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(54) **APPLIANCE FOR PRODUCING HOT DRINKS**

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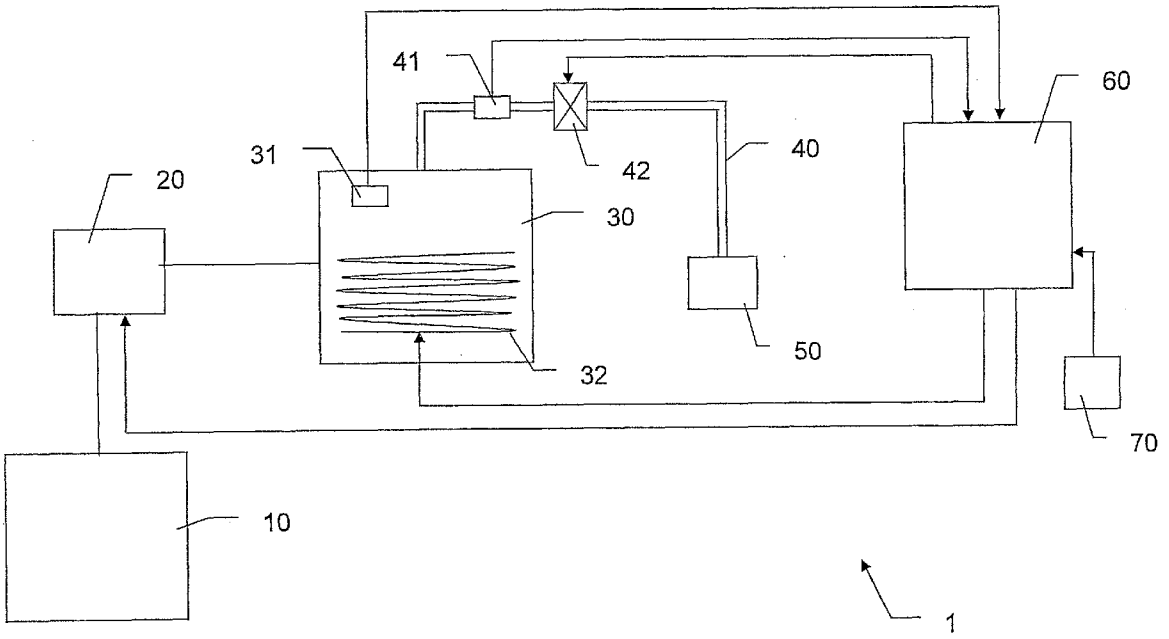
(57) **ABSTRACT**

An appliance for producing hot drinks comprising a water heating device; a heat source; a seat adapted to receive a product for preparing the drink; a duct for feeding hot water from the water heating device to the seat; a first temperature sensor associated with the water heating device; a control unit operatively associated with the temperature sensor and with the heat source said control unit the temperature of the water contained in the device, by switching on/switching off the heat source based on the temperature detected by the temperature sensor; a second temperature sensor associated with the hot water feeding duct; and said control unit is being adapted to control the temperature of the water contained in the device by switching on/switching off the heat source also based on the temperature detected by the second temperature sensor.



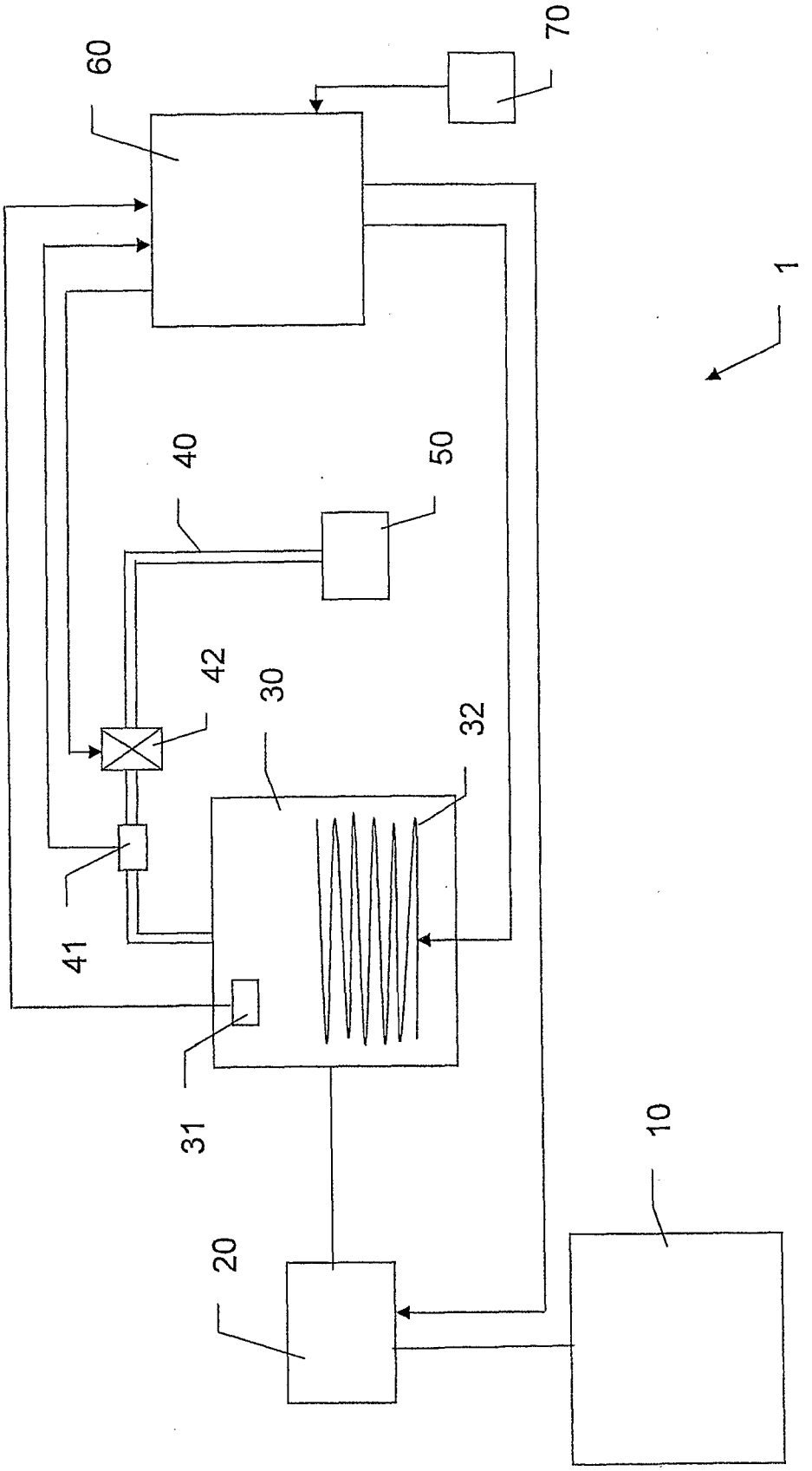


Fig.1

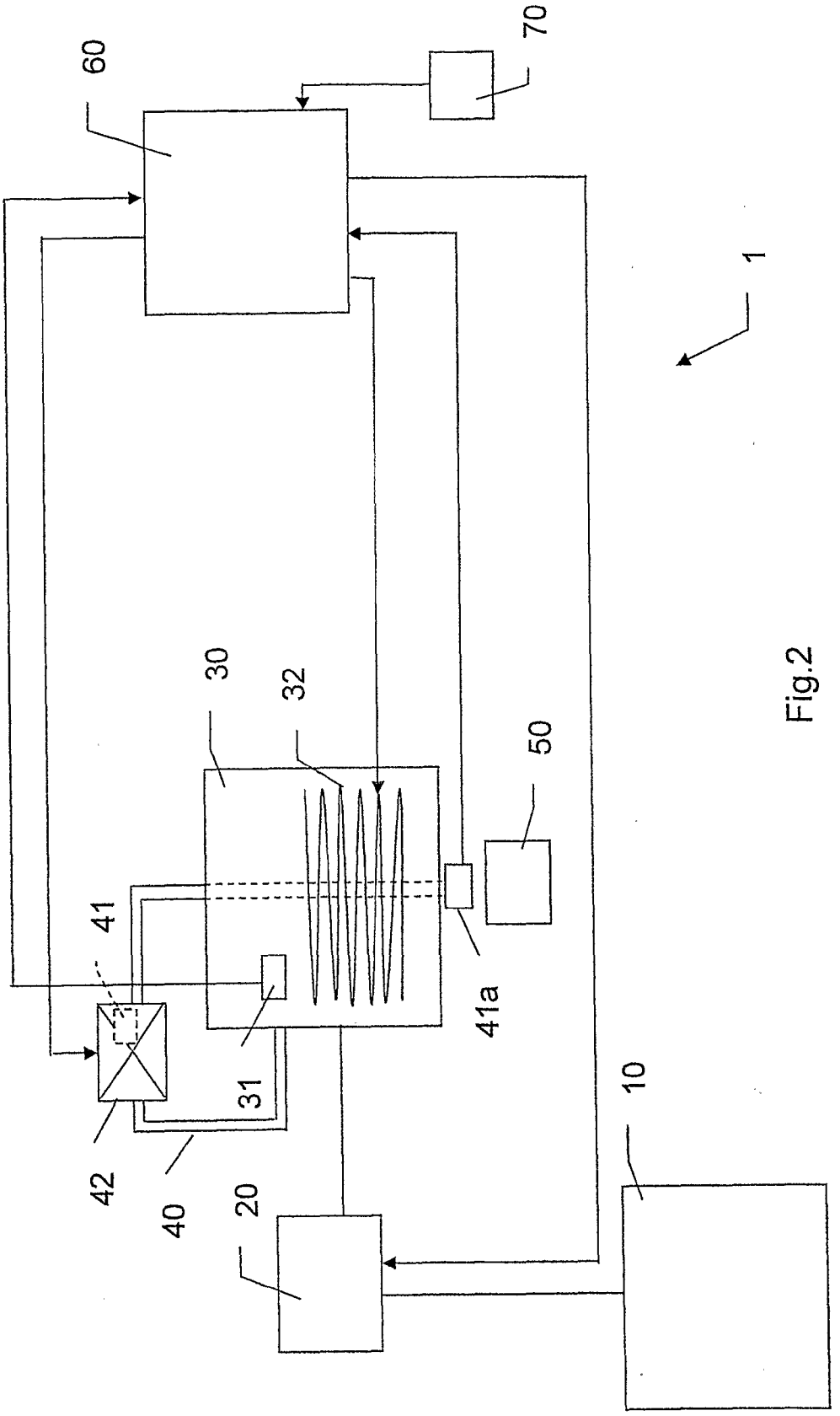


Fig.2

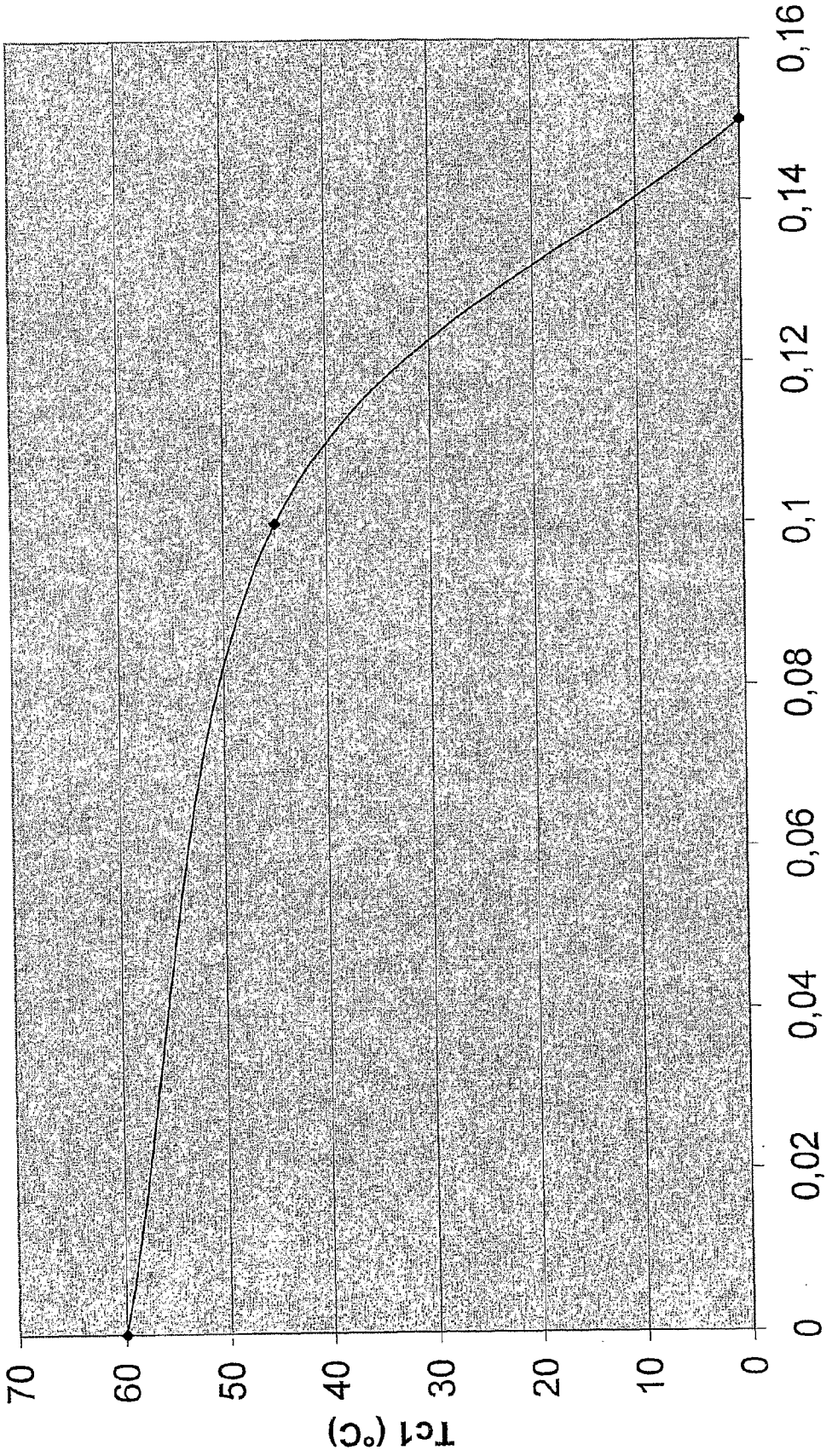


Fig. 3

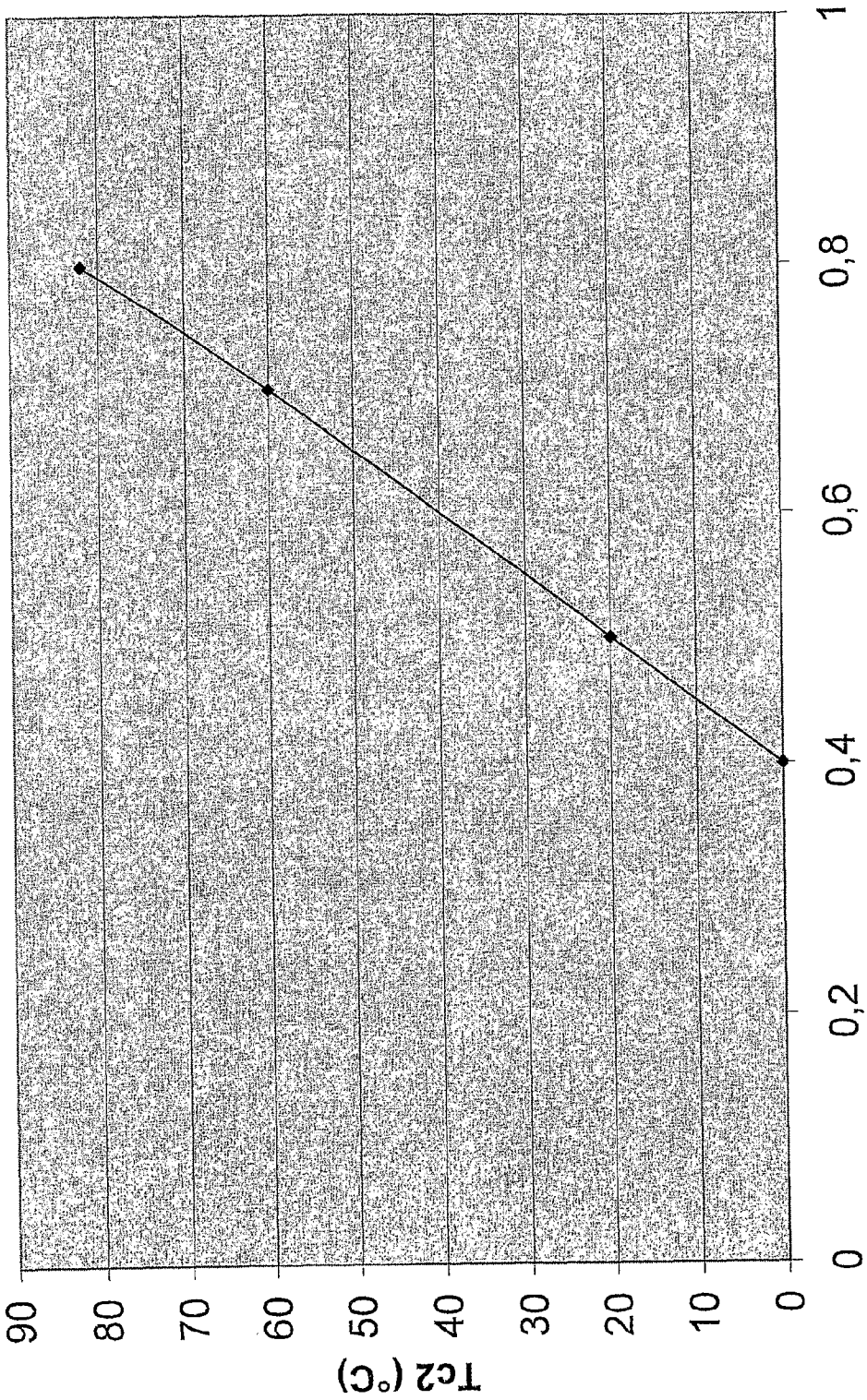


Fig. 4

APPLIANCE FOR PRODUCING HOT DRINKS

[0001] The present invention relates to an appliance for producing hot drinks such as, for example, coffee, tea, milk, chocolate, cappuccino, barley coffee, infusion.

[0002] Appliances for producing hot drinks known in the art typically comprise a water tank at atmospheric pressure, a boiler (or an instant hot water generator) for heating the water comprising an electrical resistance, a pump for feeding water from the tank to the boiler, a seat for containing the product for producing the drink and a duct for providing hot water under pressure from the boiler to the seat containing the product, so as to produce the hot water through the flow of hot water through the product contained into the seat.

[0003] The product may be, for example, in the form of loose powder, granules or small leaves or pre-packaged into suitable bags, wafers or capsules.

[0004] The boiler is typically associated with a temperature sensor for directly or indirectly sensing the temperature of water contained therein and control means adapted to switch on/switch off the electrical resistance based on the temperature detected by the temperature sensor so as to keep the water temperature into the boiler at a predefined temperature.

[0005] The Applicant has noted that the quality of hot drinks produced by known appliances is not constant and that, in general, it varies according to the operating condition of the appliance. In particular, the quality of the hot drink is typically worse when the appliance is switched on or when the appliance, even if kept on, is used for the production of a limited number of drinks, at relatively long time intervals. Quality, on the other hand, generally improves as the number of drinks subsequently produced, one after the other, increases.

[0006] The Applicant has thus faced the technical problem of providing an appliance which allows the quality of the hot drinks produced to be improved.

[0007] In particular, the Applicant has faced the technical problem of providing an appliance which allows a good quality to be obtained, irrespective of how the appliance is used.

[0008] The Applicant has perceived that this can be obtained by a suitable control of the temperature of the water that reaches the product.

[0009] In fact, the Applicant has noted that, in general, in order to optimise the quality of a hot drink, it is important to keep the temperature of hot water reaching the product and passing therethrough constantly within a well-defined optimal range of temperatures. This, for example, is especially important for oil-containing products, such as coffee, for which water temperatures above a certain maximum value (for example 95° C.) can "burn" the oils contained therein and, thereby, produce a bitterish taste of the drink while water temperatures below a certain minimum value (for example 90° C.) can produce a drink lacking in cream.

[0010] Moreover, the applicant has perceived that the temperature of the hot water that reaches the product does not depend only on the temperature of the water contained into the boiler (or in the instant hot water generator), but also on the temperature drop undergone by water while flowing along the water feeding duct from the boiler to the product. Such temperature drop varies, among the other things, according to the operating conditions of the appliance. In particular, the Applicant has noted that, upon the switching on of the appliance or when the appliance, even if kept on; is not used very much, the duct walls are relatively "cold" (e.g., at room temperature), so that the heated water that flows therethrough loses heat and reaches the product at a lower temperature than that of the water contained in the water heating device. In turn, when the appliance is used for producing a large number of coffee cups, one after the other, the duct walls heat up so that the heated water flowing therethrough before reaching the product undergoes a lower temperature drop and reaches the product at a temperature more or less equal to that of the water contained in the boiler. The above temperature drop, moreover, can vary on the basis of the climatic conditions of the outside environment that can also affect the temperature of the duct walls.

[0011] In this way, in conventional appliances, wherein the adjustment of the water temperature that reaches the product is carried out by a sensor adapted to measure the temperature of the water contained in the boiler, the temperature of water reaching the product changes according to the operating condition of the appliance and based on the climatic conditions of the outside environment.

[0012] Thus, in a first aspect thereof, the present invention refers to an appliance for producing hot drinks comprising

[0013] a water heating device comprising a heat source;

[0014] a seat adapted to receive a product for preparing the drink;

[0015] a duct for feeding hot water from the water heating device to the seat;

[0016] a temperature sensor associated with the water heating device;

[0017] control means operatively associated with the temperature sensor and to the heat source for adjusting the temperature of the water contained in the device by switching on/switching off the heat source based on the temperature detected by the temperature sensor;

characterised in that it comprises a second temperature sensor associated with the hot water feeding duct and in that the control means is adapted to adjust the temperature of the water contained in the device by switching on/switching off the heat source also based on the temperature detected by the second temperature sensor.

[0018] In the appliance of the invention, the control means is adapted to switch on and switch off the heat source and therefore, to adjust the temperature of the water contained in the water heating device based on the temperature detected by both the first sensor associated with the device and by the second sensor associated with the duct. This allows optimising the temperature of the water that reaches the product and, therefore, improving the quality of the hot drink.

[0019] In particular, the second sensor associated with the hot water feeding duct allows continuously controlling the duct temperature and adjusting the temperature of the water into the water heating device accordingly, based on the temperature drop undergone from time to time by the water flowing through the duct so as to keep the temperature of the water that reaches the product constantly within the values indicated for that product.

[0020] Advantageously, the control means is adapted to continuously control (e.g., every 0.1 or 0.01 s) the temperature detected by the first and by the second temperature sensor and, at each control, to determine an optimum temperature value at which the temperature detected by the first temperature sensor must be brought based on the temperature detected by the second sensor and to switch off/switch on the

heat source so that the temperature detected by the first sensor approaches the optimum temperature determined.

[0021] The above optimum temperature value is advantageously determined by a predefined algorithm that allows obtaining the value at which the temperature detected by the first sensor must be brought, based on the temperature detected by the second sensor, in order to obtain the desired temperature for the water that reaches a predetermined type of product.

[0022] Preferably, the appliance comprises selection means to allow the user to select a desired type of product among a plurality of products.

[0023] Advantageously, the control means is adapted to determine the optimum temperature value at which the temperature detected by the first sensor must be brought based on the temperature detected by the second sensor, according to the type of product selected by the user through said selection means.

[0024] Advantageously, the first sensor is arranged inside the water heating device. This advantageously allows directly detecting the temperature of the water contained in the device. Preferably, it is arranged inside the device, in the proximity of the water outlet towards the duct. This advantageously allows directly detecting the temperature of the water coming out of the device.

[0025] According to a variant, the first sensor is arranged on the outer wall of the water heating device.

[0026] Typically, the second sensor is arranged on the outer wall of the duct, at a predetermined point along the duct. In an embodiment, the appliance comprises at least one further temperature sensor associated with the duct, the second sensor and said at least one further sensor being arranged in different positions along the duct for detecting the temperature at two different positions of the duct. According to this embodiment, the control means is advantageously adapted to switch on/switch off the heat source also based on the temperature detected by said at least one further temperature sensor. As described is detail hereinafter in the description, the choice of using one or more sensors associated with the duct could depend on various factors, among which the duct length and the duct arrangement inside the appliance relative to the water heating device containing the heat source.

[0027] Typically, the water heating device is a boiler. According to a variant, it is an instant hot water generator.

[0028] According to an embodiment of the appliance, at least one portion of the duct is in contact with (or in close proximity of) the walls of the water heating device. This advantageously allows limiting the temperature drop phenomenon of the water flowing along the duct, since portion of the duct walls, being in contact with the device walls, heats up also in the absence of hot water flowing therein. Moreover, this embodiment also allows limiting the number of sensors to be associated with a duct.

[0029] According to a variant, at least one portion of the duct passes through the water heating device. Besides limiting the water temperature drop phenomenon along the duct and the number of sensors to be associated with the same, this variant allows arranging the seat below the water heating device and thus realising a more compact appliance.

[0030] Typically, the appliance also comprises an atmospheric-pressure water tank. Advantageously, the appliance also comprises a pump for feeding water from the tank to the water heating device at a predetermined pressure.

[0031] Typically, the appliance also comprises water flow adjusting means associated with the duct, adapted to block/allow the water flow towards the seat. Typically, said means comprises a solenoid valve.

[0032] In a second aspect thereof, the present invention relates to a method for adjusting the water temperature in an appliance for producing hot drinks, the appliance comprising a water heating device with a heat source, a seat for containing a product for preparing the drink and a duct for feeding the water from the water heating device to the product seat, the method comprising the steps of

[0033] a) switching the heat source on for heating the water contained into the water heating device;

[0034] b) detecting the temperature of the water contained into the water heating device;

[0035] c) adjusting the temperature of the water contained in the device by switching on/switching off the heat source based on the temperature detected in step b);

characterised in that it also comprises a step of d) detecting a temperature associated with at least one point of the water feeding duct and in that step c) is carried out also based on the temperature detected in step d).

[0036] In step b), the temperature of the water contained in the device is advantageously determined directly (for example, by a temperature sensor housed into the device, directly in contact with the water contained therein). According to a variant, it is determined indirectly (for example, by measuring the temperature of the device walls, through a temperature sensor applied to an outer wall of the device.

[0037] Advantageously, step d) is carried out by detecting the temperature of at least one point of an outer wall of the duct.

[0038] Advantageously, step c) comprises the steps of:

c1) continuously checking the temperature detected in steps d) and b) and, upon each check,

c2) determining an optimum temperature value at which the temperature of the water contained in the device must be brought, based on the temperature detected in step d),

c3) switching off/switching on the heat source according to the temperature detected in step b) so as to bring the temperature of the water contained in the device towards the optimum temperature value determined in step c2).

[0039] In step c2), the optimum temperature value is advantageously determined by a predefined algorithm that allows determining the value at which the temperature of the water contained in the device must be brought, based on the temperature detected in step d), in order to obtain the desired temperature for the water that reaches a predetermined product.

[0040] Further features and advantages of the present invention will appear more clearly from the following detailed description of a preferred embodiment, made with reference to the attached drawings. In such drawings,

[0041] FIG. **1** shows a schematic view of a first embodiment of an appliance according to the invention;

[0042] FIG. **2** shows a schematic view of a second embodiment of an appliance according to the invention;

[0043] FIG. **3** shows an example of the pattern of temperature Tc**1** measured by a first temperature sensor associated with the duct of an appliance according to the invention versus the parameter X**1** to be used in the algorithm for calculating the optimum temperature at which the water contained in the water heating device must be brought;

[0044] FIG. **4** shows an example of the pattern of temperature Tc**2** measured by a second temperature sensor associated with the duct of an appliance according to the invention versus the parameter X**2** to be used in the algorithm for calculating the optimum temperature at which the water contained in the water heating device must be brought.

[0045] FIG. **1** schematically describes an embodiment of an appliance **1** for producing hot drinks according to the invention comprising a tank **10** for containing water at atmospheric pressure, a water heating device **30** comprising a heat source **32**, a pump **20** for feeding water from tank **10** to device **30**, a seat **50** for containing a product for producing a hot drink, a duct **40** for feeding hot water from device **30** to seat **50**, a first sensor **31** associated with device **30**, a second sensor **41** associated with duct **40**, a solenoid valve **42**, selection means **70** and control means **60**.

[0046] Device **30** can, for example, be a conventional boiler of the stagnant water type or a conventional instant hot water generator wherein water does not stagnate and is heated by flowing, for example, along a labyrinth path.

[0047] Heat source **32** typically is an armoured electrical resistance of the conventional type.

[0048] Temperature sensors **31**, **41** are, for example, conventional negative temperature coefficient (NTC) probes.

[0049] In the illustrated embodiment, sensor **31** is housed into device **30** for directly detecting the temperature of the water contained in the device.

[0050] Sensor **41** is in contact with the outer wall of duct **40** at a point of the same duct **40** and is adapted to detect the duct temperature at that point.

[0051] Solenoid valve **42**, pump **20** and tank **10** are made according to conventional techniques well known in the art.

[0052] Solenoid valve **42** is adapted to block/allow the water flow along duct **40** towards seat **50**.

[0053] In case of a request of production of hot drink by the user, the control means **60** is adapted to activate pump **20** so that it pumps water from tank **10** to device **30** and to open solenoid valve **42** to allow the water flow, at a pressure determined by the thrust of pump **20**, towards seat **50**.

[0054] The hot water is produced thanks to the arrival of hot water at a predetermined temperature (for example 90° C.) and at a predetermined pressure on seat **50** and to the flow of hot water through the product contained in seat **50**. An infusion pressure originates at seat **50**, generated by the combination of two factors **1**) thrust of pump **20** and **2**) resistance offered by the product to the water flow through the same.

[0055] Device **30** advantageously comprises also a safety system (not shown) of the conventional type adapted to cut off the supply to the heat source **32** in the event of overheating of the same.

[0056] The appliance further comprises suitable indicator means (not shown) adapted to indicate to the user that the appliance is ready for use, once the optimum temperature for the water contained in device **30** is reached.

[0057] Appliance **1** can, for example, be used for producing a single hot drink, such as coffee, or more hot drinks such as coffee, tea, hot chocolate, infusions of various types, barley, hot milk, cappuccinos, milk with coffee, etc.

[0058] In this second case, appliance **1** advantageously comprises also the selection means **70** adapted to allow the user to select the desired type of hot drink, among the plurality of hot drinks that can be produced by appliance **1**.

[0059] The present invention can be used for implementing any appliance for producing hot drinks such as, for example, an espresso coffee maker for a typical household or bar use or an automatic dispenser of hot drinks for a typical company use, typically working with loose powder or granule products, or an appliance for making hot drinks working with products pre-packaged into suitable wafers, capsules or bags.

[0060] Seat **50** shall therefore be shaped and manufactured according to conventional techniques so as to house the products (loose or pre-packaged) intended to be used with the type of appliance considered.

[0061] For example, according to the type of appliance considered, seat **50** can be adapted to be removed from appliance **1** to allow the user to arrange the desired product therein such as, for example, in the case of some types of espresso coffee makers for household or bar use wherein the seat is provided with a grip and is adapted to be turned into two opposed directions by the user for allowing the removal/introduction. Or, seat **50** could be incorporated in appliance **1** and could be adapted to allow the user, according to techniques well known in the art, to introduce the pre-packaged wafer or capsule product therein (such as in the case of appliances for preparing hot drinks working with pre-packaged products) or it could be adapted to receive the loose product from special refillable containers housed into the appliance (such as in the case of automatic hot drink dispensers).

[0062] In the embodiment shown in FIG. **1**, duct **40** starts from device **30** to move away therefrom and ends in the proximity of seat **50**, arranged laterally to device **30**.

[0063] FIG. **2** shows an embodiment of appliance **1** which is totally similar to that shown in FIG. **1** except for the fact that seat **50** is arranged below device **30** and that duct **40**, which starts from device **30**, ends in the proximity of seat **50** passing inside device **30**. This embodiment is advantageous because it allows obtaining a more compactly shaped appliance. Moreover, it advantageously allows limiting the temperature drop phenomenon of the water flowing along the duct, since the walls of the portion of duct **40** inside appliance **30** heat up also in the absence of hot water flow therein.

[0064] Moreover, in the embodiment shown in FIG. **2**, there are two sensors **41** and **41***a* associated with the duct, one arranged inside solenoid valve **42** and the other on the end portion of duct **40**, in the proximity of seat **50**.

[0065] According to the present invention, the control means **60** is adapted to switch on/switch off the heat source **32** based on the temperature detected by sensors **31**, **41** (and, if present, **41***a*).

[0066] In the particular case of a single sensor **41** associated with duct **40**, as shown in FIG. **1**, the control means **60** is adapted to store a predefined algorithm [Td=f(Tc)] that allows determining from time to time the temperature value at which temperature Td detected by sensor **31** must be brought based on temperature Tc detected each time by sensor **41**, in order to obtain the optimum production temperature for the water that reaches the product that allows optimising the quality of the hot drink produced. That is, the algorithm is adapted to determine from time to time the optimum temperature value at which the temperature of the water contained in device **30** must be brought, based on the temperature detected from time to time on duct **40**.

[0067] Different products can have different optimum production temperatures. For example, for coffee, the optimum production temperature range is comprised between 90 and 92° C., for tea and other similar drinks between 80-85° C.

[0068] Thus, the above algorithm shall be defined based on the type of product considered. If appliance **1** shall produce a

plurality of hot drinks, the control means **60** shall be adapted to store a plurality of algorithms, one for each product or set of products having the same optimum production temperature range of the hot drink. The control means **60**, moreover, shall be adapted to use the appropriate algorithm according to the hot drink to be produced, for example selected by the user by the above selection means **70**.

[0069] Besides being defined based on the type of product considered, the above algorithm is defined also based on other factors that affect the sensitivity of sensor **41** and the temperature drop undergone by the water that flows through duct **40** such as the position of the second sensor **41** along duct **40**, the length of duct **40**, the diameter of duct **40**, the thickness of the walls of duct **40** and the arrangement of duct **40** inside appliance **1**.

[0070] For example, in fact, a long duct **40** implies a higher temperature drop of the water flowing therethrough compared to a short duct **40**, a duct **40** arranged outside and away from device **30** (as shown in FIG. **1**) implies a higher temperature drop compared to a duct **40** arranged in contact with the walls of device **30** or inside the same (as shown in FIG. **2**). Moreover, a sensor arranged toward the end of the duct allows detecting information on the temperature of water in the proximity of the product but can cause delays in the continuous adjustment of the water temperature due to thermal inertia. In turn, a sensor arranged at the beginning of duct **30** allows improving the continuous water temperature adjustment in terms of thermal inertia but does not directly detect information on the temperature of water in the proximity of the product.

[0071] Thus, according to the cases, it may be useful to provide for multiple sensors arranged in different positions of the duct itself in order to provide more information to the control means **60**.

[0072] In the exemplifying case of two sensors **41** and **41***a* (such as shown in FIG. **2**), the above algorithm shall be predefined so as to determine each time the temperature value Td at which the temperature detected by sensor **31** associated with device **30** must be brought based on temperature Tc**1**, Tc**2** detected from time to time by the two sensors **41** and **41***a* associated with the duct [Td=f(Tc**1**, Tc**2**)], in order to obtain the optimum production temperature for the water that reaches the product that allows optimising the quality of the hot drink produced.

[0073] For example, considering

[0074] a production of coffee with an optimum production temperature range comprised between 90 and 92° C.,

[0075] a 30 cm long duct having a first portion of Teflon, about 20 cm long and external to device **30** and a second portion of stainless steel, about 10 cm long and internal to device **30** (as shown for example in FIG. **2**), wherein the two duct portions both have outer diameter of 6 mm, inner diameter of 4 mm and a wall thickness of 1 mm;

[0076] a first sensor arranged inside solenoid valve **42** and a second sensor arranged on the end portion of duct **40** at a distance of about 1.5 cm from seat **50** (as shown for example in FIG. **2**),

the Applicant has experimentally determined that the optimum temperature Td at which water into device **30** must be brought based on temperature Tc**1** and Tc**2** respectively detected by the first **41** and second **41***a* sensor on the duct can be determined by the following algorithm:

$$Td=TM+[(X1*(TM-Tc1)+X2*(TM-Tc2)]$$

where TM is a constant that, in the case considered, is equal to 100° C. and X**1** and X**2** are corrective values that vary as temperatures Tc**1** and Tc**2**, respectively measured by the first **41** and by the second **41***a* sensor on the duct, vary.

[0077] The values taken by parameters X**1** and X**2** in the case under consideration, versus the temperature Tc**1** and Tc**2** detected by the first and by the second sensor are respectively indicated in the curves experimentally obtained by the Applicant shown in FIGS. **3** and **4**.

[0078] In the case under consideration, the control means **60** shall therefore be adapted to continuously read (for example every 0.1 or 0.01 s) the value of temperatures Tc**1** and Tc**2** detected by the two sensors associated with the duct, to determine the values of parameters X**1** and X**2** from the curves shown, to calculate the optimum temperature value Td through the above algorithm and to adjust the temperature value of the water contained in device **30** accordingly, by switching on/switching off the heat source **32**.

[0079] In general, as appliance **1** is switched on, the control means **60** is adapted to switch on the heat source **32** and to start, according to the invention, a continuous process of adjustment of the temperature of water contained in device **30** based on the temperature detected by the sensor/s associated with the duct.

[0080] According to such process, the control means **60** is adapted to check the temperature detected by the sensor/s associated with the duct and, upon each check carried out, to

[0081] determine, by the algorithm predefined for the hot drink to be produced, the optimum temperature value at which the water temperature into device **30** must be brought,

[0082] check the temperature detected by sensor **31** associated with device **30**,

[0083] switch on (keep on) the heat source **32** if the temperature detected by sensor **31** is lower than the optimum temperature value determined and switch off (keep off) the heat source **32** if the temperature detected by sensor **31** is higher than the optimum temperature value determined, in order to bring the temperature value of the water contained in device **30** close to the optimum temperature value determined.

[0084] Thus, at the switching on of the appliance **1** or when the appliance is on but is not used by the user or is little used at distant time intervals, when duct **30** (or at least the portion thereof external to device **30** and not in contact with the walls of device **30**) is "cold" (e.g., at room temperature) due to the absence or poor flow of hot water therein, water into device **30** is kept at a higher temperature that takes into account the higher temperature drop undergone by the water flowing through the "cold" duct **30**. In turn, in case of frequent use of the appliance, when the duct walls heat up thanks to the almost continuous flow of hot water therein, water in device **30** is kept at a lower temperature that takes into account the lower temperature drop undergone by the water flowing through the "hot" duct **30**.

[0085] As a consequence, thanks to a continuous adjustment of the water contained into device **30** based on the temperature continuously detected on duct **40**, the appliance **1** of the invention allows keeping the temperature of the water that reaches the product constantly within the optimum temperature range for that specific product.

[0086] This allows excellent quality hot drinks to be constantly obtained and hot drinks to be always produced almost

at the same temperature, irrespective of the operating conditions of the appliance and of the climatic conditions of the outside environment.

[0087] The Applicant notes that the appliance of the invention allows achieving these advantages without substantially affecting the cost of the same. In fact, compared to known appliances, it only requires the use of at least one further temperature sensor associated with the duct (which is a standard product available on the market at very low cost) and the use of control means (e.g., a microprocessor), already present in a conventional appliance, for implementing the adjustment of the water temperature according to the method of the invention.

[0088] The Applicant further notes that according to the type of appliance considered (for example, in the case of automatic hot drink dispensers and of espresso coffee makers for bars), the appliance of the invention can comprise a plurality of seats for producing a plurality of drinks and a single duct or multiple ducts for feeding water to the various seats.

[0089] In the case of multiple ducts, the appliance can comprise at least one temperature sensor associated with each duct, or with a portion thereof, and the control means shall be adapted to set the temperature of the water contained in the device based on the temperature detected by the temperature sensor associated with the duct that feeds the water to the seat from time to time used.

[0090] It is noted that in the case where one or more of such seats is used for producing a hot drink for which the production water temperature is not critical, the temperature of the water that reaches such seat/s could be adjusted by using only the temperature sensor **31** associated with the water heating device **30** and the use of one or more temperature sensors associated with the duct/s for feeding water to such seat/s could be avoided.

[0091] Moreover, the Applicant notes that according to the type of appliance considered, the appliance of the invention can comprise one or more ducts intended for the simple dispensing of hot water. Also in this case, where a fine adjustment of the temperature of the hot water dispensed is not required, the temperature adjustment could be carried out using only the temperature sensor **31** associated with the water heating device **30**, without the need of associating any temperature sensor to such duct/s.

[0092] On the other hand, in case of multiple seats and a single duct, a suitable number of temperature sensors to be associated with the single duct and a suitable arrangement of the various sensors therealong shall have to be provided, so as to be able to determine an optimum value to which the temperature of the water contained in the device should be brought which should allow obtaining, for the water that reaches each seat, the desired production temperature for a preselected product.

1. Appliance (**1**) for producing hot drinks comprising
a water heating device (**30**) comprising a heat source (**32**);
a seat (**50**) adapted to receive a product for preparing the drink;
a duct (**40**) for feeding hot water from the water heating device (**30**) to the seat (**50**);
a temperature sensor (**31**) associated with the water heating device (**30**);
control means (**60**) operatively associated with the temperature sensor (**31**) and with the heat source (**32**) for controlling the temperature of the water contained in the device (**30**) by switching on/switching off the heat source (**32**) based on the temperature detected by the temperature sensor (**31**);
characterised in that it also comprises a second temperature sensor (**41**) associated with the hot water feeding duct (**40**) and in that the control means (**60**) is adapted to control the temperature of the water contained in the device (**30**) by switching on/switching off the heat source (**32**) also based on the temperature detected by the second temperature sensor (**41**).

2. Appliance according to claim **1**, wherein the control means (**60**) is adapted to continuously control the temperature detected by the first (**31**) and by the second (**41**) temperature sensor and, at each control, to determine an optimum temperature value at which the temperature detected by the first temperature sensor (**31**) must be brought based on the temperature detected by the second sensor (**41**) and to switch off/switch on the heat source (**32**) so that the temperature detected by the first sensor (**31**) approaches the optimum temperature determined.

3. Appliance according to claim **2**, wherein the control means (**60**) is adapted to determine said optimum temperature value through a predefined algorithm that allows obtaining the value at which the temperature detected by the first sensor (**31**) must be brought, based on the temperature detected by the second sensor (**41**), in order to obtain the desired temperature for the water that reaches a predetermined type of product.

4. Appliance according to claim **3**, further comprising selection means (**70**) to allow the user to select a type of product among a plurality of products.

5. Appliance according to claim **4**, wherein the control means (**60**) is adapted to determine said optimum temperature value at which the temperature detected by the first sensor (**31**) must be brought based on the temperature detected by the second sensor (**41**), according to the type of product selected by the user by means of the selection means (**70**).

6. Appliance according to any of claims **1** to **5**, comprising at least one further temperature sensor (**41***a*) associated with the duct, the second sensor (**41**) and said at least one further sensor (**41***a*) being arranged in different positions along the duct (**40**) for detecting the temperature at two different positions of the duct (**40**).

7. Appliance according to claim **6**, wherein the control means (**60**) is adapted to adjust the temperature of the water contained in the device (**30**) by switching on/switching off the heat source (**32**) also based on the temperature detected by said at least one further temperature sensor (**41***a*).

8. Appliance according to any of claims **1** to **7**, wherein at least one portion of the duct (**40**) is in contact with the walls of the water heating device (**30**).

9. Appliance according to any of claims **1** to **7**, wherein at least one portion of the duct (**40**) passes through the water heating device (**30**).

10. Appliance according to any of claims **1** to **9**, further comprising a water tank (**10**) at atmospheric pressure.

11. Appliance according to claim **10**, further comprising a pump (**20**) for feeding water from the tank (**10**) to the water heating device (**30**) at a predetermined pressure.

12. Method for adjusting the water temperature in an appliance (**1**) for producing hot drinks, the appliance (**1**) comprising a water heating device (**30**) with a heat source (**32**), a seat (**50**) for containing a product for preparing the drink and a

duct (**40**) for feeding the water from the device (**30**) to the seat (**50**), the method comprising the steps of

a) switching the heat source (**32**) on for heating the water contained into the water heating device (**30**);

b) detecting the temperature of the water contained into the water heating device (**30**);

c) adjusting the temperature of the water contained in the device (**30**) by switching on/switching off the heat source (**32**) based on the temperature detected in step b);

characterised in that it also comprises a step of d) detecting a temperature associated with at least one point of the water feeding duct (**40**) and in that step c) is carried out also based on the temperature detected in step d).

13. Method according to claim **12**, wherein step c) comprises the steps of:

c1) continuously checking the temperature detected in steps d) and b) and, upon each check,

c2) determining an optimum temperature value at which the temperature of the water contained in the device (**30**) must be brought, based on the temperature detected in step d),

c3) switching off/switching on the heat source (**32**) according to the temperature detected in step b) so as to bring the temperature of the water contained in the device (**30**) towards the optimum temperature value determined in step c2).

14. Method according to claim **13**, wherein in step c2), the optimum temperature value is determined by a predefined algorithm that allows determining the value at which the temperature of the water contained in the device (**30**) must be brought, based on the temperature detected in step d), in order to obtain the desired temperature for the water that reaches a predetermined type of product.

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