**Microcontroller based Beverage Dispenser**

**(The µBar)**

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**Abstract**

The Microcontroller based Beverage Dispenser, also known as The µBar, is an automated beverage dispenser that creates beverages based on user selection. The µBar can be used as an in-home appliance or expanded to a larger market such as restaurants and bars. The beverage can be selected via a touchscreen application on the machine or wirelessly through the consumer’s smartphone or tablet. The µBar is intended to entertain as well as save the user money.

**Design**

The main control of the system will be implemented using hardware such as a PIC32, Raspberry Pi, or embedded PC. The controller will provide the instructions needed to power DC motors, servo motors, pumps, etc. Depending on the hardware chosen, the main programming language will most likely be C++ and Java. C++ would be used to code the controllers; while Java would be used to implement a wireless communication system through the consumers’ Android based smartphones or tablets. For in-home use this can also be implemented using Bluetooth.

There are currently two different mechanical design concepts for The µBar:

1. A gear driven mechanism that transfers the cup underneath the required bottles of liquids needed to create the beverage. A main station for basic and often used ingredients will be grouped together at one end. The ingredients would be poured based on the exact amount (in ml) using pumps (pump type still in question).
2. A non-mobile system where the user places a cup in a single location and all the tubing is combined into one dispensing location.

The type of motors, actuators, and pumps are still being researched. However, in order to pour the correct amount needed, we will be using a timing based scale. Depending on the type of liquid and its viscosity, the amount of time it takes to pour a certain amount of milliliters will differ. Therefore, the software loaded will change in respect to what is needed.

The wireless aspect of this project will entail a Bluetooth module that will communicate with some kind of tablet or smartphone, preferably with an Android based operating system. We will build an application that will control the machine as well as send information to the user. The information sent will consist of such parameters as quantity of beverages left, if an operation is being done, temperatures, and notifications of any errors or low product. Other options will be added on as the project progresses.

**Conclusion**

The main purpose of The µBar is to allow users who have no experience in creating mixed beverages a chance to impress their guests as well as give them a fun new way to enjoy their drinks. The µBar can be used for in-home entertaining as well as large restaurants. Imagine having dinner at your local diner and your drink is running low. All you will have to do tap a few pictures on the tablet located at your table and The µBar will mix syrups and carbonated water to create your perfect soda. The µBar is also a money saving tool. Many times drinks are made and then thrown away due to the overbearing flavor or lack thereof. With The µBar the perfect beverage can be made consistently the way the consumer likes, allowing them to dispose very little and use every bit they paid for. The µBar is a versatile system that can be used in all types of environments.

**Block Diagram**

The µBar

Beverage

Library

Done Indicator

Controller

Beverage Level

Indicator

Move Gear Motors

Send Position

Coordinates

Send Drink Data

(Amount)

User Input