Design and development of cloth cutting

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ABSTRACT:

I want to make project for mask cloth cutter. I have explain from power supply 230 AC. Tap down for 24 volt 10 ampere voltage is tape download for safety reason now we will drive 4 rubber roller which are good surface. Rubber roller are dried with stepper motor which is very accurate position taking motor per control stepper motor we are using Arduino board is programmed with the help of 4 x 4 keypad with the help of keypad we will provide length of cloth and number of cutting after taking this data Arduino run stepper motor and stop with the help of servo motor we will cut cloth for cutting cloth we are using hot heater crome wire.

Keywords: Power Supply Stepper Motor, 4x4 Keypad, Servo Motor

I. INTRODUCTION

The Mask Cloth Cutter project aims to automate the process of cutting cloth for mask production. It utilizes a combination of electronics and mechanical components to achieve precise cutting of cloth material. There are many different stages in the manufacturing process of industrial garment products, one of these is cutting fabric rolls to print labels, company logos, or cut fabric borders . For an automatic roll cloth cutting machine, the mentioned fabric machines are not still suit-able. It needs an alternative technique. So, this paper suggests an automatic roll cloth cutting machine that can cut fabric rolls without core, specifically in the garment industry. It can effectively improve the sewing process and cost. Firstly, theoretical calculations are formulated for an automatic roll cutting machine. Next, simulations are performed by a combination official and Catia software's. A prototype of fabric cutting machine is manufactured and ex-pediments are carried out.2. Theory of operation Nowadays, there have been many different

II. OBJECTIVE: The main objective of the project is to develop a reliable and efficient cloth cutting system that can streamline the mask production process, ensuring accuracy and consistency in cutting.

II. THEORY OF OPERATION:

Nowadays, there have been many different operating principles of cutting fabric rolls. In this study, a cutting machine without core is proposed. In accordance with the general requirements of the garment industry and the actual conditions of equipment, they also can quickly at-tach the fabric roll to machine. The product can be immediately removed from the machine dur-Ing the operation, and then it can cut the next product. Besides, it can eliminate the possibility of the product being skewered because the cloth roll is always perpendicular to the cutter. Lastly, this machine is convenient in inspection and maintenance.
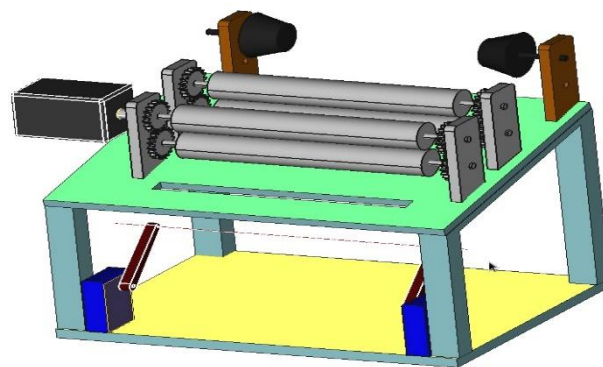

Fig 1- 3D Diagram of Cutting Machine

IV. COMPONENTS USED:

Power Supply: 230V AC converted to 24V, 10A DC for safety reasons.

Stepper Motor: Drives 4 rubber rollers for precise cloth movement. Arduino Board: Controls the stepper motor and interfaces with the 4x4 keypad. 4x4 Keypad: Input device for providing cloth length and number of cuts.

Fig 2 : Steper motor

Servo Motor: Stops the stepper motor for precise cutting. Hot Heater Chrome Wire: Used for cutting the cloth. MG995 Metal Gear Servo Motor is a high-speed standard servo can rotate approximately 180 degrees (60 in each direction) used for airplane, helicopter, RC-cars and many RC model. Provides 10kg/cm at 4.8V, and 12kgcm at 6V. It is a Digital Servo Motor which receives and processes PWM signal faster and better

Fig 3 – Servo Motor

V. DESIGN AND THEORY:

Rolling:

The ceramic anilox roller adopts the plasma method to melt the thermal sprayed chromium oxide powder, melt spray coating on the surface of the metal smooth roller, and firmly combine with the metal roller to form a high-hardness and dense ceramic film, which is ground and polished, and then used The laser beam engraves ink holes on the ceramic surface, multi-beam high-precision laser engraving, regular mesh, smooth mesh, flat bottom, large amount of ink transfer, fast ink discharge, and easy cleaning.

Fig 4 - Rolling

Fig 5 – Ceramic Connector

VI. SYSTEM OVERVIEW :

• The power supply provides a safe and stable voltage for the system.

• The Arduino board controls the stepper motor based on input received from the keypad.

• The stepper motor drives the rubber rollers, ensuring accurate movement of the cloth.

• The servo motor stops the stepper motor at precise intervals for cutting.

• The hot heater chrome wire is activated to cut the cloth at the desired length.

VII. OPERATION:

Users input the desired length of cloth and the number of cuts using the keypad. The Arduino processes this input and commands the stepper motor to move the cloth accordingly. When the specified length is reached, the servo motor stops the stepper motor, and the hot heater chrome wire cuts the cloth. The process repeats for the specified number of cuts.

VIII. ADVANTAGES:

1 Automation reduces manual labor and increases efficiency.

2 Precise cutting ensures uniformity in mask production.

3 User-friendly interface with the keypad for input.

IX. CONCLUSION:

The Mask Cloth Cutter project presents an effective solution for automating the cloth cutting process in mask production. By leveraging electronics and mechanical components, it ensures precision, efficiency, and ease of operation, contributing to the optimization of mask manufacturing processes.

X. REERANCE

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