The Overview of Intelligent Cloth Inspection Machine

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Abstract: Now many textile companies to use more fabric defect detection testing methods of doing in front of the player, and Inspection Machine operation is based on a series of operations of the analog signal, the traditional Inspection Machine in the staff up to 200 defects found within one hour attention of staff to maintain up to 20-30 minutes, more than this time staff will produce fatigue, speed manual fabric inspection is only 5-20 m / min, more than this rate staff will appear leak test. This not only affects human health, but also reduces productivity. This paper presents the concept of Intelligent Cloth Inspection Machine, and takes a brief description, in order to have a new breakthrough in the study of late.

1 INTRODUCTION

Inspection Machine is a necessary equipment for detecting a former garment industry production of cotton, wool, linen, silk, chemical fiber and other special large format, double-width and single fabric. Process of Inspection Machine includes defect detection, straight, playing volume series of processes. It is mainly used to test the thick material, heavy cloth, oxford cloth, comb weaving material, fabric inspection, Chubb, the amount of code, rolling and folding. Types of Inspection Machine include: knitting Inspection Machine, weaving Inspection Machine, no tension test volume, multifunction Inspection Machine, needle shed dual Inspection Machine, denim Inspection Machine, weaving comb Inspection Machine (Chung-Feng Jeffrey Kuo, 2009).

Overseas Inspection Machine has been used as a relatively mature textile equipment, while research in all aspects of domestic Inspection Machine is not mature, and cannot keep up the pace of development of textile industry.

2 COMPARISON OF TRADITIONAL AND INTELLIGENT CLOTH INSPECTION MACHINE

2.1 Method of Operation about Inspection Machine

(I) The Traditional Cloth Inspection Machine provides hardware environment, continuous segments expand fabrics, and adequate light source; by sight of the operator, we can acknowledge cloth and color defects, and Inspection Machine autocomplete remember long and package finishing work (Chung-Feng Jeffrey Kuo, 2008).

(II) Intelligent Cloth Inspection Machine with intelligent defect detection device, image acquisition and analysis system in real time, images and detect defects circumstances collected is transmitted to IPC, IPC analysis by the outcome of the Inspection Machine sends commands to control test boot volume machine, reverse, brake and other operations.

2.2 The Basic Structure of Inspection Machine

2.2.1 The Traditional Inspection Machine

The basic structure of a Traditional Cloth Inspection

Machine includes:

1) Fabric back solution, shuffling and re-winding device
2) The inspection cloth station, a light source
3) Mnemonic devices
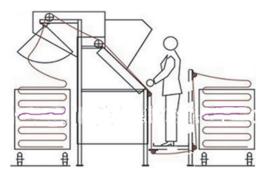4) Fabric finishing equipment
5) Start, reverse and brake units

Figure 1: The Traditional Inspection Machine.

2.2.2 The Intelligent Inspection Machine

Intelligent Cloth Inspection Machine includes post-mortem cloth station, master-slave motor, inverter, IPC, image acquisition and analysis system, tension sensor, record length and so on (K. L. Mak, P. Peng, 2008).
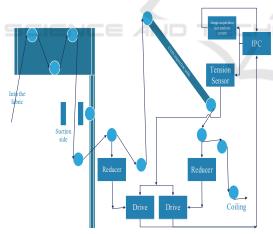

Figure 2: The structure.

2.3 The Advantages of the Intelligent Inspection Machine

The Traditional Cloth Inspection Machine offers hardware environment of cloth inspection, continuous segments expand fabrics, and adequate light source; by sight of the operator, we can acknowledge cloth and color defects, the Traditional

Cloth Inspection Machine autocompletes remember long and package finishing work (Radovan Stojanovic, 2001). The Intelligent Cloth Inspection Machine with the image acquisition and analysis system in the cloth inspection process is completed by the embedded real-time system control image acquisition and complete defecting detection, and then to collect the images and defect detection situation through Ethernet port to the industrial machine, thereby industrial machine interface displays real-time images captured and defect detection of cases, additionally there will be operation buttons for Inspection Machine, such as start, reverse, brake. Whereby the cloth inspection speed, quality, efficiency is greatly improved.

3 THE PRELIMINARY DESIGN OF INTELLIGENT CLOTH INSPECTION MACHINE

Fabric imported by the main motor drive mechanism through cloth inspection table, and then by the motor pulled into the take-up roll. Cloth inspection table offers image acquisition and analysis system for real-time image capture on canvas and defect detection via Ethernet port transfers the result to the IPC, the Live View image on the cloth IPC, and test roll machine control.
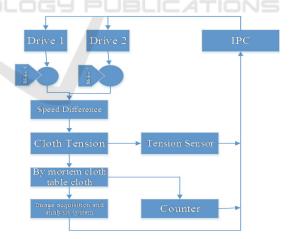

Figure 3: The preliminary design.

I. Textile, printing and dyeing step is to test the volume of the original fabric (newly produced, the more disorderly loose cloth), after inspection / repair after error, roll into a roll, and then go to the next step. Throughout the process, more difficult to solve the problem is the tension in the cloth roll cloth process, since the cloth tension directly

affects the quality of cloth and remember long problem (Hyung Taek Choi, Sung Hoon Jeong, 2001). The Intelligent Cloth Inspection Machine through real-time communication between the drive and the IPC, as well as coordination tension sensor in a timely manner to control the motor speed, so that the tension of the cloth process requirements:

II. Fabric with a certain laxity by cloth inspection table;

III. It sometimes requires motor reversal, in order to find the defect quickly, then it should still maintain fabric original relaxed state;

IV. It finds defects or faults when fast braking.

(2) Traditional Cloth Inspection Machines are both fabric comptroller function, but mostly Inspection Machine uses a drive unit, the fabric pulled directly from the drive roller inspection table cloth through, so easy to cause the fabric stretched so that the comptroller is not accurate, to thin , especially elastic fabric. In demanding situations, the use of loose type transmission, enabling the fabric to maintain a certain slack in cloth inspection process to ensure that the Comptroller, accurate defect detection to meet the requirements:

① accurate record length

② normal fabric, latitude and longitude lines without distortion.

Traditional machines for the introduction of a single motor drag tension transmission; in order to achieve no tension control, transmission control scheme was redesigned by controlling the main drag of the motor speed difference from the two to achieve a loose style fabric inspection.

(3) Defects of Traditional Cloth Inspection Machine are often found by a manual operation, fewer defects detected, slow-mortem cloth, and fabric inspection work will cause fatigue over a certain time, then these factors can cause the error detection, the problem of the leakage test. The image acquisition and analysis system of Intelligent Cloth Inspection Machine in the cloth inspection process is completed by the embedded real-time system control image acquisition and complete defect detection, and then to collect the images and defect detection situation through Ethernet port to the industrial machine, industrial machine interface displays real-time images captured and defecting detection of cases, there will be operation buttons for Inspection Machine, such as start, reverse, brake. Whereby the cloth inspection speed, quality, efficiency is greatly improved.

4 CONCLUSIONS

With China's accession to WTO, relationships of the domestic textile manufacturers and international famous brand clothing sales business have become more closely, while fabric quality problems and disputes are more and more accurate and reliable testing methods and equipment of fabric close related to the fate of the textile industry and the competitiveness of the international market. Requiring the use of Intelligent Cloth Inspection Machine, on the one hand to improve the defect detection rate, accuracy, on the other hand to improve labor productivity, reduce the number of employment; to adapt to WTO competition on the textile, printing and dyeing industries.

Intelligent Cloth Inspection Machine, it can replace the manual, automatic fabric inspection and grading, cut open, to defect to play tag. Intelligent Cloth Inspection Machine is controlled by the IPC, relied on image acquisition and analysis system fabric inspection, the general fabric inspection speeds of up to 120 m / min, defects were found in the screen that can display and reporting, speed is quick and Intelligent Cloth Inspection Machine can adapt to the high frequency of defects or new defect infrequent. Application of Intelligent Cloth Inspection Machine can classify the fabric, and achieve the subject fabric defect statistics, storage capabilities. Intelligent Cloth Inspection Machine to automate testing the fabric of the road, I believe that I will be for some time through continued research efforts, intelligent inspection technology will walk into the textile fabric enterprises, an important part of automated form.

ACKNOWLEDGEMENTS

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