SOLAR-BASED LINE TRACKING PICK AND PLACE ROBOT

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Abstract

The objective of this project is to design a solar based robot for pick and placeapplication.This project is used in the industries for pick and spot application. Mainly used formaterial handling application.This project is designed by following blocks, solar panel, Microcontroller, trackingsensor, Amplifier, Signal conditioning unit, Driver circuit, Motor, Robot pick and placemodel and Keypad.

Keywords: line tracking, pick and spot robot, solar, motor, servo gripper..

1. Introduction

The pick and spot industrial robot is used to take care of or disengage parts or tools to orfrom a machine, or to transfer parts from one machine to another [1]. A variation of a "pickand place" robot is used to build and undo unit loads on a pallet.A pick and spot industrial robot offers new opportunities for flexibility and repeatability inconsumer goods and other industries [2]. This robot is a production developer, analyst andsystem integrator in the food, pharmaceutical, chemical, logistics and material handlingindustries. The robot saves time, space and money and its tough industrial designensures it can address the issues of the most demanding production operationsWhile there is no single correct

definition of "robot" a typical robot will have severalor possibly the entirety of the following properties [3]. It is artificially created.It can sense its environment, and manipulate or interact with things in it.It has some ability to settle on choices based on the environment, often usingautomatic control or a preprogrammed sequence.It is programmable [4].It moves with one or more axes of rotation or translation.It makes dexterous coordinated movements.It moves without direct human intervention [5].It appears to have intent or agency.The last property, the presence of organization, is important when people areconsidering whether to consider a machine a robot, or just a machine [6].

2. Methodology

Solar power is the main source of power used to operate the system. The solarpanel generates power from direct sunlight then the produced power is stored to battery.The battery power is send to control unit. The solar panel consists of rectangular exhibit ofsolar cells. A solar cell or photovoltaic cell is a device that converts solar energy intoelectricity by the photovoltaic impact. Photovoltaic is the field of technology and researchrelated to the application of solar cells as solar energy.The object sensor senses the object and gives corresponding signals. Theseelectrical signals are extremely small mill voltage signal, so it is given to amplifier circuit. Theamplifier circuit is constructed with operational amplifier which acts as power amplifier.Then the amplifier signal is given to signal conditioning unit which is constructed withoperational amplifier. In this circuit operational amplifier go about as comparator and generatethe square pulse given to microcontroller. It will work according to our object as of now wehave programmed.In this project key cushion is consists of set of keys which specify the operation such asarm here and there. The key cushion is interfaced to microcontroller through l/O port. Here the

microcontroller is the flash kind reprogrammable microcontroller in which we have alreadyprogrammed.When the key is pressed, the microcontroller activates the driver circuit as permentioned in the program. The driver circuit is constructed with transistor which acts asswitch to control the relay. The relay output is directly connected to motor which isattached in the robot.For a model when arm down key is pressed, the signal from the key is given tomicrocontroller. So the microcontroller activates the corresponding relay thorough thedriver circuit. Now the arm moves to down Side. Ihrough this way arm is controlled for pickand place application.In our project we are using secondary sort battery. It is battery-powered Type. A battery is one or more electrochemical cells, which store chemical energy and make it available as electric flow. There are two types of batteries, primary (disposable) and secondary (battery-powered), both of which convert chemical energy to electrical energy. Primary batteries must be used once because they use up their chemicals in an irreversible reaction. Secondary batteries can be re-energized because the chemical reactions they use are reversible; they are re-energized by running a charging current through the battery, yet in the opposite direction of the discharge current. Secondary, also called battery-powered batteries can be charged and discharged oftentimes previously wearing Out. In the wake of wearing out some batteries can be reused. Batteries have gained popularity as they got portable and useful for some purposes. The use of batteries has made numerous environmental concerns, such as toxic metal pollution. A battery is a device that converts chemical energy directly to electrical energy it consists of one or more voltaic cells. Every voltaic cell consists of two half cells Connected in series by a conductive electrolyte. One half-cell is the positive electrode, and the other is the negative electrode. norades do not touch one another however are electrically connected by the electrolyte, which can be either which has its either solid or liquid. A battery can be simply modeled as an ideal voltage source

own resistance, the resulting voltage across the load depends Watery's internal resistance to the resistance of the load. on the ratio of When the battery is fresh, its internal resistance is low, so the voltage across the load is almost is almost equivalent to that of the battery's internal voltage source. As the battery runs down and its inter reases, so the voltage at its terminals decreases, and the battery's ability to deliver internal resistance increases, the voltage drop across its internass its internal resistance power to the load decreases.

A wheel is a circular device that is fit for rotating on its axis, facilitating movement or transportation or performing labor in machines. A wheel together with a pivot overcomes friction by facilitating motion by rolling. In order for wheels to rotate a moment needs to be applied to the wheel about its axis, either via gravity or by application of another outside force. Common examples are found in transport applications. More for the most part the term is also used for other circular objects that rotate or turn, such as a Ship's wheel and flywheel. The wheel most likely originated in ancient The wheel is a device that enables efficient movement of an object across a surface where there is a force pressing the object to the surface. Common examples are a truck drawn bya horse, and the rollers on an aircraft fold mechanism. The wheel is not a machine, and should not be confused with the wheel and pivot, one of the simple machines. A driven wheel is a special case, which is a wheel and pivot. Wheels are used in conjunction with axles, either the wheel turns on the hub or the hub turns in the object body. The mechanics are the same in either case. The normal torce at the sliding interface is the same. The sliding distance is decreased for a given distance of movement. The coefficient of friction at the interface is usually lower.

A sensor is a device that measures a physical quantity and converts it into a signal which can be perused by an observer or by an instrument. Sensors are used in

regular objects such as touch-sensitive elevator buttons and lamps which dim or brighten by touching the base. There are also innumerable applications tor sensors of which most people are rarely mindful. Applications include cars, machines, aerospace, medicine, manufacturing and robotics. A sensor's sensitivity indicates how much the sensor's output Changes when the measured quantity changes. The figure 1 shows the overview of pick and spot robot.

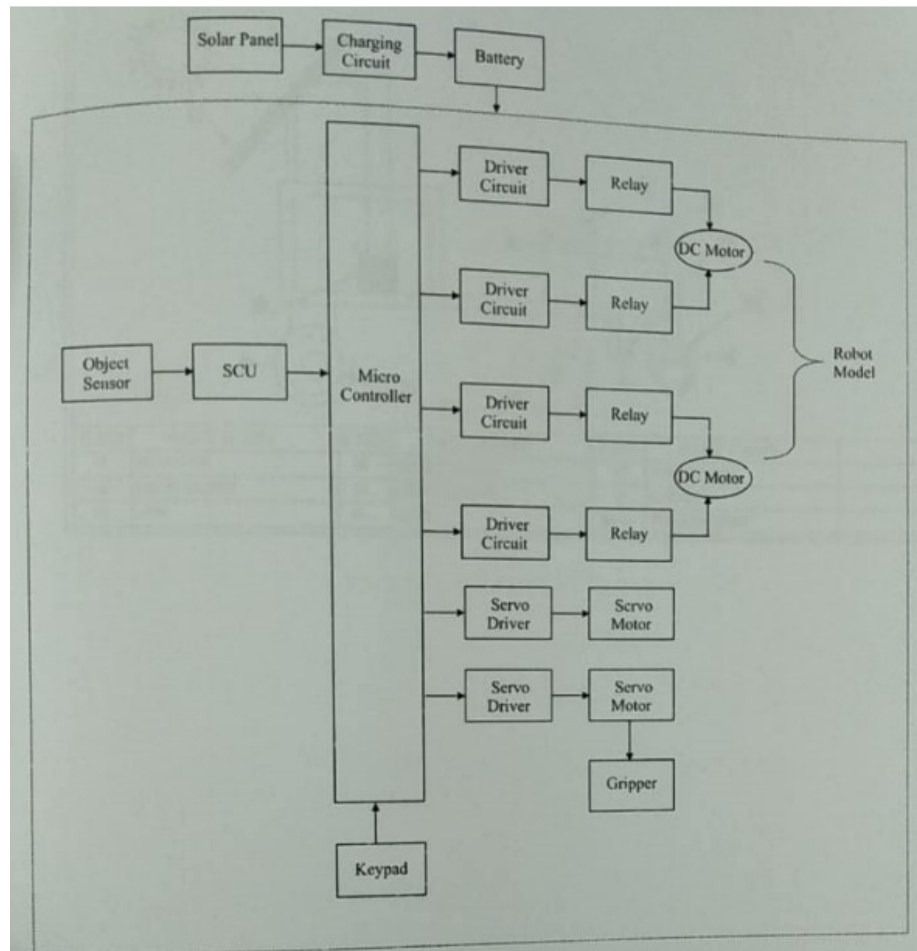The figure 1 shows the overview of pick and place robot.

Figure 1: overview of pick and place robot.

A relay is an electrically operated switch. Current flowing through the coil of the Creates a magnetic field which attracts a switch and changes the switch contacts. The Hh lease can be on or off. So relays have two switch positions and they are double throw (changeover) switches.

3. Conclusion

The project carried out by us will make an impressing mark in the field of robotics. This proiect has also diminished the cost involved in the concern. The project has beendesigned to perform the required task taking minimum time.We are successfully completed the project work "SOLAR BASED LINETRACKING PICK AND PLACE ROBOT".We like to thanks the directorate of technical education (DOTE), For giving us theopportunity to gain the practical knowledge in the engineering field by doing this projectWork as part our curriculum. In execution this project we were exposed to numerous problem and difficulties facing such difficulties are solve through problems solving technique. Thisgives us extraordinary confidence and courage which are essential for success engineer.Some of the things learned are.Team work development. Situation handling. Trouble shooting Implementation of new ideasApplication of learned knowledge.

References

1. Industrial robotics- Groover

2. Design data book-P.S.G.Tech.

3. Machine tool design handbook -Central machine tool Institute,a. Bangalore.

4. Strength of Materials -R.S.Kurmi

5. Manufacturing Technology -M.Haslehurst.

6. Design of machine elements- R.s.Kurumi