

# Automatic Object Printing Machine Using PLC

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**Abstract**— This Research paper is based on the concept of Automatic Rubber Stamp object printing machine by using plc.

In order to ensure the reliable printing mechanism this replaces traditional hand stamping on any object. In this automated system we replaces traditional hand stamping method by automatic Printing. Now this automatic object printing machine consist of conveyor belt mechanism on which we place any object to be printed also we interface two sensor that IR sensor and limit switch to detect the object we use DC motor to run the conveyor belt and when the conveyor starts IR sensor will detect the position of the object. When object is detected IR sensor will indicate a signal to the PLC and the PLC will stop the conveyor motor, the second motor will start to print the stamp on the object. After specified time the conveyor will start again and process will continue to print next object.

**Keywords**— Siemens logo PLC, IR sensor, conveyor belt, DC motor.

## I. INTRODUCTION

The conventional method for object printing and counting is manual, time consuming and in non-automatic form. Continuous printing and counting leads to hand and eye fatigue and requires lots of efforts and also affects the accuracy to results so the manual method must be replaced by computer vision as the result of this method is erroneous and time consuming.

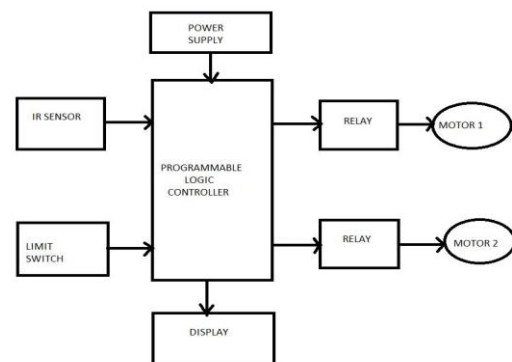
Automatic printing of object has received significant attention because automatic printing is reliable and reproducible. This not only reduces manual efforts but also gives more time for marketing also prevent danger which might occur when human being works in hazardous environment. Automation greatly improves the productivity and it is highly scalable.

## II. PROPOSED TECHNIQUE

In this paper, we propose a system which uses low cost and open source software for achieving the goal of printing the objects. We use PLC with IR Sensors to detect the object. The proposed model has a conveyor belt run with the help of dc motor and corresponding pulleys at the motor and its opposite ends which constantly run at a desirable speed with the help of PLC. The conveyor belt is starts with the help of 16 rpm DC motor and then the Material is fed on the feed-side of the belt

as we interface this mechanism with the IR sensor it will detect the object on the conveyor as the object is detected the conveyor motor stops after that the stamp motor of 20 rpm will start and the printing on the object is done and meanwhile the counting of object will display on the PLC display. after that the stamp motor will stop and the conveyor motor start and then next object will landed on the rotating conveyor belt and that will be detected by IR Sensor. The pulley that drives conveyor belt is called drive pulley or transmission drum the other one only used to change conveyor belt movement direction—is called bend pulley. Drive pulley is driven by the DC motor. It can also have a guiding pulley which just guides the motion of the conveyor belt between the drive and the bend pulley.

block diagram:



### 1)DC Motor :

Geared DC motors can be defined as an extension of DC motor which already had its Insight details demystified here. In this we used to DC Motors. 10 rpm motor will be used for running the conveyor belt mechanism and 20 rpm will be used for stamping mechanism.

### 2) IR Sensor :

IR LED emits infrared radiation. This radiation illuminates the surface in front of LED. Surface reflects the infrared light. Here we used the proximity sensor. we place this sensor at the centre of the conveyor belt and it will sense the object whenever it is detected.

### 3)Relay :

A relay is an electrically operated Switch. Many relays use an electromagnet to mechanically operate a switch, but other

operating principles are also used, such as solid -state relays. Relays are used where it is necessary to control a circuit by a separate low-power signal, or where several circuits must be controlled by one signal. The first relays were used in long distance telegraph circuits as amplifiers: they repeated the signal coming in from one circuit and re-transmitted it on another circuit. Relays were used extensively in telephone exchanges and early computers to perform logical operations.

#### 4) Limit Switch :

A limit switch is a switch operated by the motion of a machine part or presence of an object. They are used for controlling machinery as part of a control system, as a safety interlocks, or to count objects passing a point. A limit switch is an electromechanical device that consists of an actuator mechanically linked to a set of contacts. When an object comes into contact with the actuator, the device operates the contacts to make or break an electrical connection. Limit switches are used in a variety of applications and environments because of their ruggedness, ease of installation, and reliability of operation. They can determine the presence or absence, passing, positioning, and end of travel of an object. They were first used to define the limit of travel of an object; hence the name "Limit Switch".

#### 5) PLC:

A programmable logic controller (PLC), or programmable controller is an industrial digital computers. Which has been ruggedised and adapted for the control of manufacturing processes, such as assembly lines. Or robotic devices, or any activity that requires high reliability control and ease of programming and process fault diagnosis. In this we use the Siemens logo PLC with LCD display. It has 2 digital input and two digital output. PLC used 24SMPS power supply from mains. 12 v power supply will be given to DC Motor and limit switch from PLC.

### III. ADVANTAGES:-

1. Maintenance cost.
2. Multiple copies conveniently.
3. Reservation Circular Knowledge.
4. Accuracy is more.
5. More Reliable

### IV. DISADVANTAGE:-

1. More Expensive
2. Large Circuit

### V. Application

It is used vastly in industrial applications

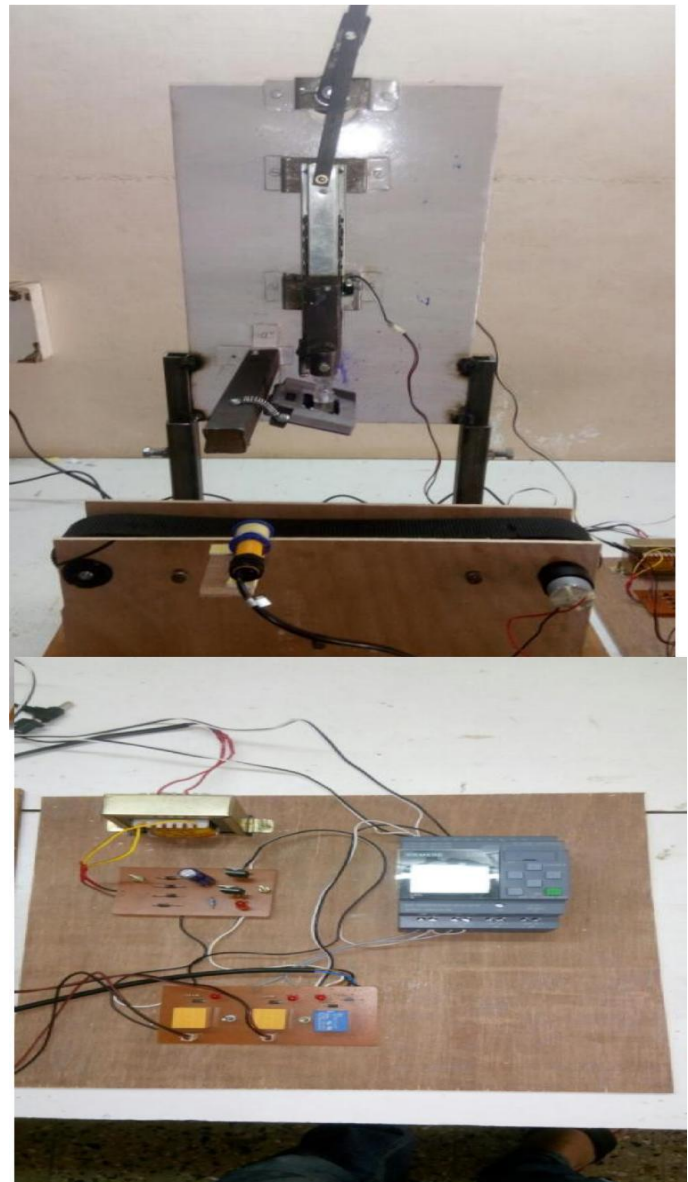
### V. EXPERIMENTAL RESULTS

1. Hardware implementation of the Automatic Load Sharing of Transformers using PLC was developed using Siemens logo PLC.
2. Simulation was done in logo software and the output was verified.
3. Due to this software and ladder diagram the automatic printing is done.
4. Hence the object print automatically.

### VI. PROBLEM STATEMENT

Now this automatic object printing machine consist of conveyor belt mechanism on which we place any object to be printed and also we interface two sensors which are IR sensor and limit switch to detect the object. We use DC motor to run the conveyor belt and when the conveyor starts IR sensor will detect the position of the object. When the object is detected IR sensor will indicate a signal to the PLC and the PLC will stop the conveyor motor, the second motor will start to print the stamp on the object. After specified time the conveyor will start again and process will continue to print next object.

### VII. HARDWARE RESULT



## VIII. SURVEY COMARISION

PARAM ETERS	Literature 1	Literature 2	Literature 3	Our Implemen
COST	High	High	High	Low
SPEED	60rpm	100rpm	60rpm	45rpm
TIME	Moderate	Slow	Moderate	Fast

## IX. CONCLUSION

In this project “Automatic object printing machine” In order to ensure the reliable printing mechanism this replaces traditional hand stamping on any object. In this automated system we replaces traditional hand stamping method by automatic Printing. Now this automatic object printing machine consist of conveyor belt mechanism on which we place any object to be printed and also we interface two sensors which are IR sensor and limit switch to detect the object. We use DC motor to run the conveyor belt and when the conveyor starts IR sensor will detect the position of the object. When the object is detected IR sensor will indicate a signal to the PLC and the PLC will stop the conveyor motor, the second motor will start to print the stamp on the object. After specified time the conveyor will start again and process will continue to print next object.

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