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BEVERAGE DISPENSER

FIELD OF INVENTION

The present invention relates to a beverage brewing dispenser, more particularly a dispenser which produces hot freshly brewed beverages mixed with flavor ingredients, filled with air bubbles and with a foamy topping. The dispenser initially brews tea or coffee to produce a freshly brewed liquid concentrate, which is then stored in a container. Next, the beverage is made by reheating the liquid concentrate and then whipping the reheated freshly brewed concentrate with hot water and flavor ingredients.

BACKGROUND OF THE INVENTION

Drinking freshly brewed coffee or tea is a way of people enjoying life. But due to busy lifestyle, people prefer to consume canned or packed beverages rather than freshly brewed beverages as brewing takes time and also requires skills to prepare a cup of quality beverage.

Traditionally, coffee or tea is brewed in a brew basket and drips into a decanter. To keep the beverage warm, the decanter is placed on top of a hot plate. Unlike coffee, freshly brewed tea cannot be heated for too long as it gets musty; therefore, freshly brewed tea dispensers available today are only used to dispense iced-tea. Moreover, freshly brewed beverage dispensers currently available only dispense beverages in their original flavor. Other flavors, such as, sugar or creamer must then be added by the consumers according to their preference.

In addition, the brew baskets presently used have only one compartment for storing the coffee or tea. This is not convenient as the user has to detach and attach the brew basket to replace new coffee or tea for every single brewing.

Other types of beverage dispensers which are available in the market dispense hot flavored coffee or tea by using post-mixed ingredients instead of freshly brewed beverages. The ratio

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of the constituents for a post-mixed ingredient is pre-determined by the manufacturers of the dispensers.

Thus, there is a need for a system or apparatus that can solve the above mentioned problems in preparing a freshly brewed beverage, and provide an automatic beverage brewing dispenser which can efficiently produce a hot freshly brewed beverage mixed with flavor ingredients.

It is an object of the present invention to provide a dispenser that initially brews any brewable substance such as, but not limited to coffee or tea, to obtain freshly brewed liquid concentrate, and then store the liquid concentrate in a container.

It is another object of the present invention to provide a dispenser with a heat transfer mechanism to reheat cool freshly brewed liquid concentrate in a high speed manner when a beverage is desired.

It is also another object of the present invention to provide a hot freshly brewed beverage filled with air bubbles and with a foamy topping.

It is still another object of the present invention to provide a brew basket with a plurality of compartments to eliminate the need to replace a new beverage bag for every single brewing.

It is a further object of the present invention to provide a dispenser that can communicate wirelessly with its service center for timely material order or maintenance or reprogramming.

It is an additional object of the present invention to provide a dispenser that allows the water tank in its dispenser to be shared with other adjacent dispensers.

These and other objects of the invention will become apparent to one of the ordinary skill in the art after reading the disclosure of the invention.

SUMMARY OF THE INVENTION

The present invention thus describes a beverage dispenser for dispensing a variety of freshly brewed hot beverages mixed with flavor ingredients, filled with air bubbles and with a foamy topping.

A water tank, installed with a temperature sensor and several water level sensors, is used to store and heat water. The hot water from the water tank, which is transported to a sprayhead by a water pump, is sprayed onto a beverage bag of brewable substance to brew the brewable substance and hence produce a freshly brewed liquid concentrate. The beverage bag is placed inside a detachable multi-compartment brew basket located below the sprayhead.

The freshly brewed liquid concentrate infused from the brewable substance is collected and stored in a container at room temperature. When a beverage is desired, a pump transports the cool freshly brewed liquid concentrate from the container to flow through a heat exchanger, which is immersed in the hot water inside the water tank, to transfer heat from the hot water to the cool freshly brewed liquid concentrate. Consequently, the freshly brewed liquid concentrate is reheated in a high speed manner. A propelling blade inside a mixer and whipper then mixes and whips the reheated freshly brewed liquid concentrate with flavor ingredients and hot water from the water tank to produce a hot freshly brewed beverage mixed with flavor ingredients, filled with air bubbles and with a foamy topping.

Another preferred embodiment for this dispenser is the multi-compartment brew basket. Each compartment of the brew basket stores one beverage bag of coffee or tea for each new brewing process. Therefore, the multi-compartment brew basket eliminates the need to replace a new beverage bag for every single brewing.

Another preferred embodiment for this dispenser is the built-in wireless modem for wireless

communication between the beverage dispenser and its service center for timely material supply or maintenance. Various control operations of the beverage dispenser can also be reprogrammed via the wireless modem.

Another preferred embodiment for this dispenser is the extension valve in the water tank. The valve is controlled by a control system of the dispenser allowing water to flow from its water tank to other adjacent dispensers.

The present invention consists of certain novel features and a combination of parts hereinafter fully described and illustrated in the accompanying drawings and particularly pointed out in the appended claims; it is understood that various changes in the details may be done without departing from the scope of the invention or sacrificing any of the advantages of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

For the purpose of facilitating a better understanding of the invention, the accompanying drawings illustrate the preferred embodiments in connection with the following description, the invention, its construction and operation so that many of its advantages could be readily understood and appreciated.

Figure 1 is an exploded view showing the various mechanisms that make up the present beverage dispenser of the present invention. The arrows denote the flow of fluids within the dispenser for making a beverage.

Figure 2 shows an exploded rear perspective view of the water tank of the present invention.

Figure 3 shows an exploded front perspective view of the container used for storing freshly brewed liquid concentrate of the present invention.

Figure 4 is a perspective view of the multi-compartment brew basket of the present invention.

Figure 5 is an overall front perspective view of the beverage dispenser with frames and a door of the present invention.

Figure 6 is an exploded front perspective view of the main frame, casing, door and control system housing of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

Referring now to the drawings, in which like numerals refer to like elements throughout the several views.

Figure 1 shows various mechanisms of a beverage dispenser of the present invention to produce a hot freshly brewed beverage mixed with flavor ingredients, filled with air bubbles and with a foamy topping. The arrows denote the flow of water from source, hot water from the water tank, the freshly brewed liquid concentrate, and the flavor ingredients within the beverage dispenser.

A water tank **101**, is used to store and heat water. A heater element **104** is positioned at the bottom within the water tank **101**. The source of water may be from filtered tap water or any tasteless potable water. The water supply from the source to the water tank **101** is controlled by a solenoid inlet-valve **102**. The heater element **104** heats water in the water tank **101** to a temperature between about 85 degrees Celsius and about 100 degrees Celsius. A water pump **103** transports the hot water from the water tank **101** to a sprayhead **112** through a silicon tubing means **170**. The sprayhead **112** sprays the hot water onto the brewable substance placed inside an individual compartment of a multi-compartment brew basket **113**. The brewable substance can be, but is not limited to, coffee or tea. The hot water, passing through the brew basket **113** of the brewable substance, brews the brewable substance to produce a

freshly brewed liquid concentrate.

The brewable substance is preferably packed inside a disposable water-resistant filter paper so that it can be replaced and discarded conveniently.

During brewing, drips of the freshly brewed liquid concentrate from the multi-compartment brew basket **113** are collected and stored in a container **110**. In order to preserve the flavor of the freshly brewed liquid concentrate, the freshly brewed liquid concentrate is stored at room temperature or cooled with a refrigeration system. However when a beverage is desired, the cool freshly brewed liquid concentrate has to be reheated so that the beverage is hot enough when dispensed in a high-speed manner. A pump **138** transports the cool freshly brewed liquid concentrate from the container **110** to flow through a heat exchanger **108** via a silicon tubing means **171**. The heat exchanger **108** is immersed in the hot water in the water tank **101** to quickly transfer heat from the hot water in the water tank **101** to the cool freshly brewed liquid concentrate so that the beverage has a temperature of more than about 60 degrees Celsius when dispensed.

After passing through the heat exchanger **108** immersed in the hot water in water tank **101**, the reheated freshly brewed liquid concentrate is collected in a mixer and whipper **116** through a silicon tubing means **172**. A source of liquid flavor ingredients **117** is also transported to the mixer and whipper **116** by a roller pump **115**. The roller pump **115** is used to transport the high viscosity liquid of flavor ingredients **117**. The liquid flavor ingredients **117** can include one of the following items, but are not limited to, Condensed Sweetened Milk, Condensed Sweetened Creamer, Condensed Filled Milk, Condensed Filled Creamer or sugar syrup. Simultaneously, a pump **114** transports the hot water from the water tank **101** through a silicon tubing means **173** into the mixer and whipper **116** to form a mixture consisting of the reheated freshly brewed liquid concentrate from the heat exchanger **108**, the flavor ingredients **117** and the hot water from the water tank **101**. The mixture is then whipped by a propelling blade adapted inside the mixer and whipper **116** to produce an evenly mixed hot beverage filled with air bubbles and with a foamy topping.

In another preferred embodiment, the operations of the dispenser are controlled by a control

system comprising a printed circuit board, electronic components, electrical components and a microcontroller. In order for the beverage dispenser to perform properly, the heater element **104**, the water inlet-valve **102**, the water pump **103**, the water pump **114**, the liquid concentrate pump **138**, the roller pump **115** and a propelling blade adapted within the mixer and whipper **116** are all actuated by the control system. The amount of the hot water, the reheated freshly brewed liquid concentrate and the flavor ingredients for producing a beverage are also controlled by the programs embedded in the control system.

Figure 2 shows an exploded rear perspective view of the water tank **101** used for storing and heating potable water. Water from the water source enters the water tank **101** through the water inlet-valve **102** connected to the water tank **101** via a tubing means **129**. The water inlet-valve **102** is actuated by the control system. A heat exchanger **108** for reheating the freshly brewed liquid concentrate and a heater element **104** to heat the water are also installed inside the water tank.

A lid **109** covers the water tank **101** in order to prevent heat from the hot water inside the water tank **101** from dissipating into the atmosphere and to prevent the hot water from spilling. The water tank **101** has a dump-hole **128** to release excess water and the vapor from the hot water. Rear-hooks **125** and side-hooks **126** are mounted on the walls of the water tank **101** to secure the water tank **101** to a mainframe **140** of **Figure 6**.

The heat exchanger **108** will hereinafter be described in further detail. The upper end of the heat exchanger **108** is connected to a heat exchanger inlet-socket **118**, which is already built-in the wall of the water tank **101**, with a detachable silicon tubing connector **119** for easy installation and maintenance. The bottom end of the heat exchanger **108** is connected to a heat exchanger outlet-socket **120**, which is already built-in the wall of the water tank **101**, with a detachable silicon tubing connector **119**. The heat exchanger inlet-socket **118** is connected to the liquid concentrate pump **138** of **Figure 1** with the silicon tubing means **171** of **Figure 1**, while the heat exchanger outlet-socket **120** is connected to the mixer and whipper **116** of **Figure 1** or **Figure 5** with the silicon tubing means **172** of **Figure 1**. When a beverage is desired, the liquid concentrate pump **138** of **Figure 1** or **Figure 3** transports the cool freshly brewed liquid concentrate from the container **110** to flow through the heat exchanger **108**, which is immersed in the hot water inside the water tank **101**, in order to

quickly transfer heat from the hot water inside the water tank **101** to the cool freshly brewed liquid concentrate. The heat exchanger **108** is preferably made of a non-corrosive and high heat induction material such as, but not limited to copper tubing.

A plurality of sensors is installed in the water tank **101**, such as a temperature sensor **106** and a plurality of water sensors **121, 122, 123, 124**. All the sensors are in communication with the control system. If the temperature sensor **106** indicates the temperature of the water inside the water tank **101** falls below about 85 degrees Celsius, then the control system will activate the heater elements **104** to heat the water inside the water tank **101**. On the other hand, if the temperature sensor **106** indicates that the temperature of the water inside the water tank **101** has reached about 100 degrees Celsius, then the control system will deactivate the heater element **104**.

The different levels of water sensors **121, 122, 123, 124** installed in the water tank **101** are used to detect the different levels of hot water inside the water tank **101**. If the low water level sensor **123** indicates that the level of hot water inside the water tank **101** has fallen below the heater element **104**, then the control system will not activate the heater element **104** regardless of the temperature of the water inside the water tank **101** to prevent the heater element **104** from overheating. If the high water level sensor **121** indicates that the level of hot water inside the water tank **101** has reached the highest limit of the water tank **101**, then the control system will actuate the water inlet-valve **102** to close for preventing the water tank **101** from overfilling. Another water level sensor **122** indicates that the level of hot water inside the water tank **101** is sufficient for brewing. If the hot water level inside the water tank **101** falls below the water level sensor **122**, then the control system will stop transporting the hot water to the sprayhead **112** of **Figure 1** or **Figure 5** for brewing although the container **110** of **Figure 1** or **Figure 3** has run out of the freshly brewed liquid concentrate. Simultaneously, the control system actuates the water inlet-valve **102** to open to allow water from the source to flow into the water tank **101**. The empty tank sensor **124** indicates the water tank **101** is dry and ready for maintenance.

A plurality of silicon grommets **107** is used for securing the temperature sensor **106** and the plurality of water sensors **121, 122, 123, 124** to the lid **109** of the water tank **101**.

At least two water pumps **103** and **114** are attached to the water tank **101**. The water pump **103** transports the hot water from the water tank **101** to the sprayhead **112** of **Figure 1** or **Figure 5** through the silicon tubing means **170** of **Figure 1**, while the water pump **114** transports the hot water from the water tank **101** to the mixer and whipper **116** of **Figure 1** or **Figure 5** through the silicon tubing means **173** of **Figure 1**.

During maintenance, a dump-valve **132** attached at the bottom of the water tank **101** discards the water inside the water tank **101**.

Insulated material wraps around the water tank **101** to prevent heat dissipation from the hot water inside the water tank **101** to the beverage dispenser or the atmosphere.

In another preferred embodiment, the water tank **101** also comprises an extension valve **130** to allow the hot water from the water tank **101** to flow to other adjacent dispensers so that the adjacent dispensers do not need to have their own water tank to save cost of fabrication and electricity.

Figure 3 shows an exploded front perspective view of the container **110**. The container **110** is used to store the freshly brewed liquid concentrate. At the top of the container **110** is a lid **136** with an opening to receive drips of the freshly brewed liquid concentrate from the multi-compartment brew basket **113** of **Figure 1** or **Figure 4** or **Figure 5**. At each side of an outlet-socket **137**, which is attached at the bottom of the container **110**, is a concentrate pump **138** and a concentrate dump-valve **139**.

When a beverage is required, the concentrate pump **138** transports the cool freshly brewed liquid concentrate from the container **110** to the heat exchanger inlet-socket **118** of **Figure 2** through the silicon tubing means **171** of **Figure 1** so that the cool freshly brewed liquid concentrate can flow through the heat exchanger **108** of **Figure 1** or **Figure 2**, which is immersed in the hot water inside the water tank **101**, to be reheated.

The liquid concentrate dump-valve **139** is used to discard the freshly brewed liquid

concentrate from the container **110** when the freshly brewed liquid concentrate exceeds storage time or at the end of the day or during maintenance. Both the liquid concentrate pump **138** and the liquid concentrate dump-valve **139** are activated by the control system of the dispenser. Side-hooks **126** are mounted on the walls of the container **110** to secure container **110** to a mainframe **140** of **Figure 6**.

A plurality of liquid level sensors **133, 134, 135** is installed in the container **110** to detect levels of the freshly brewed liquid concentrate inside the container **110** and to determine when the brewing process should take place. If the freshly brewed liquid concentrate in the container **110** falls below the low level sensor **134**, then the control system will execute the brewing process. On the other hand, if the liquid concentrate in the container **110** reaches the highest level sensor **133**, then the control system will stop the brewing process. The lowest level sensor **135** indicates that the expired freshly brewed liquid concentrate is well discarded from the container **110**.

A plurality of silicon grommets **107** is used to secure the plurality of liquid level sensors **133, 134, 135** to the lid **136,** which is tightened at the top of the container **110**.

Figure 4 shows a top perspective view of the brew basket **113**. A plurality of partitions **201** is located within the brew basket **113** to make up a plurality of compartments for the brew basket **113**. Each compartment of the brew basket **113** stores a beverage bag of brewable substance which can be, but is not limited to, coffee or tea. As each brewing process needs a new beverage bag of brewable substance, the brew basket **113** comprising a plurality of compartments storing a plurality of the beverage bags makes the dispenser more convenient to use by eliminating the need to replace a new beverage bag for every single brewing.

Above each compartment of the brew basket **113** is an opening to receive hot water from the sprayhead **112** of **Figure 1** or **Figure 5**. The hot water flows through the compartment of the brew basket **113**, which stores a beverage bag, to brew the brewable substance and hence produce a freshly brewed liquid concentrate. The freshly brewed liquid concentrate, which drips through at least one hole **202** at the base of the brew basket **113,** is collected and stored in the container **110** of **Figure 1** or **Figure 3**.

A plurality of sprayheads **112 of Figure 1** or **Figure 5** is positioned above the plurality of compartments of the brew basket **113** in corresponding with each other. Therefore, the number of compartments of the brew basket **113** corresponds to the number of the sprayheads **112** of **Figure 1** or **Figure 5**.

A plurality of fins **204** at the base of the brew basket **113** is used to lift the beverage bag so that the hot water from sprayhead **112** of **Figure 1** or **Figure 5** can flow through the beverage bag thoroughly. The base of the brew basket **113** slopes down toward the hole **202** so that the freshly brewed liquid concentrate flows and accumulates at the opening of hole **202**.

At the wall **205** of the brew basket **113** is a flange **203** for attaching the brew basket **113** to the beverage dispenser and a handle **206** so that the user can hold the brew basket with ease.

The multi-compartment brew basket **113** is preferably made of, but is not limited to food grade plastic or stainless steel. If the multi-compartment brew basket **113** is made of stainless steel, then the handle **206** is preferably made of non heat conductor material such as, but not limited to plastic or wood.

Figure 5 shows an overall view of the beverage dispenser. All the components that perform various tasks mentioned above are housed inside a mainframe **140**. At the front of the dispenser, a door **141** is hinged to the mainframe **140** at one side. The door **141** comprises a selection panel with multiple buttons **152** to provide various options for the operator; and a display panel **151** to show the status of the dispenser. The display panel **151** may be a Liquid Crystal Display (LCD).

Inside the mainframe **140**, a plurality of sprayheads **112** is secured at a sprayhead holder **149**, which is positioned above a plurality of detachable multi-compartment brew baskets **113**. A plurality of containers **110** is hooked and secured to the mainframe **140** by a plurality of side-hooks **126** of **Figure 3**. The plurality of containers **110** is positioned underneath the plurality of the multi-compartment brew basket **113** to receive and store the freshly brewed liquid concentrate drips from the plurality of multi-compartment brew baskets **113**.

Inside the mainframe **140**, a plurality of roller pumps **115** is secured to a roller pump holder **147** which is positioned near a plurality of the flavor ingredients **117**. When a beverage is required, the roller pump **115** transports the high viscosity liquid flavor ingredients **117** to the mixer and whipper **116** through a silicon tubing means **174** of **Figure 1**. The mixer and whipper **116** have a plurality of inlets, so that when a beverage is required, the reheated freshly brewed liquid concentrate, the liquid flavor ingredients **117**, and the hot water can be transported to the mixer and whipper **116** simultaneously to form a mixture. Inside the mixer and whipper **116** is a propelling blade to whip the mixture in order to create air bubbles inside the mixture.

The flavor ingredients **117** are preferably packed in a disposable bag-in-box package comprising a plastic bag or a plastic bag with aluminium lining inside a corrugated box. The bag has a fitting to which a tube can be attached. The tube is connected to the roller pump **115**, so that the flavor ingredients **117** can be transported to the mixer and whipper **116** upon demand.

A plurality of mixers and whippers **116** is mounted at the internal front-wall **150** of the dispenser. A cup **160** is placed right underneath the mixer and whipper **116** to receive a ready-to-drink hot freshly brewed beverage dispensed from the mixer and whipper **116**. The dispensed beverage is a hot freshly brewed beverage mixed with flavor ingredients, filled with air bubbles and with a foamy topping.

A drip-tray **142** is placed underneath the dispenser to collect the remaining drips or the overflow of the beverage after dispensing.

Figure 6 shows an exploded overview of the mainframe **140**. The mainframe **140** is the main part whereby all the mechanisms of the dispenser are built upon. The door **141** is hinged at one side of the mainframe **140** and can be opened for refilling the bag-in-box flavor ingredients **117** of **Figure 1** or **Figure 5** or for maintenance. An ingredient-shelf **148** having multiple dividers is used for storing a plurality of bag-in-box of the liquid flavor ingredients **117** of **Figure 1** or **Figure 5**.

A roller-pump-holder **147** is used to hold a plurality of roller pumps **115** of **Figure 1** or **Figure 5** in place and is positioned near the plurality of bag-in-box of the flavor ingredients **117** of **Figure 1**or **Figure 5.**

An internal front-wall **150** is used to hold a plurality of mixers and whippers **116** of **Figure 1** or **Figure 5.**

A sprayhead holder **149** is used to secure a plurality of sprayheads **112** of **Figure 1** or **Figure 5** at a position above a plurality of multi-compartment brew baskets **113** of **Figure 1** or **Figure 4** or **Figure 5.**

The control system, consisting of multiple electronic components, multiple electrical components and a microcontroller, controls all of the above-mentioned operations of the beverage dispenser. The control system is adapted inside a waterproof controller-housing **144** and is covered with a controller-housing-cover **145.** Sequences for the dispenser to operate are preprogrammed and are embedded within the microcontroller in the control system. The controller-housing **144,** covered with the controller-housing-cover **145,** is mounted on one side of the mainframe **140.** Multiple electrical wirings are used by the control system to actuate all the motors embedded with the water pump **103** of **Figure 1** or **Figure 2,** the water pump **114** of **Figure 1** or **Figure 2,** the roller pump **115** of **Figure 1** or **Figure 5,** the concentrate pump **138** of **Figure 1** or **Figure 3** and the mixer and whipper **116** of **Figure 1** or **Figure 5.** Multiple electrical wirings are used by the control system to actuate solenoids embedded with the water inlet valve **102** of **Figure 1** or **Figure 2,** the dump valve **132** of **Figure 2,** the extension valve **130** of **Figure 2** and the concentrate dump valve **139** of **Figure 3.** The control system is preprogrammed so that the dispenser can perform in a proper manner according to the information gathered from all the sensors **106, 121, 122, 123, 124, 133, 134, 135** of **Figure 2** or **Figure 3.**

A plurality of foldable-legs **146** is attached at the bottom of the mainframe **140** to save space during transportation.

A casing **143** is used to cover the overall mechanism and interior parts of the dispenser built upon the mainframe **140**.

In another preferred embodiment, the control system of the dispenser is further equipped with a wireless modem for wireless communication between the dispenser and its service center for timely material supply or maintenance. Various control operations of the dispenser can also be reprogrammed wirelessly via the wireless modem.

While in the foregoing specification this invention has been described in relation to certain preferred embodiments thereof and many details have been set forth for purpose of illustration, it will be apparent to those skilled in the art that the invention is susceptible to additional embodiments and that certain of the details described herein can vary considerably without departing from the basic principles of the invention.

CLAIMS:

1. A hot beverage dispenser comprising:
   a water tank;
   a sprayhead in fluid communication with the water tank;
   a brew basket receiving hot water from the sprayhead;
   a container receiving fluid from the brew basket;
   a heat exchanger in fluid communication with the container;
   a source of flavor ingredients;
   a mixer and whipper having fluid communication with the water tank, the heat exchanger and the source of flavor ingredients; and
   a control system for activating the dispenser.

2. A beverage dispenser of claim 1, wherein said water tank comprises a solenoid inlet valve in communication with a water source.

3. The beverage dispenser of claim 1, wherein said water tank comprises a heater element for heating water inside said water tank.

4. The beverage dispenser of claim 1, wherein said water tank comprises a temperature sensor and a plurality of water level sensors in communication with said control system.

5. The beverage dispenser of claim 1, wherein said water tank comprises a plurality of water pumps.

6. The beverage dispenser of claim 3 or 5, wherein said a plurality of water pumps transports hot water from said water tank to said sprayhead, and to said mixer and whipper.

7. The beverage dispenser of claim 1 or 3, wherein said water tank comprises an extension valve for sharing hot water from said water tank to adjacent dispensers.

8. The beverage dispenser of claim 1 or 3, wherein said water tank comprises a solenoid dump valve to discard water from said water tank.

9. The beverage dispenser of claim 1, wherein said brew basket comprises a plurality of partitions to make up a plurality of compartments, wherein each said compartment stores a brewable substance.

10. The beverage dispenser of claim 9, wherein said brewable substances are coffee or tea.

11. The beverage dispenser of claim 3 or 9 or 10, wherein said sprayhead sprays said hot water from said water tank onto said brewable substances placed inside said compartment to brew said brewable substance and hence produce freshly brewed liquid concentrate.

12. The beverage dispenser of claim 1 or 3, wherein said heat exchanger is immersed in said hot water inside said water tank.

13. The beverage dispenser of claim 1 or 9 or 11, wherein said container receives and stores freshly brewed liquid concentrate drips from said brew basket.

14. The beverage dispenser of claim 1 or 11 or 13, wherein said container comprises a pump for transporting said freshly brewed liquid concentrate to said heat exchanger for reheating said freshly brewed liquid concentrate.

15. The beverage dispenser of claim 1 or 11 or 13, wherein said container comprises of a solenoid dump valve to discard expired said freshly brewed liquid concentrate.

16. The beverage dispenser of claim 1, wherein said container comprises a plurality of liquid level sensors having communication with said control system.

17. The beverage dispenser of claim 1, wherein said source of flavor ingredients has fluid communication with said mixer and whipper.

18. The beverage dispenser of claim 1, further comprising a roller pump transporting fluids from said source of flavor ingredients to said mixer and whipper.

19. The beverage dispenser of claim 18, wherein said roller pump has a peristaltic mechanism.

20. The beverage dispenser of claim 1 or 3 or 11, wherein said mixer and whipper comprises a plurality of inlets for receiving reheated said freshly brewed liquid concentrate, said flavor ingredients, said hot water simultaneously, and air from the atmosphere to form a mixture.

21. The beverage dispenser of claim 1 or 20, wherein said mixer and whipper comprises a propelling blade to mix and whip said mixture to create air bubbles in said mixture.

22. The beverage dispenser of claim 21, wherein said mixture with air bubbles is dispensed as a hot freshly brewed beverage mixed with flavor ingredients, filled with air bubbles and with a foamy topping.

23. The beverage dispenser of claim 1, wherein said control system comprises a printed circuit board, a plurality of electronics components, a plurality of electrical components, and a microcontroller.

24. The beverage dispenser of any one of claims 1, 2, 3, 4, 5, 7, 8, 14, 15, or 16, wherein said control system activates said inlet valve, said heater element, said water pumps, said extension valve, said dump valve, said pump, said container dump valve, and said mixer and whipper; in addition to being in communication with said temperature sensor, and all said water level sensors at said water tank and said liquid level sensors and said container.

25. The beverage dispenser of claim 1, wherein said control system has a wireless modem to communicate wirelessly with service center of said beverage dispenser for timely raw material supply or service or reprogramming of said beverage dispenser.

26. The beverage dispenser of claim 1, further comprises a display panel showing status of said beverage dispenser; and multiple selection buttons in communication with said control system.

27. A method of dispensing a cup of hot freshly brewed beverage mixed with flavor

ingredients, filled with air bubbles and with a foamy topping, comprising:

spraying hot water onto a beverage bag of brewable substance placed inside a brew basket to brew said brewable substance and hence produce freshly brewed liquid concentrate;

said freshly brewed liquid concentrate is collected and stored in a container;

said freshly brewed liquid concentrate is reheated by transporting said freshly brewed liquid concentrate from said container to flow through a heat exchanger that is immersed in hot water;

reheated said freshly brewed liquid concentrate drained from said heat exchanger is mixed and whipped with hot water and flavor ingredients to form a mixture filled with air bubbles;

said mixture filled with air bubbles is dispensed into a cup;

28. A method for making hot freshly brewed tea or coffee mixed with flavor ingredients, filled with air bubbles and with a foamy topping, comprising:

spraying hot water onto said coffee or tea placed inside a brew basket to brew said coffee or tea and hence produce freshly brewed liquid concentrate of said coffee or tea;

collecting and storing said freshly brewed liquid concentrate in a container;

reheating said freshly brewed liquid concentrate by transporting said freshly brewed liquid concentrate from said container to flow through a heat exchanger which is immersed in hot water;

mixing and whipping said reheated freshly brewed liquid concentrate drained from said heat exchanger with hot water and flavor ingredients to form a mixture filled with air bubbles.

29. A brew basket with a plurality of compartments for storing a plurality of bags of brewable substance, comprising :

a base and a sidewall at the periphery of said base to make up said brew basket;

a handle at said sidewall for user to hold said brew basket;

a plurality of partitions within said brew basket to make up a plurality of compartments, each said compartment stores a bag of brewable substance;

a plurality of openings at above said plurality compartments to receive hot water sprayed from a plurality of sprayheads, each said sprayhead sprays hot water to each corresponding said compartment;

a plurality of fins at the base of said brew basket to lift said bag of brewable substance;

at least one opening at the base of each said compartment for liquid to exit said compartment; and

a flange to attached said brew basket to a coffee or tea making machine.

30. A hot water tank for a beverage dispenser, comprising :

a valve used for sharing hot water from said hot water tank of said beverage dispenser to any adjacent dispensers.