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Automatic Colour Blend for Dyeing Industry Using Android Application

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ABSTRACT: The mixing of dyes is important in many industries such as paint, leather, tanning and textiles. If it is done in improper proportions it would result in vivid shades of color. This makes the product to be different from their customer requirements. The color also depends upon the time and duration it is allowed to rest. The proposed system is a dyeing companion which automatically mixes different dye proportions. It measures the exact quantity of the dye for the required color pattern. The color combination data is converted into Arduino coding with proper time delay. It has easy access for selecting the color from an Android application. It has combination for all the required color patterns and can be easily operated by the user. The sample for each dye proportion is available in the application which helps the user for selecting the appropriate combination. The data of dye combination for the required product color is given as a trigger to the system through Bluetooth serial communication to the Arduino controller. It in turn controls the system with proper time delay for the exact amount of the dye for chosen color. There is a color sensor which checks for the outcome of the mixing of dyes. If the required color parameters are not met with it would be indicated to the user through Android application. This is an accurate model which eradicates the manual errors in dyeing industry. It would also save the chemical resources.

KEYWORDS: Arduino-Nano, Bluetooth module (HC-06), Android application.

I.INTRODUCTION

In today's world color plays a major role. Likewise color mixing is an important process which has a wide application in several fields. They are various types of color mixing that can be done. It can be either additive colour mixing or subtractive color mixing. Additive color blending of shades including blending colors of light. RGB stands for "Red Green Blue". RGB means three hues of light. The three hues of light can mixed together to create a different combination of colors. The RGB Color model is an additive model. In the event that each of the three essential colors is mixed together, the outcome is white. Without shade or when no colors are combined together means, the outcome is black.

At the point when red and green combine together means, the outcome is yellow. At the point when red and blue combine together means, the outcome is maroon. At the point when blue and green combine together means, the outcome is cyan. RGB is essentially opposite to subtractive color model and particularly to CMY color model. The subtractive color mixing is carried out by specifically evacuating certain shades. The three essential colors in subtractive blending are yellow, maroon and cyan.

In subtractive blending of color, the unlucky deficiency of shade is white and the vicinity of every one of the three essential colors is dark. Subtractive blending is utilized to make a mixture of colors when printing on paper by consolidating a little number of ink shades, and additionally when painting.

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In this system we are using Arduino-Nano as controller because it is small, flexible and breadboard friendly microcontroller board. It contains exactly the same functionality as in Arduino-UNO but quite in small size. It comes with an operating voltage of 5v. Relay driver-4 channel helps to boost the three motors. Android application such as THUNKABLE is connected to the Bluetooth HC-06 through serial communication.

In this paper, we are going to discuss on various section as follows. Section II describes about the Literature survey, section III proposed system, section IV gives us a conclusion and section V comprises of the references used.

II. LITERATURE SURVEY

In mixing system they use the Arduino as a controller. It is an open-source electronics prototyping platform based on flexible, easy-to-use hardware and software. To install the MATLAB in offline computer or laptop and develop a programmatically GUI apps with user interface of color selection.

The implementation of the process should provide the user can select one of the twelve colors which are shown on the MATLAB GUI and the serial data are sent to the Arduino via the USB TTL serial interface. The program is pre-written into the Arduino which is programmed according to process. Based on color selection, the pigment flow is controlled by the Arduino through the relay circuit and the mixture of colors will be mixed in the container by mixer motor. In other techniques Various type of mixing can be done, it can be either color mixing or any other liquid mixing.

Color mixing is the process of developing new colors by using the combination of primary colors. It is either done manually or performed on machine with a lot of human effort. We have initiated a programmable logic control PLC based system that gives the desire color by mixing the primary colors with their specific ratios. A user friendly HMI has been designed to make the system more convenient and can be easily operated by a non-technical person. Availability of input colors are mentioned in our system. User can create any color combination with his own ratio of the three basic colors that need to be selected on HMI or user can select pre-defined output colors.

To achieve the required concentration, our system is comprised in close loop that monitor the flow of basic color and the output is verified by industrial color detector sensor.The exact drawbacks of the existing system are requires more manpower and the wastage of product if we do any of some mistakes in the mixing process it will leads to failure of whole process. The extractions of the colour in the mixing of dyes are not set to be accurate. Because of adding of little more extraction of a single colour with the multiple colour. This is the major drawbacks of the existing system

III. PROPOSED SYSTEM

Mixing of dyes in improper proportions it would result in vivid shades of color. This makes the product to be different from their customer requirements. In this proposed color mixing system we use the Arduino as a controller. It is an open –source electronics prototyping platform based on flexible, easy-to-use hardware and software. color mixing is a dyeing companion which automatically mixes different dye proportions. It measures the exact quantity of the dye for the required color pattern. The color combination data is converted into Arduino coding with proper time delay. It has easy access for selecting the color from an Android application. It has combination for all the required color patterns and can be easily operated by the user.

The sample for each dye proportion is available in the application which helps the user for selecting the appropriate combination. The data of dye combination for the required product color is given as a trigger to the system through Bluetooth serial communication to the Arduino controller. It in turn controls the system with proper time delay for the exact amount of the dye for chosen color. There is a color sensor which checks for the outcome of the mixing of dyes. If the required color parameters are not met with it would be indicated to the user through Android application. This is an accurate model which eradicates the manual errors in dyeing industry. It would also save the chemical resources.

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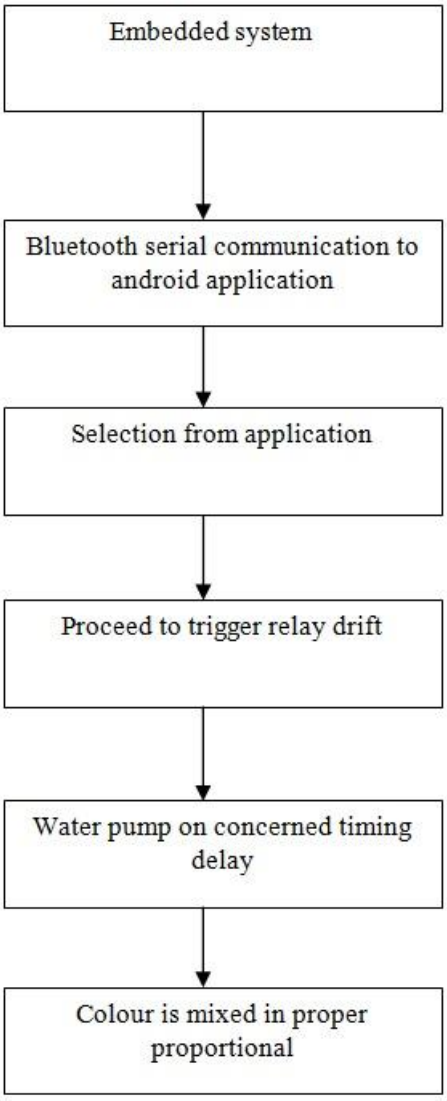
FLOW CHART:



This system consist of Arduino board that are used to control the commands of the circuit board and the command to flow the exact colour paint in the required output paints.

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TABULATION FOR ARDUINO NANO

MICROCONTROLLER	Atmega328p/Atmega168
OPERATING VOLTAGE	5V
INPUT VOLTAGE	7-12V
DIGITAL I\O PINS	14
PWM	6 out of 14 digit pins
MAX.CURRENT RATING	40Ma
USB	Mini
ANALOG PINS	8
FLASH MEMORY	16KB or 32KB
SRAM	1KB or 2KB
CRYSTAL OSCILLATOR	16MHz
EEPROM	512 bytes or 1KB
USART	Yes

IV. FUTURE SCOPE

This system can further used in chemicals, paints and dyes. We can use this system like an ATM machine that the paint can available at anyplace to anyone. We can expand this system by adding collecting money machine and keep them in every paint shop. So anyone can easily make them what they required colour they needed. This system can further used in chemical industry.

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V. CONCLUSION

In most of the developing paints, dye and chemical industries. The process of mixing and manufacturing of the required colour are said to be difficult. This paper presents the exact mixing of colour or chemicals in the efficient way without using more manpower. This is useful to so many industries as a product. It is said to be safe and reliable while used for chemicals. The Android application are programmed to get the work easier. It is useful and cost efficient to all the paint, dye and chemical industries.

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