

Automatic Drink Mixer and Dispenser Machine

Prof. Prajakta Jadhav, Yash Thakur, Kaustubh Thakur, Aman Dev

Department of Electronics and Telecommunication Engineering, Dr. D. Y. Patil School of Engineering,
Lohegaon, Pune, Maharashtra, India

ABSTRACT

In today's fast-moving, competitive industrial world, a company must be flexible, cost effective for its survival. In the manufacturing industries there is great demand for industrial automation systems. The industrial automation is necessary in order to streamline operations in terms of acceleration, reliability and system output. In today's economical world, automation plays gradually important role. This paper aims to develop a system, which can connect the machine to phone with android application using the Bluetooth module. Through this device, we can make different composition of drinks using the liquids in the container. In the available version, the machine is costly and not customizable. The system proposed in this paper is a solution for mixing of drinks in desired composition where recipes for each drink is fed in the application, all one has to do is to select the name of the drink. The technology behind this automation and IOT. The system deals with the connection of phone and the machine. Each dispensing tube has a connected motor (Pump) which is driven by relay. The mixed drink is finally collected in the container at the base. The command from the graphic based android application is sent to the microcontroller of the machine and the device functions accordingly.

Keywords : Raspberry pi 3, Android, Relay, IOT.

I. INTRODUCTION

The brain of Barbot is a configurable Twitchy microcontroller board. The Twitchy, in turn, is based on the Raspberrianjessie platform, a collection of development tools based on open-source hardware designs and software. Pi-based devices interact with the world through attached sensors, controllers, motors, and other actuators. Pi-3 is an ideal robot development environment. Bot has its heart as a Raspberry-pi chip running the python coding environment and optimized to drive actuators and sensors. The control panel is an android-based application. A peristaltic pump uses bearings that, when they turn, put revolving pressure on a tube and force liquids onward, the way you would force toothpaste out of a tube. Peristaltic pumps are commonly used in dialysis machines to transfer blood, because the parts that squeeze the tube never touch

the liquid, thus keeping it from being contaminated. To initiate drink making, you need to select it from the menu of the graphical user interface based application. The phone is connected to the device with the help of Bluetooth technology.

II. METHODS AND MATERIAL

The project is to create a machine which sucks liquid from the stock and makes a drink. The drink is made as per the user's choice. We can have this machine in home, office, parties, schools, etc. The device is connected to phone with the help of Bluetooth and the graphical user interface based application is used to control the device. To make this possible we use Raspberry pi-3 as a brain for the bot with its fast Bluetooth technology we can communicate with the device. The motors or pumps

suck the liquid and using pipes dispensed in the container accordingly.

III. RESULTS AND DISCUSSION

Proposed system has been in different aspects of development in previous various projects. Suction of liquids and mixing using the servo has proven excellent results. The system mentioned in this paper has different approach for sucking and mixing of liquids for the making of a single drink. The Pi works well with the relays and sensors are compatible with the micro-controller. The LCD is also connected to display the outputs of the machine while the drink is being prepared.

PROPOSED SYSTEM ADVANTAGES:

- Automatic mixing of the liquid to be dispensed .
- Preset menu options .
- Liquid heating at some specific temp .
- Liquid stirring with stirrer .
- Cleaning mechanism for the device .

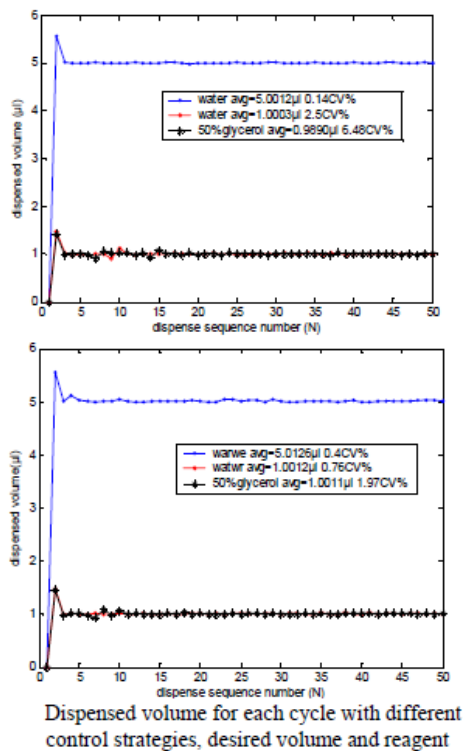


Figure 1

OBJECTIVE OF PROJECT

We aim to create a system that :

1. Automatically dispense the selected drink
2. Smart system that has preset menu options
3. To Stir the drink automatically
4. Providing cleaning functionality
5. Liquid heating facility
6. Adequate mixing

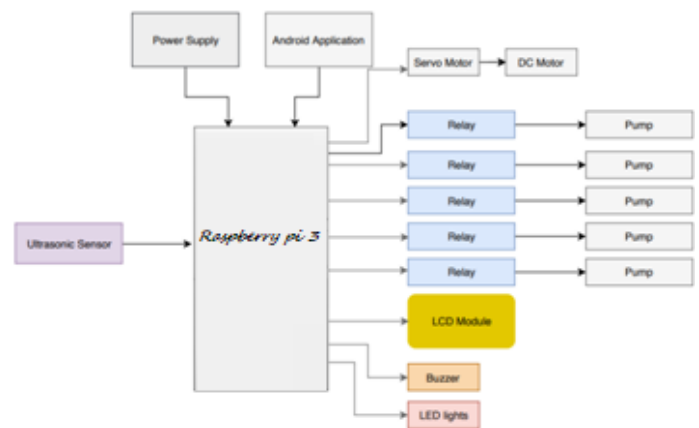


Figure 2

Figure 2 : Shows block diagram of Automatic liquid dispenser and mixer. The basic requirements of the controller (Raspberry pi-3) are 5V , 2Amp power supply and an android application for driving it remotely or wirelessly. It has internal voltage regulators and GPIO pins for different outputs and inputs. The input given to the controller is the signal through Android application Bluetooth Terminal. We shall have 'n' number of inputs through the application. The communication with the Raspberry is via Bluetooth protocol. The frequency in which Bluetooth works is 2.4Ghz using a HC-05 Module. To activate the dc motor 5vV/500mA is required. The controller provides (5v/2A) which is sufficient to drive the motor. The dc motor is basically a peristaltic pump which intend suck liquid from the containers kept inside the machine, for making different combinations we drive more than one motor in a single call .Every operation is of time. The amount

dispensed will be on the time period fixed in the program itself. The empty containers will give a notification that certain container is empty needs to be refilled. The Bluetooth module enhances the feature of having the drinks ready without touching the module, if possible in the range of Bluetooth can be accessed remotely.

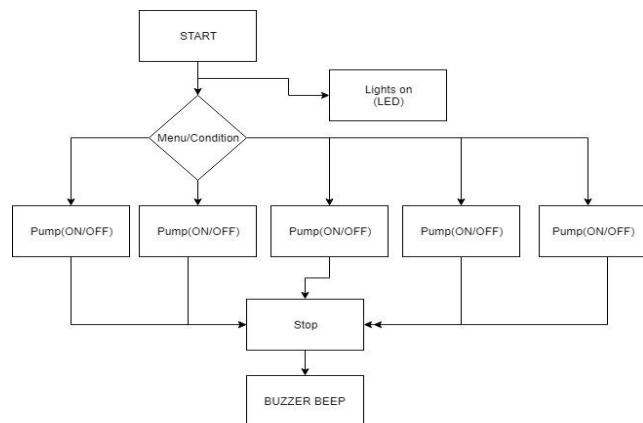


Figure 3 : Flow Chart

Advantages

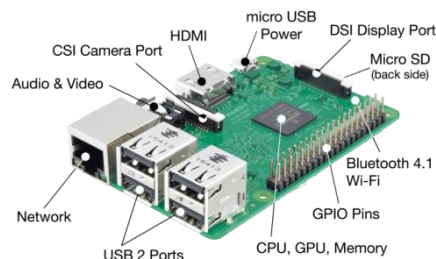
1. Obtain the best mixture proportion, hence taste is retained
2. Cleaning of tubes after each drink, no persisting aftertaste.
3. Personalized service, as custom drinks can be made using the custom menu.
4. Low power consumption.

Implementation



IV. SYSTEM ARCHITECTURE

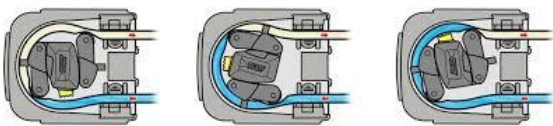
The Raspberry Pi is a series of small single-board computers developed in the United Kingdom by the Raspberry Pi Foundation to promote teaching of basic computer science in schools and in developing countries. The original model became far more popular than anticipated, selling outside its target market for uses such as robotics. All models feature a Broadcom system on a chip (SoC) with an integrated ARM-compatible central processing unit (CPU) and on-chip graphics processing unit (GPU). Processor speed ranges from 700 MHz to 1.4 GHz for the Pi 3 Model B+ on-board memory ranges from 256 MB to 1 GB RAM. Secure Digital (SD) cards are used to store the operating system and program memory in either SDHC (early Raspberry Pi's) or Micro-SDHC (Later Raspberry Pi's) sizes.



Peristaltic Pumps

A peristaltic pump is a type of positive displacement pump used for pumping a variety of fluids, they are also commonly known as roller pumps. The fluid is contained within a flexible tube fitted inside a circular pump casing (though linear peristaltic pumps have been made). A rotor with a number of "rollers", "shoes", "wipers", or "lobes" attached to the external circumference of the rotor compresses the flexible tube. As the rotor turns, the part of the tube under compression is pinched closed (or "occludes") thus forcing the fluid to be pumped to move through the tube. Additionally, as the tube opens to its natural state after the passing of the cam ("restitution" or "resilience") fluid flow is induced to the pump. This

process is called peristalsis and is used in many biological systems such as the gastrointestinal tract. Typically, there will be two or more rollers, or wipers, occluding the tube, trapping between them a body of fluid. The body of fluid is then transported, at ambient pressure, toward the pump outlet. Peristaltic pumps may run continuously, or they may be indexed through partial revolutions to deliver smaller amounts of fluid.



Relay

A relay is an electrically operated switch. Many relays use an electromagnet to mechanically operate a switch, but other operating principles are also used, such as solid-state relays. Relays are used where it is necessary to control a circuit by a separate low-power signal, or where several circuits must be controlled by one signal. The first relays were used in long distance telegraph circuits as amplifiers: they repeated the signal coming in from one circuit and re-transmitted it on another circuit. Relays were used extensively in telephone exchanges and early computers to perform logical operations.



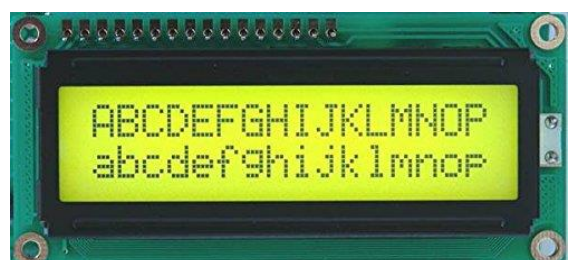
LCD

A liquid-crystal display (LCD) is a flat-panel display or other electronically modulated optical device that uses the light-modulating properties of liquid crystals. Liquid crystals do not emit light directly, instead using a backlight or reflector to produce images in color or

monochrome.[1] LCDs are available to display arbitrary images (as in a general-purpose computer display) or fixed images with low information content, which can be displayed or hidden, such as preset words, digits, and seven-segment displays, as in a digital clock. They use the same basic technology, except that arbitrary images are made up of a large number of small pixels, while other displays have larger elements. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits. These modules are preferred over seven segments and other multi segment LEDs. The reasons being: LCDs are economical; easily programmable; have no limitation of displaying special & even custom characters (unlike in seven segments), animations and so on. 16x2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix. This LCD has two registers, namely, Command and Data. The command register stores the command instructions given to the LCD. A command is an instruction given to LCD to do a predefined task like initializing it, clearing its screen, setting the cursor position, controlling display etc. The data register stores the data to be displayed on the LCD. The data is the ASCII value of the character to be displayed on the LCD.

V. CONCLUSION

The proposed system will be able suck liquid from containers at the base. The drinks will be made according to the menu in the application. No error is generated while connecting the device with the phone using Bluetooth technology. This makes easy to make drink, dispense and stir without any manual operation just have to enjoy your drink.



VI. REFERENCES

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