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Temperature Controller Three Part Drying Machine

Subbaiyah R¹, Indhumathi. S², Mounisha. P³, Mownikha Sree. K. R⁴, Nivetha. S⁵

¹Senior Associate Professor, ^{2,3,4,5}UG Students, Dept. of ECE

Sri Shakthi Institute of Engg and Technology, Coimbatore, TN, India.

Abstract: This article analyzed the temperature control system of the dyeing machine in the textile industry, adopted the technology of PLC to automatically control the temperature and realized the automatic temperature adjustment in the work process of the dyeing machine. The spot adjustment justify that this method could fulfill the basic requirement of the dyeing machine to the temperature. The wet fabric after dyeing, is dried by using this new designed process. The fabric is passed through three compartments at different temperature. The steam is applied at all three compartments for drying the fabric. Blower, exhaust fan and nozzle adjustment are also involved in this process.

Keywords: dyeing machine, PLC, wet fabric, nozzle adjustment.

I. INTRODUCTION

In current scenario, one of the modern need is cloth which is becoming very colorful. Dyeing the fabric and drying them safely become more complicated. In order to reduce the manual work, we have proposed an idea named "Temperature Controller Three Part Dying Machine". The wet fabric after dyeing is dried by using this process. The fabric is passed through three compartments at different temperature. The steam is applied at all three compartments for drying the fabric. The blower is used for managing the temperature around the chamber. The exhaust fan is used to avoid the overheating of the chamber. The nozzle adjustment which is used in this process helps to maintain the fabric in the perfect position.

A. Applications

Industries are facing difficulties because of burning of the fabrics in the dryer machine due to overheating. But in this proposed process the temperature is controlled automatically if the temperature in the chamber reaches the fixed temperature and this helps to avoid burning of the fabrics. In this method, in the case of emergency the process can be stopped in the middle.

B. Objective

The main objective of this project is to sense the temperature of the chamber. The LCD display used in this process will display the temperature of the chamber. This project is used for automatic drying of a wet fabric. It also used to reduce the manual work in the textile industries. The aim of the project is to control the temperature of dye in all the three compartments and also to set the respective temperature of fabric in every compartment and to maintain it. The compartment which is mentioned here is the part through which the fabric goes in or out.

II. LITERATURE SURVEY

This article analyzed the temperature control system of the dyeing machine in the textile industry, adopted the technology of PLC to automatically control the temperature and realized the automatic temperature adjustment in the work process of the dyeing machine. The spot adjustment proved that this method could fulfil the basic requirement of the dyeing machine to the temperature. The textile machinery manufacturing of China has been quickly developed for almost twenty years and has acquired great achievements, and the technical level and product stability of textile machinery have been fully enhanced. The automatic control of the textile machinery takes the sports control as its core, and is assisted by the textile technical parameters. In recent ten years, the electric power electronic technology, computer control technology and network Communication technology have been applied and extended in the control and production management of the textile machinery quickly, which make the mechanical and electronic integration level of China fully enhanced.

The parameters of the textile technology are numerous, which generally includes temperature, pressure, flux, liquid position, length, speed and displacement. The dyeing technology of the textile has strict requirement of the temperature, and the temperature

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Insulated Cu Wires

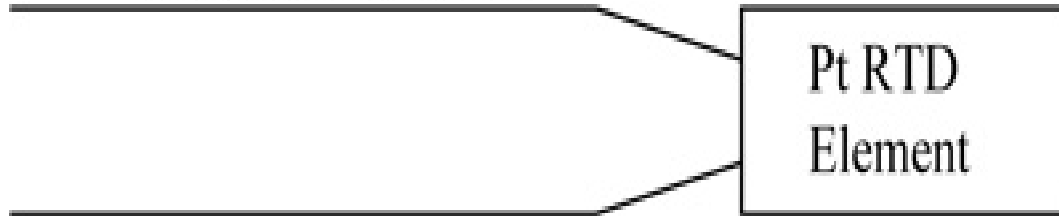


Fig 2 RTD Element

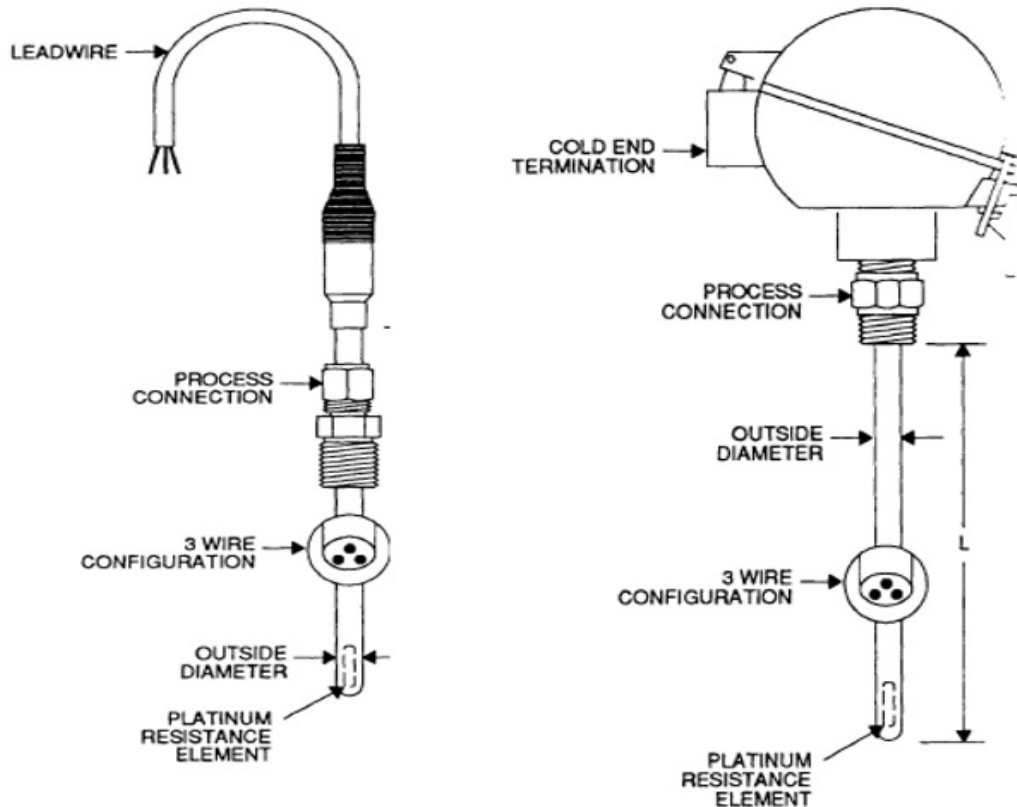


Fig 3 RTD Sensor

B. Programmable Logic Controller

A programmable logic controller, PLC, or programmable controller is a digital computer used for automation of typically industrial electromechanical processes, such as control of machinery on factory assembly lines, amusement rides, or light fixtures. This can be used as storing procedures, handy extending principles, functions of sequential/position control, timed counting and input/output control are widely applied to the field of industrial automation control.

C. Main Module: Dvp28sv2 11t

The new generation DVP-SV2 PLC is the high-end model of the Delta DVP-S series. It provides larger program capacities and data registers for more demanding and complex applications.

- 1) Very High-speed pulse output: 4 sets of 200kHz pulse output
- 2) Supports max. 4 hardware 200kHz high-speed counters
- 3) Increases many motion control instructions to meet the applications that require high-speed and high-precision positioning control such as labelling machines, packaging machines and printing machines?
- 4) Offers linear / arc interpolation motion control
- 5) Provides up to 16 external interrupt pointers

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Fig 4 Main module

D. Extension Module: DVP16SP 11R

In this extension module DVP16SP 11R is used. Here there are 8 inputs pins and 8 outputs pins are used. And the total number of extension module used is five.

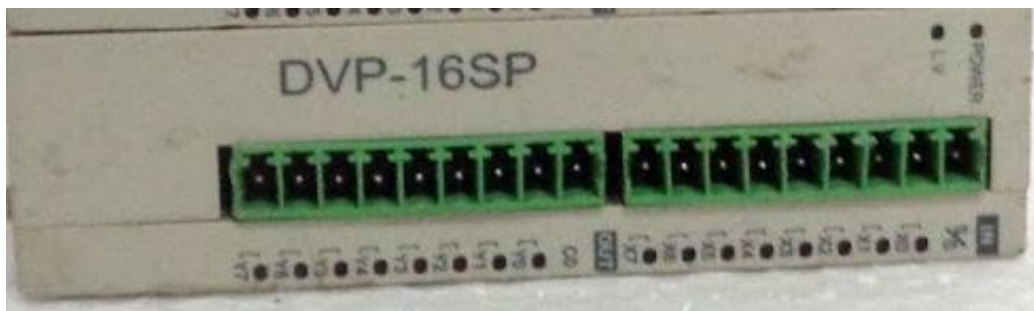
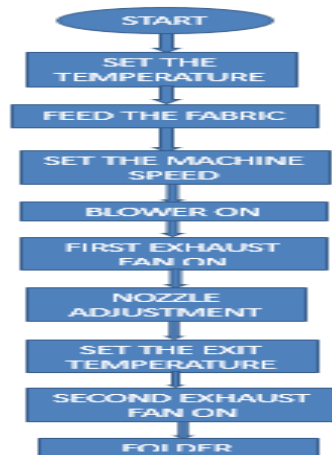


Fig 5 Extension module

V. RESULTS AND DISCUSSIONS

As shown in the below flowchart the when the dryer machine starts after inserting the fabrics in the machine. The temperature is set to control the overheating and also to maintain the temperature. The fixed temperature for the first will decrease till the end (the first compartment have the highest temperature and the second has lower than the first one and the last one have the least temperature is set than other compartment).after setting the temperature the fabric is feed into the first compartment for drying and the machine speed is also set manually (according to the cloth thickness the machine speed is manually fixed). When the fabrics are in then stream will be allowed in the first compartment and respectively. Once the stream is in then the blower is on in order to spread the temperature around the compartment. When the temperature exceeds the original temperature then the valve in the compartment closes and the exhaust fan is on. There is a nozzle adjustment in order to maintain the fabrics in same position.



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. VI. CONCLUSION

Automatic closing of the valve after the proposed temperature is reached. This helps the fabrics to dry in exact temperature which will not make the fabric to burn and also the nozzle adjustment which will maintain the position of the fabric in the same position which will result in equal flow of temperature.

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