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Control System Upgradation with Encoder in Printing Machine

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ABSTRACT: This project is to print the date and day with the help of encoder. The process of printing is automated with the help of HMI, sensors, motors, encoder. This process is carried out through ladder logic methodology. The Encoder application machine process is based on the PLC [Programmable Logic Controller] controller. Earlier PLC controllers are huge programme size spare parts are rare, inbuilt programming that we could not change as per the requirements and absolute model which is difficult to learn. The cam shaft mechanism takes over time to assemble the coil position. And also coils pick up and drop step by step process is difficult. To overcome this problem use the advanced PLC controller model SIEMENS-S7 1200 instead of earlier telemachanic PLC controller because in this SIEMENS-S7 1200 model PLC the HMI is used to display the calibre positions.

KEYWORDS : Encoder, HMI, PLC Controller.

I. INTRODUCTION

Fixing dye plate as per the requirement. Then fixing mounting plate using centering pin to fix mount in window position . Then, preparing ink cup and scrapper blade. In ink cup pour 2 drops of printing thinner to make it drying the scrapper blade is used to wipe the excess ink then Fixing gelating pad, gip it in the enamel pad and fix the spindle. gelating pad is fixed in the diplate and it will print in the paintedmaterial

1) Manualoperation

Switch on the main supply.

Switch on the manual pushbutton in HMI.

Check the function of the arms using pushbuttons by inching. Use the HMI to control the ejection function.

2) Automaticoperation

Switch on the main supply.

Switch on the auto pushbutton then the ejection process will be continued.

OBJECTIVE

To overcome from the absolute mechanism and the inbuilt programming. To set the coil positions accurately which is used to pick up and place the components and to display its position in degrees by HMI.

II. RELATED WORK

[1] Johannes heidenhhain -encoder- Encoders are sensors that generate digital signals in response to movement. Both shaft encoders, which respond to rotation, and linear encoders, which respond to motion in a line, are available. When used in conjunction with mechanical conversion devices such as rack-and-pinions, measuring wheels, or spindles, shaft encoders can also be used to measure linear movement, speed, and position.

[2] MallikarjunHudedmani-Programmable Logic Controller in Automation -The programmable Logic Controller (PLC) is the central controlling unit in the industry or a process. The effective operation of the process and safety considerations if programmed appropriately can meet the required objectives. The present technical paper briefly distinguishes the present automation systems and the past technologies to identify and explore the capabilities of PLCs for any process. The advent and application of microprocessors, microcontrollers and new specific tools such as PLCs, Supervisory control and data acquisition (SCADA) and Distributed control systems (DCS) have increased productivity, accuracy, precision an defficiency.

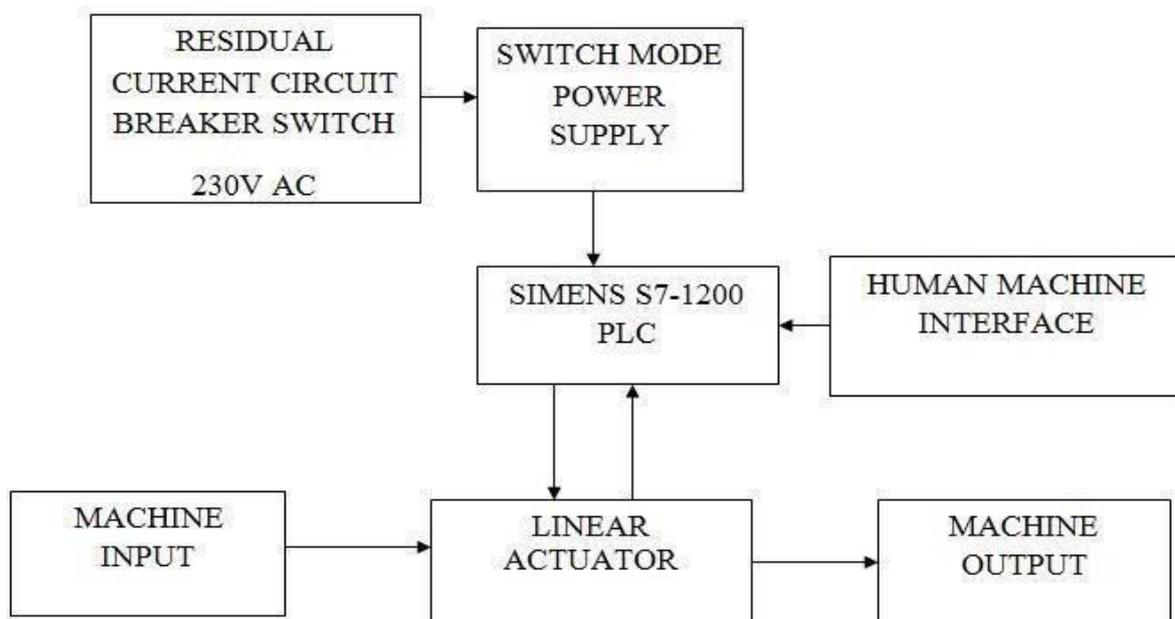
[3] These systems reduced human intervention and increased the flexibility in the process control.[2] Ted Mortenson : “LIMIT SWITCH - Oct 19, 2020”, Ted Morten son have proposed a method that operated by a physical force applied to it by an object. Limit switches are used to detect the presence or absence of an object. These force were originally used to define the limit of travel of an object, and as a result, they were named Limit Switch.[3]ZhengChunjiao :“THE APPLICATION AND DEVELOPMENT OF PRINTING MACHINE - 2019”,Zheng Chunjiao have proposed a method that the photoelectric sensor is to reflect the measured objects changes by light signal, and then convert the light signal into electrical signals by optoelectronic components. Usually the photoelectric sensor is composed by light source, optical access and optical components.[4] SumanAdhikari :“OPERATOR MACHINE CONTROL USING SIEMENS PLC AND HMI - December 2018”,Programmable Logic Controllers (PLCs) are the small digital computers used in modern days control applications. They are flexible to program according to users need and are capable of generating control signals that can control machines and processes in industry. The PLC used for this project is Siemens SIMATIC S7-1200, CPU 1214C DC/DC/DC model. It is a powerful controller with many capabilities. It has functions that can perform counting, measuring, closed-loop control, and motion control.

[4] Greg P. Zimmerman, “PROGRAMMABLE LOGIC CONTROLLERS AND LADDER LOGIC - April 2008”, 00”Another method that uses the Ladder logic or ladder diagrams are the most common programming language used to program a PLC. Ladder logic was one of the first programming approaches used in PLCs because it borrowed heavily from the relay diagrams that plant electricians already knew. The symbols of these diagrams look like a ladder - with two side rails and circuits that resemble rungs on aladder.

III. METHODOLOGY

Filled ink cup and scrapper unit moves once machine power is on. Ink filled in inscription area of dye plate and scrapper blade wipe the excess ink around inscription area. In the same time pad fixed arm moves from one side to other side and pick the ink from dye plate inscription and return back to other side and print in the component.

BLOCK DIAGRAM



PRINTING PROCESS

- **MANUAL FIXING DYE PLATE:**
Fixing the dye plate as per the requirement.
- **FIXING MOUNTING PLATE:**
Using centering pin to fix mount for window position.
- **PREPARING INK CUP & SCRAPER BLADE:**
In ink cup pour 2 drops of printing thinner for drying the ink. Scrapper blade is used to wipe the excess ink in the plate.

IV. EXPERIMENTAL RESULTS



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Department of ECE, Adhiyamaan College of Engineering, Hosur, Tamilnadu, India



V. CONCLUSION

This process is carried out through ladder logic methodology. The Encoder application machine process is based on the PLC [Programmable Logic Controller] controller. To overcome this problem use the advanced PLC controller model SIEMENS-S7 1200 instead of earlier telemachanic PLC controller because in this SIEMENS-S7 1200model PLC the HMI is used to display the caliber positions. The project on coil unloading machine using the PLCs with the help of encoder.

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