The Scanning and Separation Device

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Abstract: **As we know the company has many steps to carry out during the distribution process. This project aims to lower the manpower used in these steps in terms of color based distribution. As we have seen the company uses many packaging schemes to ensure that their product is transported to the respected shop with security of preventing it from undergoing any sort of damage. But again a company has many sorts of products to be classified. These products can be classified as per their content. So basically a company uses various color packaging to distinguish between them. Coming back to this project, the main aim of this project is to differentiate these different colored packages so as the manpower required over that process is minimized to almost zero.**

In this project we will use the technique of image processing to differentiate the different colored packages. To do that we have to use certain equipments that can control the flow of current as we are working on low power here, then we need some regulators and capacitive filters to direct the exact amount of power to our microcontroller that will differentiate the colors using Image Processing. After the microcontroller has recognized the color of the package we will direct the different colored packages to their respective conveyor belts. Then we may collect the goods and transport them as per the requirement of the dealer.

Keywords: **Transformer, Rectifier, Filters, Voltage Regulators, Atmega 16 Microcontroller (Atmel), Image Processing, Belt Driving System.**

1.   INTRODUCTION

The main purpose of this project is to distinguish between the colours of the packages and separate them. To fulfil such requirement we need to undergo various steps. These steps are as follows.

Now this project is based on image processing so first of all we need a camera to capture the images. These images are then sent to the PC. After the image capturing part the difficult part comes where we have to differentiate the colors. So we send these images to the Microcontroller using a USB to USART port. The microcontroller used over here is AVR microcontroller.

We have prepared a program in MATLAB to differentiate the colors. This program will be given to the Microcontroller. And also the program where the Microcontroller decides which color box to deliver on which conveyor belt. Now we also need a proper 5V power supply for the Microcontroller that we have to make by converting the 230V A.C supply to 5V D.C supply. So after deciding the program and the power we will provide motor driver I.C through the Microcontroller such that for example, if RED color box comes 1st motor will be activated and that coloured box will be pushed by an arm to another belt or storage. Similarly if another color say BLUE color box comes we can drive another motor through the motor driver I.C and separate it on another belt or storage. And for the GREEN coloured we can just let it go on the main belt till end and send it to storage. Now this process can be performed with as many colors as we want.

We have added an LCD through the Microcontroller that displays which coloured box was just scanned and also count how many boxes of same color went through the belt. We also have added an LED array such that it shows which coloured box just went after getting scanned (i.e., If RED box is scanned and passed RED LED will glow. Similarly for all colors). And for the final addition we can add a buzzer that will go off every time a color is separated.

Thus we can separate any no. of colors by this process. We just have to add up different motors and drivers and vary some program to get the desired the result.

2. PROCESS

The Scanning and Separation Device is used for separating different coloured boxes over here. So basically we need a power supply for our processes. After that different coloured boxes are passed on the conveyor belt to be scanned and separated according to their colours. The scanning and separation device can be made very easily with previous technologies but here we have used Image Processing to scan and separate the colours. Due to Image Processing the future scope of the device extends to almost limitless. Once the colour is scanned the microcontroller gives command to the push motors resting aside the conveyor belt to slide the different coloured boxes to their respective paths. So with least amount of manpower The Scanning and Separation Device works efficiently giving the best possible results.

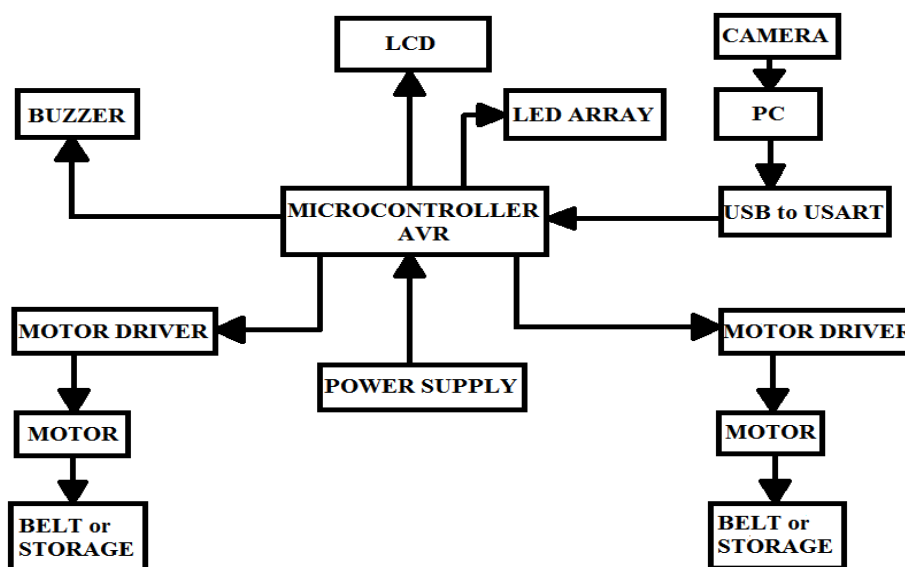The flow of commands is shown in the block diagram below.

Fig.1   Block Diagram of The S.S Device 1

3. CONCLUSION

So from the project of The Scanning and Separation Device we can conclude that with the use of minimum manpower we can accomplish the process of separation efficiently and accurately.

In future we can use this technology and make separation of different labelled books in library automatically, separation of luggage, separation on basis of size/shape/quality, etc.

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