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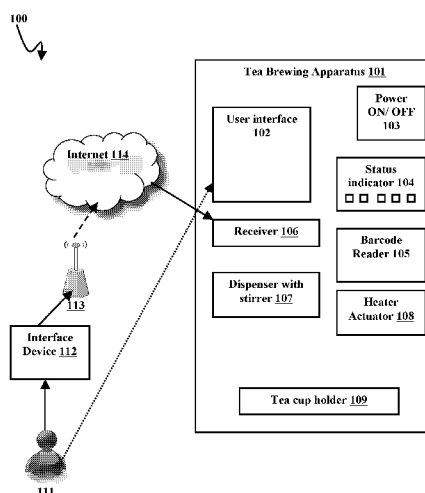
(54) **Title:** AN AUTOMATIC TEA BREWING APPARATUS

Figure .1

(57) **Abstract:** The present invention relates to a tea brewing apparatus 101. The invention provides an apparatus to selectively add the ingredients from a user interface or a bar code/QR code that is generated according to user recipe. For brewing the tea, the main ingredient required is tea powder, which is packed and sealed inside a tea cup or is dispensed from the dispenser integrated in the apparatus. The other ingredients include hot water, milk, and sugar; wherein the hot water is added to the tea cup by means of water through a flow meter and steam generator. Then the measured quantity of milk is added to the tea cup from the milk container which is placed on load cell. Further, the tea cup or vessel with mixture of tea leaves, hot water and/or milk can be boiled by dipping cart-ridge or pencil heater or an induction heater. Finally, the mixture is filtered using cup-in-cup or disposable French press or non-woven tea bag or a strainer.



AN AUTOMATIC TEA BREWING APPARATUS

FIELD OF INVENTION

[0001] The embodiment herein relates to the field of hot beverages making apparatus. Particularly the invention is related to a tea brewing apparatus with an intelligent communication system to prepare the tea according to a recipe given by a user.

BACKGROUND AND PRIOR ART

[0002] In worldwide, tea is the most widely consumed drink, after water. Tea is an aromatic hot beverage that is prepared by adding hot or boiling water to the tea leaves. The tea is also prepared by adding milk and sugar with the hot water in which tea leaves get infused. China and India are the largest tea manufacturing countries, and they consume tea with different flavors such as cardamom, jasmine, ginger, lemon and so on. Further many varieties of tea leaves are also produced such as Assam tea, Darj leeling tea, Chinese greens and so on.

[0003] Tea consumers across the countries want to have the tea instantly without the need for a person to brew the tea. Further, in order to minimize the tea preparation time and to get the tea instantly, when it is required, many tea brewing apparatus are developed across the world. Every tea brewing apparatus has different tea preparation technique, but the raw material requirement is same, that is tea powder or leaves, hot water, milk or condensed cream or milk powder, and sugar or sweetener.

[0004] Nowadays in existing tea brewing apparatus, basic tea preparation method has three types; in that, first method is premix powder based that is the apparatus has a premix powder that comprises of milk powder, sugar powder and tea powder is mixed with hot water to get the instant tea. Second method is using tea bag, in which warm water/milk is dispensed from the apparatus and the user dips the tea bag in this warm water/milk mixture for multiple times and reheats the mixture in microwave oven to get the tea. In third method, tea powder is packed in capsule or pod through which warm water at higher pressure and temperature is pushed and then tea is dispensed in the cup.

[0005] However, some drawbacks exist in each and every tea brewing apparatus. In general, the most common feedback from the user is the tea that is prepared by the

apparatus is not as tasteful and strong as homemade tea. Further every apparatus stores the ingredients (sugar powder, premix, milk) inside the machine for the tea preparation and the apparatus needs valves, pumps, long pipes and tubes to supply milk or tea decoction. Hence frequent cleaning of the internal components of the apparatus is required. Along with that the recipe for preparation of is not decided by the user, the apparatus utilizes predetermined standard recipe for all users. That is the tea brewing is not user specific. Furthermore instruction for brewing tea to the apparatus can be given by the user only when the user operates the apparatus by direct touch. Most importantly, to make Indian style tea, the tea leaves must be boiled with water and/or milk for it to become strong in taste. No automatic tea apparatus available in the market boils the tea leaves to obtain a strong liquor.

[0006] Therefore, there is a need for an apparatus for brewing tea automatically and instantly without a lot of maintenance and the taste must be equal to homemade tea and sugar or premix powder are not stored inside the apparatus. Further there is a need for an apparatus that does not needs valves, pumps, long pipes and tubes to supply milk or tea decoction which leads to the requirement for frequent cleaning. Furthermore there is a need for an apparatus, which can provide a tea based on user specific recipe and the apparatus must have the facility to operate remotely through wireless network or Bluetooth for making the tea.

OBJECTS OF THE INVENTION

[0007] Some of the objects of the present disclosure are described herein below:

[0008] A main object of the present invention is to provide an apparatus for tea brewing to prepare the instant tea as good as homemade tea by boiling the tea leaves with water and/or milk and ensuring that accurate amount of water, milk and tea leaves are used in each and every preparation.

[0009] Another object of the present invention is to provide an apparatus for tea brewing that holds the teacup, which is packed with tealeaves instead of keeping the tea powder inside the apparatus.

[00010] Still another object of the present invention is to provide an apparatus for tea brewing that does not need valves, pumps, long pipes and tubes to supply milk or tea decoction, which leads to the requirement for frequent cleaning.

[00011] Yet another object of the present invention is to provide an apparatus for tea brewing that can provide a tea based on user specific recipe instead of standard predetermined recipe.

[00012] Another object of the present invention is to provide an apparatus for tea brewing must have the facility to operate remotely through wireless network or Bluetooth device for making an order for the tea from the work place.

[00013] Another object of the present invention is to provide an apparatus for tea brewing that can be operated automatically in a hygienic manner.

[00014] Another object of the present invention is to provide an apparatus for tea brewing that can be operated conveniently without much more complexity.

[00015] Another object of the present invention is to provide an apparatus for tea - brewing which stores and dispenses stored tea leaves to the teacup or vessel according to the user preference.

[00016] Another object of the present invention is to provide an apparatus for tea brewing, which has an induction module integrated with the apparatus at the bottom of the pan for preparing multiple cups of tea.

[00017] The other objects and advantages of the present invention will be apparent from the following description when read in conjunction with the accompanying drawings, which are incorporated for illustration of preferred embodiments of the present invention and are not intended to limit the scope thereof.

SUMMARY OF THE INVENTION

[00018] In view of the foregoing, an embodiment herein provides a tea brewing apparatus, which prepares the tea same as homemade tea comprises of a microcontroller for controlling the apparatus; a user interface means for allowing a user to communicate with the apparatus for providing tea brewing recipe; a power ON/ OFF

switch means for turning on and off the apparatus; a status indicator means for indicating process status of the apparatus to the user; a barcode/QR reader for allowing the apparatus to read the barcode provided by the user ; a receiver means for receiving recipe from the user through internet or Bluetooth device (mobile, tablet, etc); wherein
5 | the a heater actuator for activating the heating means to boil the water and tea leaves in a tea cup or a tea container [may also referred as vessel]; wherein the tea cup which has a tea powder that is sealed in it; wherein a barcode/QR supplied by the user can be used to customize user's tea or the tea cups have barcode/QR code attached on the tea cup.

10 | **[00019]** According to an embodiment, particularly for preparing a user specific tea, the tea cups can be attached with including but is not limited to a barcode/QR code, which is generated according to the user specification or recipe; wherein the user recipe includes the ingredients' quantity, temperature of the hot water and milk, boiling profile, time duration for getting the expected tea decoction and so on. The barcode
15 | /QR code is attached on the tea cup or is provided by the user can be detected by the tea brewing apparatus and accordingly when the user presses the start button then water is fetched from the water line or a water reservoir using a pump through flow meter. When desired amount of water is fetched from the water reservoir, the water is allowed to pass through a steam heater then the flow rate is adjusted by the pump to ensure the
20 | desired dispensing temperature of the water.

[00020] According to an embodiment, the heating means includes but is not limited to a cartridge heater, induction heater and so on. The cartridge heater is a pencil type heater. The cartridge heater is coated with a nonstick coating such as with a ceramic or Teflon material in order to prevent adsorption of milk or tea extract on to the surface of
25 | the cartridge heating element. After that the hot water is dispensed in the teacup that is placed by the user. Then the cartridge heating element is adjusted to move down (into the cup or vessel) by a certain pre-adjusted distance. The motion of the cartridge heating element can be carried out using combination of various basic linkage mechanisms.

[00021] In accordance with an embodiment, after dipping the cartridge heater in the tea cup or a vessel, which is partially filled with water and tea leaves, the mixture is boiled for required time period as per the recipe. However the dipping and heating of mixture in the teacup is performed only, if the water needs to be boiled as per the recipe. Then
5 after boiling the water for a predetermined time required by a particular recipe, the cartridge heating element moves back to its earlier position, unless the recipe demands boiling of milk by the cartridge heater.

[00022] In accordance with an embodiment, if the recipe requires the milk, then milk is fetched through milk container. Passing water at a pre-adjusted flow rate through
10 steam heater that generates the steam. This steam is passed through a venturi module. In the venturi module, another end of a pipe is dipped in milk container that is fixed at a location where the low pressure is created inside the venturi module. This low pressure creates suction and sucks the milk out of the container. The milk then interacts with the flowing steam and gets heated up. Milk container is designed to be kept on top of a
15 load cell to ensure the required quantity of milk is dispensed. As milk flows out of the milk container, the load cell reports reducing load cell values. The difference between the starting load cell value and current load cell value is the amount of milk that needs to be dispensed as per the recipe. As soon as the desired weight of milk is fetched the pump is stopped and the steam from flowing in the venturi module and is routed to
20 either the drain path or the water path so that the milk is not fetched anymore. After that the dipped cartridge heating element can boil the milk in case the recipe demands for it. In this case, the cartridge heating element does not move up after boiling water but instead stays to boil tea milk-water mixture. At the end of the heating process, the cartridge heating element is cleaned by spraying hot steam streams from two
25 diametrically opposite sides throughout the length of cartridge heating element. Further in order to prevent the milk from boiling over, the cartridge heating element power may be reduced or a small blower is installed to blow the air on the surface of the tea and puncture the milk bubbles that may form. And also the small blower is used to blow air on the surface of milk so that it does not boil over.

[00023] According to an embodiment, the tea powder or tea leaves present in the prepared tea can be strained in using a predefined method which can include but not limited to cup-in-cup, a disposable French press, and a porous paper wrapped inside the cup or a standard strainer. In an embodiment, a cup-in-cup is utilized to provide by two
5 of similar size with one cup inside the other. Accordingly, the user places the cup-in-cup at the tea brewing location. The inside cup may include holes at the bottom and that is a disposable or non-disposable cup which is meant to be pulled out once the beverage is done brewing. While doing so all the residue of tea may be strained out with the inner tea cup, then the liquid mixture (water/milk) may drained out through holes at the
10 bottom of inner tea cup into the outer tea cup.

[00024] In accordance to an embodiment, the recipe from the user can also received at the receiver present in the apparatus. By means of this receiver, the order for the tea can also obtain from the user, who is present remotely from the apparatus location in the same premises. The receiver has a wireless responder to connect the tea brewing
15 apparatus with the wireless interfacing device. The user interface can connect to the microcontroller of the apparatus through Bluetooth interface. This user interface can connect to the internet and can upload the key parameters of the apparatus on the website. The user can login to the website and take a look at the data uploaded. This adds to preventive maintenance and hassle-free accounting.

[00025] According to an embodiment, a disposable French press is utilized for straining out the tea powder. Accordingly, there is no inside cup with holes but only one cup. In this method, the user is provided with a disposable French press, which can be used to push down the residue in the cup, while all the liquid mixture is directed to pass through the filter section of the French press and stay on the top. Then entire tea
20 residue may be pushed and collected at the bottom of the teacup.

[00026] According to an embodiment, a porous paper that can be wrapped inside the cup, in which the tea is brewed and once the user has brewed the tea, the user can remove the porous paper, which contains the tealeaves residue in it.

[00027] According to another embodiment, the apparatus for brewing a user specific tea as same as that of homemade tea comprises, a microcontroller, a user interface means for allowing a user to communicate with the apparatus for providing tea brewing recipe; a power ON/ OFF switch means for turning on and off the apparatus; a status indicator means for indicating process status of the apparatus to the user; a barcode/QR code reader means for allowing the apparatus to read the barcode/QR code provided in a tea cup or supplied by the user from his mobile or by any other means; a receiver means for receiving recipe from an interface device through internet or any other wireless device; wherein the user can upload remotely the key parameters of the tea on a website using the interface device; wherein the a heater actuator for bringing the cartridge heater down; characterized in that, a tea leaves dispenser for dispensing tea leaves to the tea cup based on user recipe; wherein the barcode/QR code of the recipe can be provided in an image form on handheld devices such as mobile/tablet and scanned by the barcode/QR code reader present on the apparatus for making the tea same as homemade tea.

[00028] According to another embodiment, the induction heater is integrated with the apparatus at the bottom of a tea cup (or an induction compatible vessel) holder. This type of heating arrangement is specially meant for preparing multiple cups of tea at a time. Further, due to induction heating, the mixture (milk, water, and tea) tends to boil over. A small blower is programmed and mounted above the tea cup holder for preventing mixture from falling over the tea cup holder due to boil over.

[00029] These and other aspects of the embodiments herein will be better appreciated and understood when considered in conjunction with the following description and the accompanying drawings. It should be understood, however, that the following descriptions, while indicating preferred embodiments and numerous specific details thereof, are given by way of illustration and not of limitation. Many changes and modifications may be made within the scope of the embodiments herein without departing from the spirit thereof, and the embodiments herein include all such modifications.

BRIEF DESCRIPTION OF DRAWINGS

[00030] The detailed description is set forth with reference to the accompanying figures. In the figures, the left-most digit(s) of a reference number identifies the figure in which the reference number first appears. The use of the same reference numbers in
5 different figures indicates similar or identical items.

[00031] Fig.1 illustrates an exemplary model of external layout of a tea brewing apparatus, according to an embodiment therein; and

[00032] Fig. 2 illustrates an exemplary model of internal block diagram of a tea brewing apparatus, according to an embodiment therein.

10 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[00033] The embodiments herein and the various features and advantageous details thereof are explained more fully with reference to the non-limiting embodiments and detailed in the following description. Descriptions of well-known components and processing techniques are omitted so as to not unnecessarily obscure the embodiments
15 herein. The examples used herein are intended merely to facilitate an understanding of ways in which the embodiments herein may be practiced and to further enable those of skill in the art to practice the embodiments herein. Accordingly, the examples should not be construed as limiting the scope of the embodiments herein.

[00034] As mentioned above, there is a need to provide an apparatus for tea brewing to
20 conveniently prepare the tea as good as the homemade tea. The embodiments herein achieve this by providing an apparatus for tea brewing to provide a tea based on user specific recipe or standard predetermined recipe and the apparatus can be operated remotely through wireless network for making an order for the tea from the work place. Referring now to the drawings, and more particularly to FIGS. 1 through 2, where
25 similar reference characters denote corresponding features consistently throughout the figures, there are shown preferred embodiments.

[00035] It is to be noted that even though the description of the invention has been explained with respect to tea brewing apparatus, it should, in no manner, be construed to limit the scope of the invention. The systems and methods of the invention can apply

to any other types of brewing apparatus wherein the specific brewing chamber/method can be used.

[00036] According to an embodiment, the tea brewing apparatus prepares the tea same as homemade tea by using a tea cup which has a tea powder that is sealed in it or by using the tea leaves dispensed by the brewer in the tea cup. Particularly for preparing a user specific tea, the tea cups can be attached with a barcode / QR code and not limited to it, which is generated according to the user specification; wherein the user specification includes the ingredients' quantity, temperature of the hot water and milk, time duration for getting the expected tea decoction and so on. The barcode /QR code that is attached on the tea cup or is supplied the user externally (through mobile) can be detected by the tea brewing apparatus and accordingly when the user presses the start button then water is fetched from the water line or a water reservoir using a pump through flow meter. The water is allowed to pass through a steam heater and constant temperature is maintained for the steam heater. Then the flow rate is adjusted by the pump to ensure the desired dispensing temperature of the water. The cartridge heater dipped in the tea cup is coated with a nonstick coating such as with a ceramic or Teflon material in order to prevent adsorption of milk or tea extract on to the surface of the cartridge heater. After that the hot water is dispensed in the tea cup that is placed by the user and simultaneously the cartridge heating element is adjusted to move down by a certain pre-adjusted distance. The motion of the cartridge heater can be carried out using combination of basic linkage mechanism.

[00037] In accordance with an embodiment, after dipping the cartridge heater in the tea cup, which is partially filled with water and tea leaves, the mixture inside tea cup, is boiled for required time period as per the recipe. However the dipping and heating of mixture in the tea cup is performed only, if the water needs to be boiled as per the recipe. Then after boiling the water for time required by a particular recipe, the cartridge heater moves back to its earlier position, unless the recipe demands boiling of milk by the cartridge heater.

[00038] In accordance with an embodiment, if the milk is required by the recipe, then milk is fetched through milk container. The steam is generated by passing water at a pre-adjusted flow rate through steam heater. This steam is passed through a venturi module. In the venturi module, another end of a pipe is dipped in milk container that is fixed at a location where the low pressure is created inside the venturi module. This low pressure creates suction and sucks the milk out of the reservoir. The milk then interacts with the flowing steam and gets heated up. Milk container is designed to be kept on top of a load cell to ensure the required quantity of milk is dispensed. As milk flows out of the milk container, the load cell reports reducing load cell values. The difference between the starting load cell value and current load cell value represents the amount of milk dispensed. As soon as the desired weight of milk is fetched the pump is forced to stop the steam from flowing in the venturi module and is routed to the drain in the drip tray so that the milk is not fetched anymore. After that the milk can be boiled by the dipped cartridge heater in case the recipe demands. In this case, the cartridge heater does not move up after boiling water but instead stays to boil milk-water mixture. At the end of the heating process, the cartridge heating element is cleaned by spraying hot steam streams from two diametrically opposite sides throughout the length of cartridge heating element. Further in order to prevent the milk from boiling over, the cartridge heating element power may be reduced or a small blower 214 is installed to blow the air on the surface of the tea and puncture the milk bubbles that may form and prevent boil over. And also the small blower 214 is used to blow air on the surface of milk so that it does not boil over.

[00039] According to an embodiment, the tea powder or tealeaves present in the tea can be strained in following three different methods or by using a standard strainer. In first type, a cup-in-cup is utilized to provide by two of similar size with one cup inside the other. The user places the cup-in-cup at the tea brewing location. The inside cup has holes at the bottom and that is a disposable cup or non-disposable cup which is meant to be pulled out once the beverage is done brewing. While doing so all the residue of tea may be strained out with the inner tea cup, then the liquid mixture

(water/milk) may drained out through holes at the bottom of inner tea cup into the outer tea cup.

[00040] According to an embodiment, the second method is straining the disposable French press. In this type there is no inside cup with holes but only one cup. In this method, the user is provided with a disposable French press, which can be used to push down the residue in the cup, while all the liquid mixture is directed to pass through the filter section of the French press and stay on the top. Then entire tea residue may be pushed and collected at the bottom of the tea cup.

[00041] According to the preferred embodiment, the third method is using a porous paper that can be wrapped inside the cup, in which the tea is brewed and once the user has brewed the tea, the user can remove the porous paper, which contains the tealeaves residue in it.

[00042] Fig.1 illustrates an exemplary model of external layout of a tea brewing apparatus 100, according to an embodiment. The external layout of the tea brewing apparatus 101 comprises of a user interface 102, a Power ON/ OFF switch 103, a status indicator 104, a barcode reader 105, a receiver 106, a dispenser with stirrer 107, a heater actuator 108, a barcode dispenser 110 and a tea cup holder 109. Any user 111 can communicate directly with the tea brewing apparatus 101 or the user 111 can communicate using an interfacing device 112 through a transmitter 113 via an internet 114 in wireless or wired network.

[00043] In accordance to the embodiment, the user interface 102 is provided for communicating the recipe to the apparatus by the user. The user interface 102 can either operated through the interfacing device 112 or the user 111 can directly enter recipe details by providing the key parameters of the tea brewing recipe according to the requirement.

[00044] The representation of the interface device 112 in the form of a computing system or handheld computing system, within which a set of instructions for causing the device to perform any one or more of the methods described herein, may be executed. In various example embodiments, the device operates as a standalone device

or may be connected (e.g., networked) to other devices. The interface device can include but not limited to mobile telephone, tablet, laptop, personal digital assistant (PDA), smart phone, a web appliance, or any device capable of executing a set of instructions (sequential or otherwise) that specify actions to be taken by that device.

5 Further, while only a single device is illustrated, the term "device" shall also be taken to include any collection of devices that individually or jointly execute a set (or multiple sets) of instructions to perform any one or more of the methods discussed herein.

[00045] The exemplary interface device can include a processor or multiple processors (e.g., a central processing unit (CPU), a graphics processing unit (GPU), or both), a
10 main memory, and a static memory, which communicate with each other via a bus. The interface device may further include a display unit (e.g., a liquid crystal display (LCD)). The interface device may also include an alphanumeric input device (e.g., a keyboard), an image capturing device (e.g. camera), a cursor control device (e.g., a mouse), a signal generation device (e.g., a speaker, mic) and a network interface
15 device.

[00046] According to an embodiment, the tea brewing apparatus is turned ON and OFF by a power ON/OFF switch 103. The power supply is given to a microcontroller circuit (not shown) to generate control signals accordingly. In the embodiment a status indicator 104 provides the tea processing status of the apparatus. For example if the
20 apparatus preheats the water, then that process may indicate in the status indicator. Similarly for all the process the apparatus indicates the status.

[00047] Users can transmit the information using barcode, QR code or RFID tags. In accordance to an embodiment, the recipe from the user can also received at the receiver 106 present in the apparatus. By means of this receiver 106, the order for the tea can
25 also obtain from the user 111, who is present remotely from the apparatus location in the same premises. The receiver 106 has a wireless responder to connect the tea brewing apparatus with the WI-FI connected interfacing device. The interface device 112 can connect to the microcontroller of the apparatus through Bluetooth interface. This user interface can connect to the internet and allow the user to upload the key

parameters of the apparatus on the website. The user can login to the website and take a look at the data uploaded. This adds to preventive maintenance and hassle-free accounting.

[00048] According to an embodiment, to provide the hot water, sugar and milk (optional) to the user's tea cup, a dispenser 107 is attached to the tea brewing apparatus. The dispenser is controlled by a microcontroller to dispense required amount of tea leaves. In accordance to the embodiment, near to the dispenser a heater actuator 108 is provided to slide down the heating element if the recipe needs boiling of tea leaves and water for tea preparation. The heat actuator 108 works as combination of basic linkage mechanism and not limited to the above mentioned.

[00049] In another embodiment, the tea brewing apparatus includes of a tea cup holder 109 to hold the tea cup 213. The tea cup may be placed manually or automatically, when the order is placed by the user. The tea cup is sealed with tea powder or the tea leaves are dispensed by the user and barcode/QR code is supplied either on tea cup or by the user externally.

[00050] Fig. 2 illustrates an exemplary model of internal block diagram of a tea brewing apparatus 200, according to an embodiment. the internal block diagram of tea brewing apparatus includes a water reservoir 201, a flow meter 202, a cartridge heater 203, a heater actuator 108, a microcontroller 205, a load cell –milk 206, a suction 207, a steam heater 208, a sweetener 209, and a milk container 210. Further, the tea brewing apparatus includes a dispenser with stirrer 107, a receiver 106, a user interface 102, a barcode reader 105, a barcode dispenser 110, a power supply 212, a timer 211, a status indicator 104, and a tea cup 213.

[00051] According to an embodiment, the water reservoir 201 provides the water required for preparing the tea. When the user presses a start button then the water is fetched from the water line or a water reservoir 201 using a pump. The water reservoir 201 can be replaced when it is required, by getting an indication from the water level indicator. In accordance to the embodiment, the flow of water can be measured by a flow meter 202. A hall-effect type of flow meter is connected between the water line

(or reservoir) and the pump. When water flows through flow meter, the microcontroller
205 counts the number of pulses from the flow meter. These pulses then are used to
ensure that a desired amount of water (as required by the recipe) is passed through the
flow meter. The amount of water required is calibrated upfront as a function of number
5 of pulses sent by the flow meter 202.

[00052] According to an embodiment, the cartridge heater 203 is used to boil the
water/milk tea leaves mixture to extract strong tea liquor while the steam heater 208 is
used for increasing the temperature of the water as well to generate steam for fetching
the milk. The steam heater is maintained at a constant temperature and then the flow
10 rate is adjusted by the pump/flow meter to ensure the desire dispensing temperature of
the water. The hot water is then dispensed in the tea cup 213, which is placed by the
user 111.

[00053] According to an embodiment, the motion of the cartridge heater 203 can be
carried out using a heater actuator 108 by employing a combination of basic linkage
15 mechanism. This can be done using a linear screw actuator or pulley arrangement or
basic linkage mechanisms. In case, a combination of basic linkage mechanism is used,
then the heat actuator 108 is driven by a stepper motor or a regular DC motor to ensure
accurate amount of travelled distance by the cartridge heater 203. After this motion the
cartridge heater 203 dips in the tea cup 213 partially filled with water and containing
20 tea leaves and cartridge heater 203 boils the tea leaves and water mixture for a time
required as per the recipe. The above mentioned step is performed only if water needs
to be boiled as per the recipe. For example in case of milk based tea, it is highly desired
to boil the tea leaves so as to extract the strong taste out of the tea. After boiling the
water for time required by a particular recipe, the cartridge heater then goes back up in
25 its earlier position unless recipe demands boiling of milk by cartridge heating element
203. When the cartridge heating element 203 goes back to the earlier position, the
cartridge heating element 203 is cleaned by spraying hot steam streams from two
diametrically opposite sides throughout the length of cartridge heating element 203.

[00054] According to an embodiment, the tea brewing machine has the microcontroller 205 to control all the functionalities of the apparatus. The microcontroller 205 the assigns the appropriate values to the brewing variables inside the firmware. The brewing variables or parameters are water volume, milk volume, amount of time the cartridge heater 203 that boils the water and tea leaves, the amount of time the cartridge heating element 203 that boils the milk, water and tea leaves together etc. The contents in the cup can be coffee, tea, green tea or anything that can be prepared with warm water, boiling and and/or milk. The microcontroller 205 interlinks all other internal components in the apparatus.

[00055] According to an embodiment, if the recipe requires milk then milk is fetched through milk container 210. Passing water at a pre-adjusted flow rate through steam heater 208 generates the steam. Then the steam is passed through a venturi module. In the venturi module, another end of a pipe dipped in milk container 108 is fixed at a location, where the low pressure is created inside the venturi module. Consequently the low pressure creates suction 207 and sucks the milk out of the milk container. The milk then interacts with the flowing steam and gets heated up. The milk container 210 is designed to be kept on top of a load cell to ensure the required quantity of milk is dispensed. Before turning ON the cycle, the milk fetching cycle starts, the microcontroller 205 reads the starting value off the load cell. As milk flows out of the milk container, the load cell 206 reports reducing load cell values. The microcontroller 207 continuously checks the difference between the starting load cell value and current load cell value. As soon as the desired weight of milk is fetched, then the pump is stopped to block the steam from flowing in the venturi module and is routed to the drain in the drip tray, so that milk is not fetched anymore. After dispensed in the cup, it can be boiled by the (cartridge heating element) heating element 203 that is dipped, in case the recipe demands it. In this case the cartridge heating element 203 does not move up after boiling water but instead stays to boil milk-water mixture. Further to prevent the milk from higher boiling, the (cartridge heating element) heating element power may get reduced or a small blower 214 may be installed on to the

apparatus. The small blower 214 blows the air on the surface of the tea, and punctures the milk bubbles formation. And also the small blower is used to blow air on the surface of milk so that it does not boil over. Further sweetener 209 can be added to the tea if it is mentioned in the recipe. The sweetener may be a sugar crystal or powder or cubes.

[00056] According to an embodiment, the microcontroller 205 generates signal as per time requirement for the process of tea powder infusion or boiling time. A timer 211 controls the time limit. According to an embodiment, a power supply 212 unit is provided to deliver uninterrupted power to the microcontroller 205.

[00057] According to an embodiment, the tea brewing apparatus provides a special type of tea cup 213. The tea cup 213 is placed on top of the tea cup holder 109 either manually or automatically. While preparation of the tea, the final mixture of tea powder, sugar, and milk requires straining of the residue that is formed due to the tea powder or tealeaves. The straining can be performed by three different methods by varying the tea cup models or by using a standard strainer.

[00058] According to an embodiment, the tea cup 213 can be a multilayered cup that is cup-in-cup model. In this model the user is provided with two of similar size with one cup inside the other. The inner layer of the tea cup has holes at the bottom and is a disposable or non-disposable cup which is meant to be pulled out once the beverage is done brewing. While doing so, all the residue of tea is strained out with the inner tea cup, and then the liquid mixture (water/milk) is drained out through holes at the bottom of inner tea cup into the outer tea cup.

[00059] According to another embodiment, the tea cup 213 utilizes a disposable French press which is used to push down the residue present in the bottom of the tea cup; where the entire liquid mixture may pass through the filter section of the French press and stay on the top, and all the tea residue may be pushed and collected at the bottom of the tea cup.

[00060] According to another embodiment, the tea cup 213 utilizes a porous paper which is wrapped inside the tea cup. When the user brews the tea, the residue is settled

at the bottom of the tea cup and that can be removed by the user by lifting and removing the porous paper from the tea cup.

[00061] According to an embodiment, the tea brewing apparatus can be operated automatically in a hygienic manner. According to an embodiment, the tea brewing apparatus can be operated conveniently without more complexity. The tea brewing apparatus can be used in places like restaurants, coffee bars, work places and not limited to above mentioned locations.

[00062] According to another embodiment, the apparatus for brewing a user specific tea as same as that of homemade tea comprises, a user interface means for allowing a user to communicate with the apparatus for providing tea brewing recipe; a power ON/OFF switch means for turning on and off the apparatus; a status indicator means for indicating process status of the apparatus to the user; a barcode reader 105 means for allowing the apparatus to read the barcode provided in a tea cup 213; a receiver means for receiving recipe from an interface device through internet; wherein the user can upload remotely the key parameters of the tea on a website using the interface device; wherein the a heater actuator for activating the heating means; characterized in that, a tea leaves dispenser 204 for dispensing tea leaves to the tea cup based on user recipe; wherein a barcode/QR code can be supplied by the user through a mobile or inputs through the user interface and scanned by the barcode reader for making the tea as same as homemade tea.

[00063] According to another embodiment, the cartridge heater can be replaced with an induction heater 215 that is integrated with the apparatus at the bottom of the tea cup holder. This type of heating arrangement is specially meant for preparing multiple cups of tea at a time. Further, due to induction heating heater, the mixture (milk, water, and tea) tends to boil over. For this, a small blower 214 is mounted above the tea cup holder for preventing mixture from falling over the tea cup holder due to boil over.

[00064] The foregoing description of the specific embodiments will so fully reveal the general nature of the embodiments herein that others can, by applying current knowledge, readily modify and/or adapt for various applications such specific

embodiments without departing from the generic concept, and, therefore, such adaptations and modifications should and are intended to be comprehended within the meaning and range of equivalents of the disclosed embodiments. It is to be understood that the phraseology or terminology employed herein is for the purpose of description
5 and not of limitation. Therefore, while the embodiments herein have been described in terms of preferred embodiments, those skilled in the art will recognize that the embodiments herein can be practiced with modification within the spirit and scope of the embodiments as described herein.

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I Claim:

1. An apparatus 101 for brewing a user specific tea in a tea cup or vessel that tastes same as that of homemade tea comprises,
a microcontroller 205 for controlling the apparatus; wherein the microcontroller
5 205 interlinks all other internal components in the apparatus;
a user interface 102 means for allowing a user 111 to communicate with the apparatus for providing tea brewing recipe;
a power ON/ OFF switch 103 means for turning on and off the apparatus;
a status indicator 104 means for indicating process status of the apparatus to the
10 user;
a heater actuator 108 for moving a cartridge heater down to boil the water in the tea cup or a tea container;
characterized in that, wherein a milk container 210 for providing milk for the recipe; wherein the milk is fetched by passing water at a pre-adjusted flow rate
15 through the steam generator 208 that generates steam; wherein the flow rate of the steam is adjusted by a flow meter 202;
wherein the steam is passed through a venturi module for sucking the milk out of the container;
wherein one or more heating means are used to boil/heat the water/milk/tea
20 mixture in the vessel or the tea cup;
wherein the milk container 210 is designed to be kept on top of the load cell 206 to ensure the required quantity of milk is dispensed accurately; and
wherein a blower 214 is installed above the tea cup or vessel to prevent the boil over by puncturing the surface created on tea/milk/water mixture when boiling
25 takes place.

2. The apparatus of claim 1, wherein the heating means includes a cartridge heater, or an induction heater, wherein the induction heater 215 provided in place of the tea cup holder for heating the milk, tea leaves, water mixture; wherein the induction heater 215 provided for preparing multiple cups of tea at a time.
- 5 3. The apparatus of claim 2, wherein the cartridge heater 203 is provided for boiling the water and tea leaves and/or milk in case the recipe demands; wherein the cartridge heater 203 is coated with a nonstick coating such as with a ceramic or Teflon material in order to prevent adsorption of milk or tea extract on to the surface of the cartridge heater 203; and
10 wherein the motion of the cartridge heater 203 is carried out using combination of basic linkage mechanism.
4. The apparatus of claim 1, wherein the apparatus further includes a receiver 106 means for receiving standard input or custom recipe from an interface device 112 through internet or wireless protocol 114
- 15 5. The apparatus of claim 1, wherein the apparatus further includes a tea cup holder 109 means for holding the tea cup 213 or the tea container in appropriate position; wherein the tea container utilized for making multiple cups of tea at a time; wherein the tea container is an induction compatible vessel; and a dispenser means for dispensing water and/ or milk to the tea cup.
- 20 6. The apparatus of claim 1, wherein the tea cups 213 sealed with a tea powder adequate for single tea preparation.
7. The apparatus of claim 1, wherein the apparatus further includes a tea leaves dispenser 204 for dispensing tea leaves to brew tea according to the user recipe.
8. The apparatus of claim 1, wherein the apparatus further includes,
25 a steam heater 208 for generating steam out of the water fetched by a pump.

9. The apparatus of claim 1, wherein the apparatus further includes
a water reservoir 201 for fetching water for the tea using the pump through flow
meter 202;
wherein the flow rate is adjusted by the combination of pump and flow meter to
5 ensure the desired dispensing temperature of the water; and
wherein the desired amount of water is allowed to pass through the steam
heater 208.
10. The apparatus of claim 1, wherein the apparatus further includes a load cell 206
for providing information related to the quantity of milk that is fetched from the
10 milk container 210.
11. The apparatus of claim 1, wherein the apparatus further includes
a barcode/QR code supplied by the user through the user interface for the
apparatus to understand the tea brewing recipe as desired by the user or choose
standard recipe; and wherein a barcode reader 105 provided for allowing the
15 apparatus to scan the barcode provided in the tea cup for making the tea.
12. The apparatus of claim 9, wherein the pump forced to stop the steam from
flowing in the venturi module, when the desired amount of milk is fetched.
13. The apparatus of claim 1, wherein the cartridge heating element 203 is cleaned
by spraying hot steam streams from two diametrically opposite sides throughout
20 the length of cartridge heating element 203.
14. The apparatus of claim 1, wherein the apparatus further includes a small blower
214 to blow air on the surface of the tea, water and milk mixture and puncture
the milk bubbles formed on top of the tea cup 213.

15. The apparatus of claim 1, wherein the tea leaves present in the tea strained using a cup-in-cup filter, a disposable French press and a porous paper that is wrapped inside the cup or by using a standard strainer.
16. The apparatus of claim 1, wherein a bottom cup of the cup-in-cup filter is a metal based cup and a top cup of the cup-in-cup filter is a nonwoven cloth cup or a porous paper cup.
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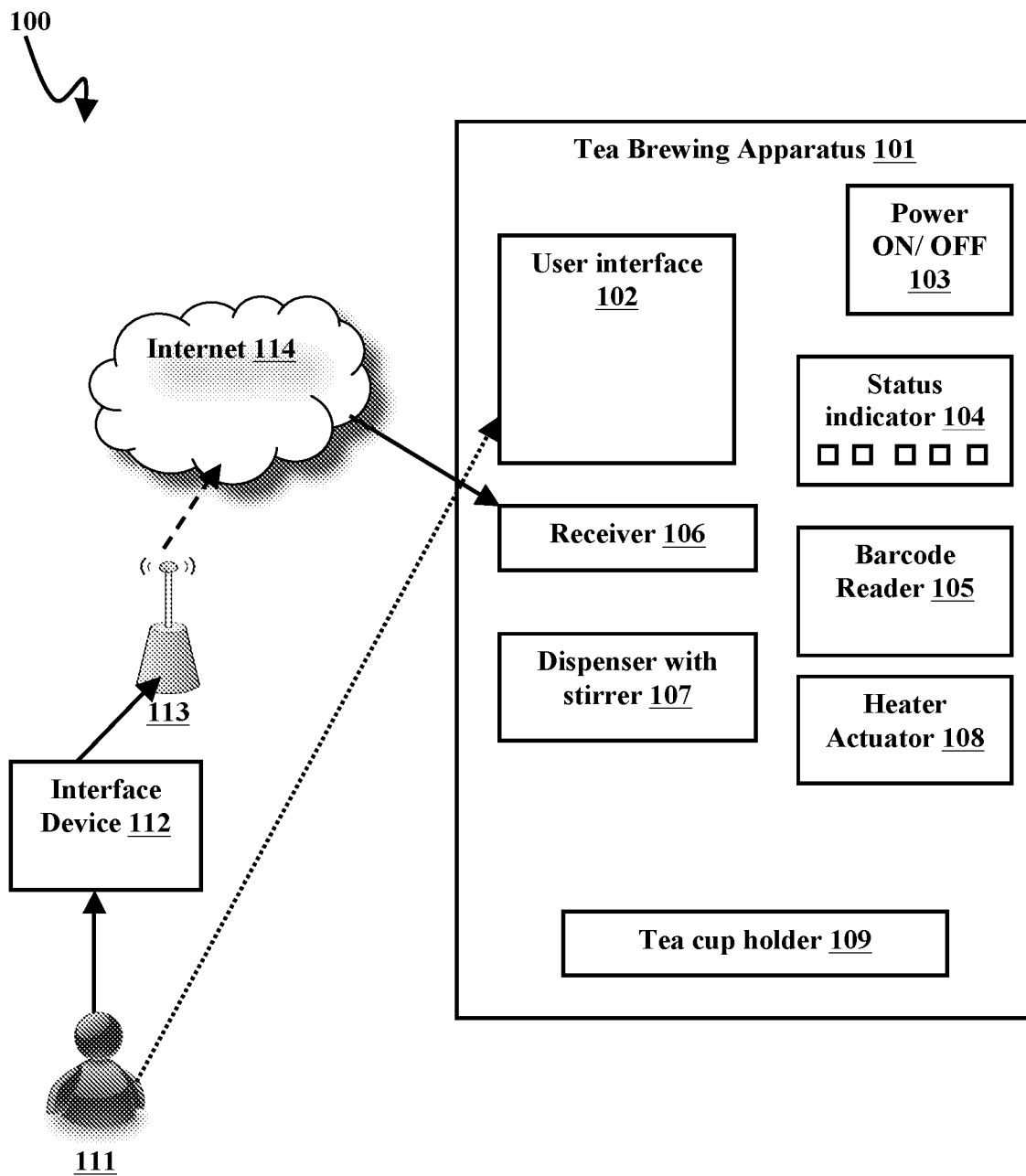


Figure .1

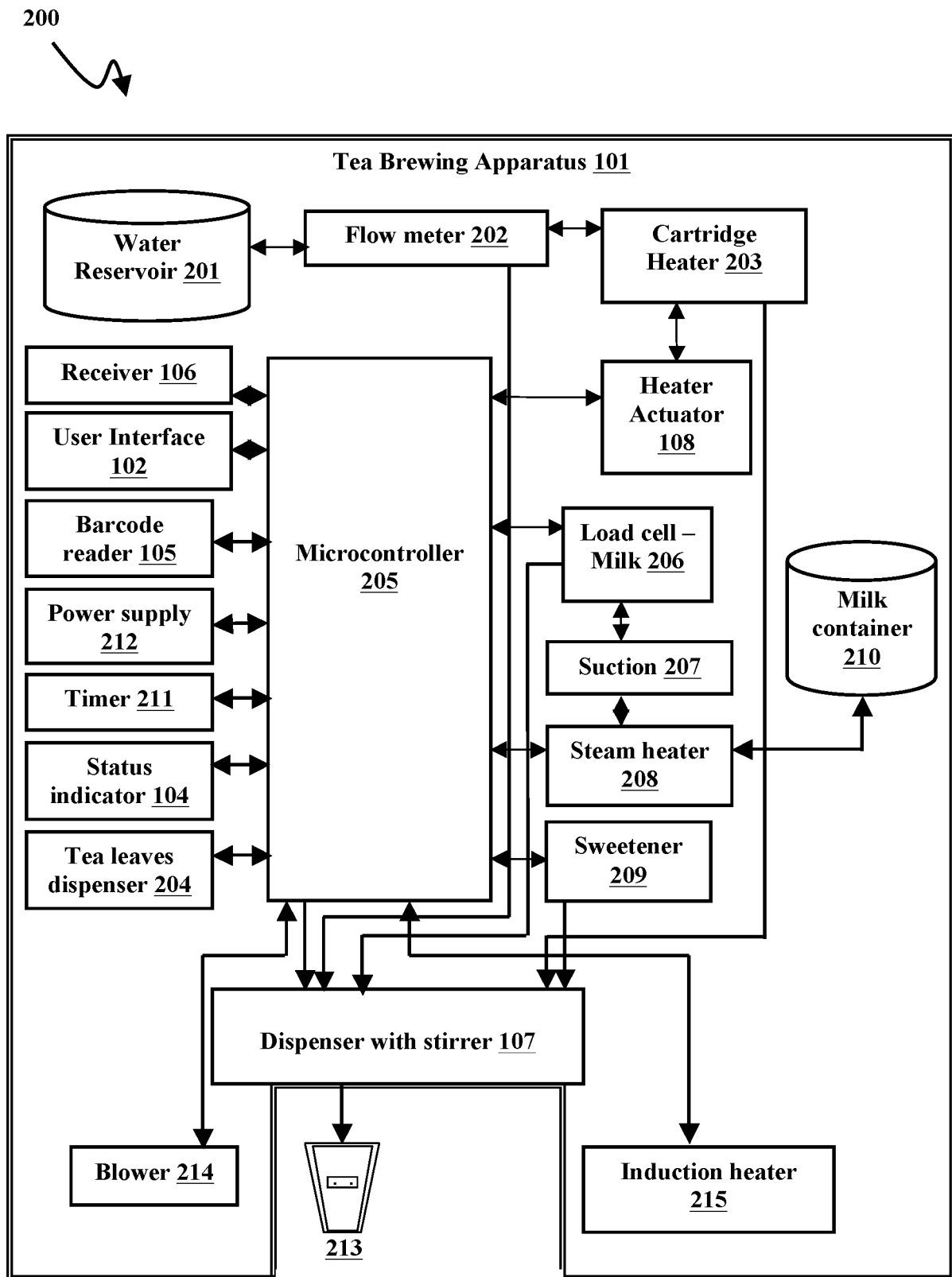


Figure .2

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2017/050153

A. CLASSIFICATION OF SUBJECT MATTER
H05B6/00, A47J31/00 Version=2017.01

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

H05B, A47J, G05B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Databases: Patseer, IPO Internal Database

Keywords: brewing apparatus, remotely controlled, sensor, venturi system

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO2013191710A1 (HOOG, D KLAUS et al.) 27 December 2013 (27.12.2013) Abstract; Paragraphs: [0016], [0028], [0029], [0034]; Claim: 1.	1-16
Y	US 20090293733 A1 (COFFEE NATION LTD.) 3 December 2009 (03.12.2009) Paragraphs: [0047], [0140], [0149], [0154], [0155]; Fig.: 3, 14, 16.	1-16
Y	CN 103230217 A (SICHUAN UNIV) 07 August 2013 (07.08.2013) Paragraph: [0010]	1-16

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier application or patent but published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

12-04-2017

Date of mailing of the international search report

12-04-2017

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/IB2017/050153

Citation	Pub.Date	Family	Pub.Date
WO 2013191710 A1	27-12-2013	US 9280271 B2	08-03-2016
		US 9542151 B2	10-01-2017
US 20090293733 A1	03-12-2009	GB 2451005 B	23-09-2009
		GB 2452607 A	11-03-2009
		GB 2438803 B	26-11-2008
		JP 2008531162 A	11-08-2008
		WO 2006090183 A8	21-12-2007
		EP 1855571 A2	21-11-2007
		IN DELNP-2007-06555 A	14-09-2007