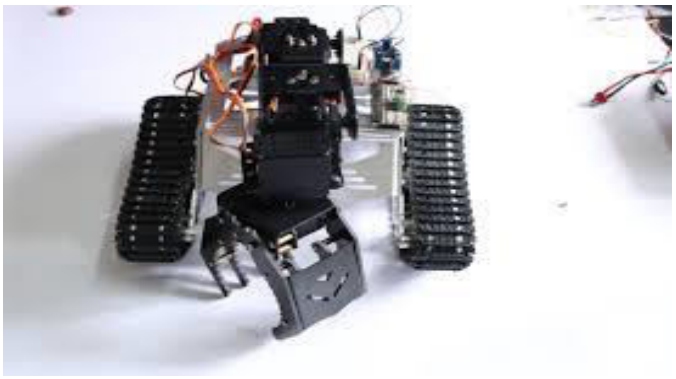

**Fig.1 Pick and place robot**

## 2. THEORY

John Iovine [1], in this book various aspects of designing a Robot is described. It deals with different types of Arm design, controlling techniques, vehicle design etc. ER. Rajput, in this book the operation and control of robots is discussed. Arduino cookbook, in this book details and methods of interfacing hardware components such as DC motor, Servo motor and RF Transmitter and Receiver is been discussed The other references listed in the references section discusses similar concepts in its various fields such as color identification and segregation robot, robot for surveillance, pick and place robot controlled using android etc. Present day industry is increasingly turning towards computer-based automation mainly due to the need for increased productivity and delivery of end products with uniform quality. The inflexibility and generally high cost of hard-automation systems, which have been used for automated manufacturing tasks in the past, have led to a broad based interest in the use of robots capable of performing a variety of manufacturing functions in a flexible environment and at lower costs. The pick and place robot is a microcontroller based mechatronic system that detects the object, picks that object from source location and places at desired location. For detection of object. Pick and place robots are robots that can be programmed to literally pick an object up and place it somewhere. These robots are popular among business owners who require speedy and precise automation applications and material handling systems. The existing pick and place robots are based on [1] sensors to detect the objects. Sensors such as infrared sensor can be used. These sensors cannot work when the object is placed at very far distance [2] Human intervention is required in order to move the robot from one place to other which requires the need of pc and internet connections. Thus these factors results in complexity and cost. Thus all these drawbacks are overcome by designing a pick and place robot that works on android via object detection application development and PIC microcontroller

### 3. LAW OF ROBOTICS

1. Robot may not injure a human being or allow a human being to come to harm. 2. Robot must obey orders given it by human beings except where such orders would conflict With the First Law. 3. A robot must protect its own existence as long as such protection does not conflict with the First osr Second Law.

### 4. PROBLEM STATEMENT

Problem Statement The pick and place robot being implemented to ease the process of sorting, process of moving heavy materials etc. Usually the transfer process of the heavy materials is being carried out, using man power and if the transfer process is repeated for a period of time, it can cause injuries to the operator. By using the particular robot the operator, will no longer have to bent and lift up heavy loads thus preventing injuries and increasing the efficiency of the work. Operator will make mistakes whether small or big in a while. In the industrial world, the industry cannot afford to take any kind of mistakes. As every mistake is costly whether interns of time, money and material.

### 5. BLOCK DIAGRAM

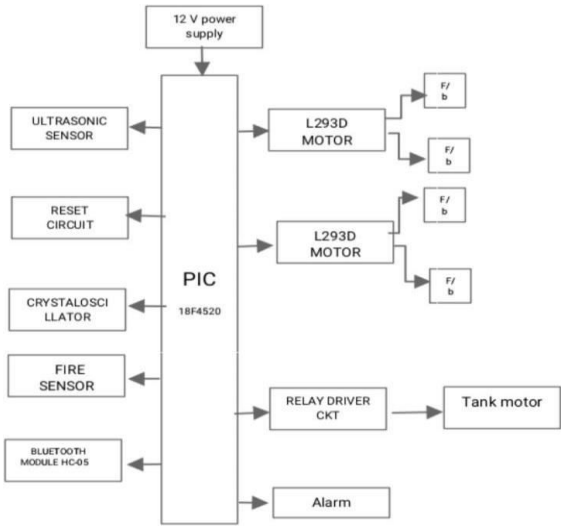


**Fig.2 Block diagram pick and place**

The square graph of the proposed framework is Shown in Figure2.It comprises of a controller IC, Bluetooth module, four DC Motor swith driver IC and force supply .The pick and spot mechanical arm Consists of an automated arm put on a moving vehicle. The vehicle can move along a surface sir separate of it is smooth or unpleasant. It utilizes two engines for the activity and a belt type is connected to the vehicle like in the tanks, for the smooth and solid operation. The pick and spot robot utilizes four engines for the activity of the framework, two for the activity of moving vehicle and two for the pick and spot operation. The pick and spot arm comprises of an arm get together with a jaw, which is just ready to move in here and there direction. There are two engines are for the arm gathering, one for the all over movement and Other for jaw opening and shutting .The most extreme upward and descending movement is constrained by a mechanical press button type switches. It breaks the engine circuit when the arm is at its most extreme situation past which them ot or doesn't pivots. For the controlling of motor, motor driver IC and Atmega328 microcontroller is utilized. The information signal or controlling sign is given from an android gadget , which is interfaced with the microcontroller by a blue tooth module.L293D has 2 arrangement of Arrangements where one set has input1,input2, output1 and output2 and other set hasinput3, Information 4,output 3 and yield 4,according to square outline input 4 in the event that pin no 2 and 7 are high, at that point pin no 3 and 6 are likewise high. For the controlling of ,engine driver IC and microcontroller isused . The information signal or Controlling sign is given from an android gadget, Which is interfaced with the microcontroller by a bluetooth module. L293D has 2 arrangement of Arrangements where one set has input1,input2, Output 1and yield 2 and other set has input3,input 4,output 3 and yield 4,according to square graph in the event that pin no 2 and 7 are high, at that point pin no3 and 6 are additionally high. On the off chance that empower 1and pin number 2 are high leaving pin Number 7 as low then the engine pivots in forward direction .If empower 2 and pin number 10 are

high leaving pin number15 as low then the engine turns in forward direction. If empower 1and pin number 2 are low leaving pin number 7 as high then the engine turns backward direction. If empower 2 and pin number15 are high leaving pin number10 as low then the engine pivots Forward way.

## 6. BASIC METHODS OF PROGRAMMING ROBOTS

There are three basic methods for programming Industrial robots but currently over 90% are programmed using the teach method.

### A Teach Method

The logic for the program can be generated either using a menu based system or simply using a text editor but the main characteristic of this method is the means by which the Robot is taught the positional data. A teach pendant with Controls to drive the robot in a number of different co-ordinate systems is used to manually drive the robot to the desired locations. These locations are then stored with names that can be used within the robot program. The coordinate systems available on a standard jointed arm robot are:-

### Joint Co-ordinates

The robot joints are driven independently in either direction.

### Global Co-ordinates

The tool centre point of the robot can be driven along the X, Y or Z axes of the Robots global axis system. Rotations of the tool around these axes can also be performed

### Tool Co-ordinates

Similar to the global co-ordinate system but the axes of this one are attached to the tool centre point of the robot and therefore move with it. This system is especially useful when the tool is near to the work piece. Work piece

### Co-ordinates

With many robots it is possible to set up a co-ordinate system at any point within the working area. These can be especially useful where small adjustments to the program are required as it is easier to make them along a major axis of the co-ordinate system than along a general line. The effect of this is similar to moving the position and orientation of the global co-ordinate system.

## 7. STEPS OF DESIGN SELECTION OF PRODUCT

From the number of products available we selected the Battery of automobiles for been used in our project. We had number of options for the selection of product, as per our requirement the Battery was matching the conditions. The other products which we considered were as follows:-

**BEARING:-** Due to radial cross section of the bearing, it would be little bit difficult for the Robot Gripper to¬ hold the bearing in it and transport from one place to another holding it. So we rejected this product.

**BAGS OF IRON ORE: -** The fines bagging system was pre-decided but due to the weight limit we switched¬ over the other products.

**CELL PHONE PACKING: -** As due to the light and sensitive parts of the Cell phones we also skipped it as¬ there are chances of causing damage to the Cell phones while holding in the grippers of the Robots.

**BOTTLE PACKING: -** The radial shape of the bottles was not able to grip inside the grippers of the robots.¬ Though pick and place robots are used in bottle packing industries but they are been designed very precisely and are costly so as the grippers are to be such that it can hold the bottles and move towards the decided target.

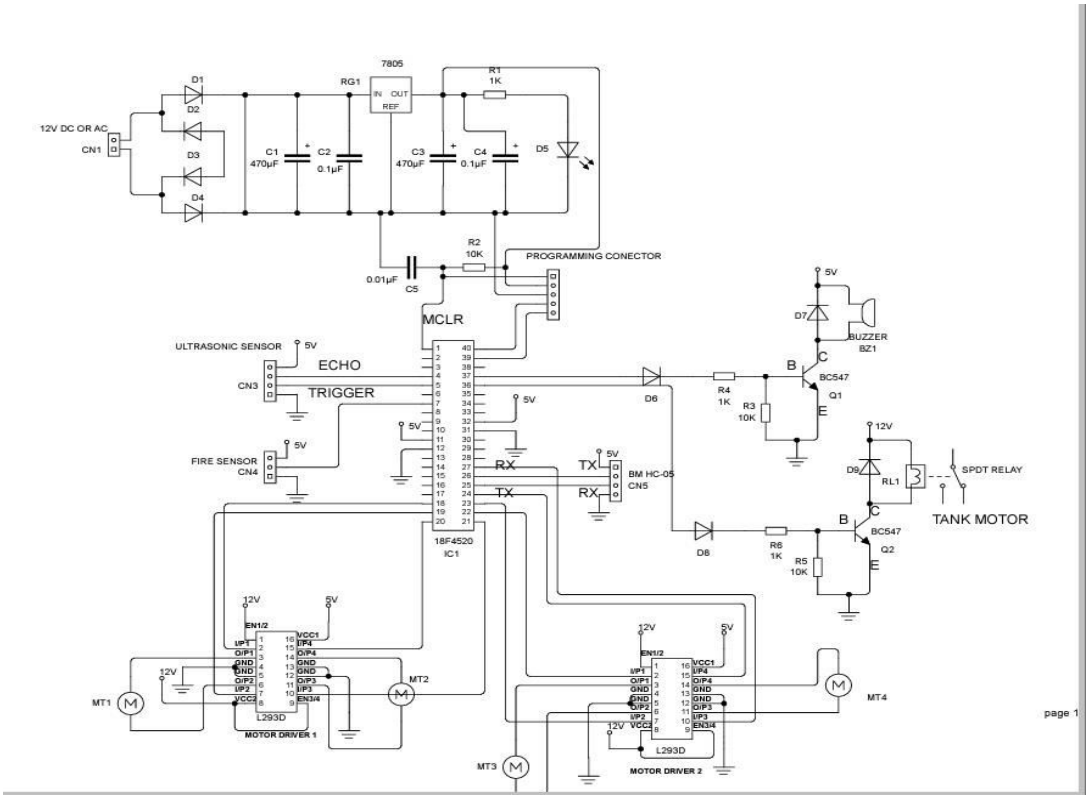


**Fig.3 Circuit diagram pick and place**

**8. WORKS TO BE DONE**

**SELECTION OF PARTS**

Various components of appropriate specifications should be selected so as to complete the fabrication and assembly of the Robot. If the selection is not done properly then the proper working of the robot cannot be obtained. It includes the parts like selection of actuators, motors, sensors etc. Thus the selection procedure of various components is also an important issue for the project work.

**COMPLETION OF MODE**

L Future work is to fabricate and manufacture the complete body structure of the robot, then the assembly of all the manufactured parts are to be done so that the required load is lifted and been transported to the targeted place.

**PROGRAMMING**

Programming of the Pick and place Robot is to be done using a suitable Programming Language. The Robot is to been interfaced with the computer by the programmed software, which will guide the robot to do its job for which it is been programmed. There are numbers of various programming languages available now a days in the market, so the appropriate programming language is to be selected for the programming purpose and the programming is to be done.

## INTERFACING WITH THE COMPUTER

In the industrial design field of human-machine interaction, the user interface is where interaction between humans and machines occurs. The goal of interaction between a human and a machine at the user interface is effective operation and control of the machine, and feedback from the machine which aids the operator in making operational decisions. A user interface is the system by which people (users) interact with a machine. The user interface includes hardware (physical) and software (logical) components. User interfaces exist for various systems, and provide a means of:

**Input, allowing the users to manipulate a system,**

**Output, allowing the system to indicate the effects of the users' manipulation**

After completion of the model of the pick and place robot and selection of programming language both should be interfaced. The interfacing of robot and computer using the software is the most important thing in the project. It should be interfaced using trial and error method, and then final movement should be set using the software's. The movement of robot should be precisely managed causing no harm to the operator, and also the batteries which are to be moved from one station to another.

## 9. APPLICATIONS

**Defense Applications**:-It can be used for surveillance and also to pick up harmful objects like bombs and diffuse them safely.

**Industrial Applications**:-These robots are used in manufacturing, to pick up the required parts and place it in correct position to complete the machinery fixture. It can be also used to place objects on the conveyer belt as well as pick up defective products from the conveyer belt.

**Medical Applications**:-These robots can be used in various surgical operations like in joint replacement operations, orthopedic and internal surgery operations. It performs the operations with more precision and accuracy.

## 10. ADVANTAGES

- They are faster and can get the
- work done in seconds compared to their human counterparts.
- They are flexible and have the appropriate design.
- They are accurate.
- They increase the safety of the working environment and actually never get tired.
- Our robotc an handle dangerous chemicals is Chemical lab or in nuclear reactor labs which are Hazardous to human body.
- Our robot can handle dangerous chemicals is Chemical lab or in nuclear reactor labs which are Hazardous to human body.
- Having a android control facility this robot can perform many tasks that human cannot or Dangerous for human to handle.
- With some modifications this robot can be used for helping the physically challenged people.

## 11. RESULTS

1. To control the displacement of the robotic arm so that the arm can be used to pick and place the Elements from any source to destination.
2. To control the displacement and movement of Robotic arm using android control .

## 12. CONCLUSION

In the whole procedure of ourwork completion we have successfully build android based robot with pick and place robot application. For the completion we have used various applicatio software such as android SDK, Eclipse, PCB WIZARD.The final output of the system is robot control with the android application.

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