# Automatic color mixing plant

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*Abstract— Detection of desired color and its automated generation can be very useful. Based on its wavelength and other properties a machine could be developed that could utilize the principle of embedded to automatically mix the primary colors viz. red, blue and green (RGB) in required proportions to obtain the similar color as required. The automated system can be further developed to chemical plant which could be useful in chemical industries. This fully automated system will definitely have the following benefits.*

*Improved quality: with an automated system we can expect to create a more reliable, high quality end product. Conserve paint: it can cut down the material cost as it is precise. Save energy: automated system allow for more compact and precise painting which requires less physical effort*

## I. INTRODUCTION

Nowadays the demand for high quality, greater efficiency and automated machines has increased in the industrial sector of different plants. The process control of color making which is the most important process in any color plant like ASIAN paints and its automation is the precise effort. In order to automate a color plant and minimize human intervention, there is a need to develop a system which helps reduce the errors caused by humans.

Automation is also needed at small scale plants like paint shop , coffee shop etc. So instead of using plc for such small scale application we can use microcontroller (AT 89S52) , which will reduce our cost and will save space too.

The project consists of color mixing mechanism using three primary colors that are red, yellow, and blue. The system consists of a microcontroller, keypad, motors, and valves. The user can generate any of the required secondary color. The user can select any of the desired color from the keypad. The color tank valves (RYB) will be opened for the proper duration of time so as to get the required color. Once the required color is generated and taken into the container the user can wash the mixing tank with water or thinner.

Basically in this project user can create any one of the secondary colors by using three primary colors that are red, yellow and blue (RYB). The secondary colors are actually generated by mixing the three primary colors in proper proportion.

## II. LITERATURE REVIEW

Color mixing is an important process which has a wide application in several fields. There are various kinds of color mixing that can be done. It can either be additive color mixing or subtractive color mixing. Additive color is a method to create color by mixing a number of different colors, with shades of red, yellow, and blue being the most common primary colors used in additive color system. subtractive color mixing is exact opposite of additive color mixing it uses orange, green, and violet as most common primary colors.

Generally there are various kinds of paint mixing machines available in the market. They vary in their size, shape, technology and methodologies.

[5]Asian paints uses the tinting machine for proper proportion which is handle through the computer commands. They use Prismapro software which is installed on the computer.

[6]Asian paints uses the separate machines for tinting and mixing. After taking the proper proportions of colors then the container is tighten up with the lid and and set it in the mixing machine.

### III.  PROBLEM STATEMENT

Conventional equipment systems are prone to errors due to the involvement of humans in the data collection and processing using complicated mathematical expressions due to this there is waste of time, money and resources.

The existing color mixing plants has two separate machines , one for getting the proper proportion of the primary colors and another machine to mix the colors. But this method is time consuming and also increases hardware , so we are combining both these machines in a single plant and also a separate water tank to clean the mixing tank.

### IV.    METHODOLOGY

Additive color mixing  is a method to create color by mixing a number of different colors, with shades of red, yellow and blue being the most common primary colors used in additive color system.



Fig 1:Additive mixing of color

We are generating the orange, green and violet color from the RYB primary colors.

So to generate this we have to calculate the proportion of each color and have to set timing for valve.

On trial and error basis we calculate the time for different quantities.

As 50ml color require 10sec to get dispatched from bottle, we calculate time for 5ml=1sec and same for the other quantities.

After calculating timings we open the respective valves for that much required seconds.

 So to generate orange color, we need 50% of red and 50% of yellow.

So if user needs 300ml of orange color then the valve of yellow and blue bottle will be open for 30sec each.

### V.    WORKING

As switch is on, all the initial settings are done by the microcontroller(AT89S52) , such as initializing the LCD routine, relay contacts etc.

LCD displays the message to select the required color, so user can select required color from the keypad interface.

After selecting the color, LCD ask to select the quantity of the color.

Controller opens the valves of respective color for particular duration of time.

The mixing motor mix the color in the mixing tank using stirrer.

After mixing, controller opens the valve of the mixing tank.

Color is taken out in the container, which is below the mixing tank.

If user want another color then  mixing tank must be cleaned because it contains residue of the previous color.

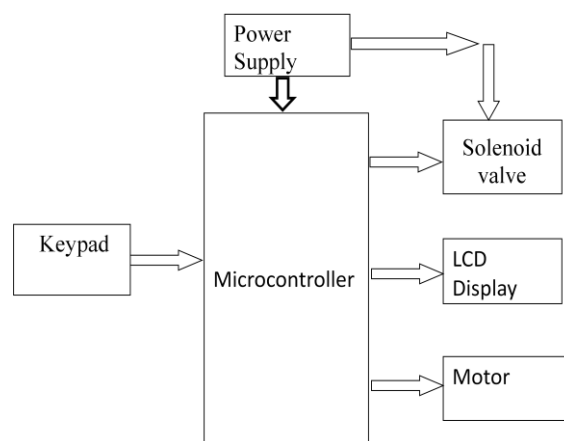So cleaning is provided by means of water.



Fig 2: Block Diagram

Controller opens the valve of the water tank and then it will clean the mixing tank using stirrer and motor.

### VI.     EXPECTED RESULT

- The color proportion of red, yellow, and blue should be in a proper value for a desired color.
- The project should be completed at a very low cost, should be small in size and light in weight.

### VII.     REFERENCES

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