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(54) **APPARATUS FOR HEATING WATER AND DISPENSING HOT WATER AND/ OR BOILING WATER**

VORRICHTUNG ZUR WASSERERHITZUNG UND AUSGABE VON HEISSWASSER UND/ODER KOCHENDEM WASSER

APPAREIL POUR CHAUFFER L'EAU ET DISPENSER DE L'EAU CHAUDE ET/ OU BOUILLANTE

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EP 2 443 397 B1

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Description

[0001] The present invention relates to an apparatus for heating water and dispensing hot water and/or boiling water, e.g. for use in a domestic kitchen.

[0002] A known apparatus comprises a water mains pipe connector for connecting the apparatus to a water mains pipe, and a water storage and heating reservoir. The reservoir has a bottom, a top, and an inlet connected to the water mains pipe connector for letting fresh water into the reservoir. The inlet is provided at the bottom portion of the reservoir. The reservoir furthermore has a water outlet provided at the upper portion of the reservoir, which is connectable to a tap. An electric water heating element is provided in the lower region of the water reservoir above the inlet to heat the water.

[0003] Such an apparatus is known from US6073539 and ES2298246.

[0004] It is an object of the present invention to provide an improved apparatus of this type.

[0005] The invention relates to the operation of the apparatus, in particular when boiling water is allowed to flow through the boiling water tap. In a known apparatus for dispensing boiling water boiling water is allowed to flow through the boiling water tap upon operation of a switch.

[0006] According to the invention an apparatus as in claim 1 is provided. Herewith a safe operation of the apparatus is possible, as a security code defines whether or not boiling water is allowed to flow through the boiling water tap. For example, such a security code is defined by a combination of sequence and time of operating the switch. In a preferred embodiment, the user of the apparatus defines the security code.

[0007] In an exemplary example, the operating module comprises an electronic module defining the following security code: one short press on the switch, followed by pressing the switch over 0,5 seconds allows the flow of boiling water. This security code prevents the flow of boiling water when the user or children play with the switch. An alternative security code can be two short presses on the switch, followed by pressing the switch over 0,5 seconds to allow the flow of boiling water. Yet an alternative, less safe security code can be pressing the switch for over 0,5 seconds.

[0008] Preferably the electronic module of the operating module is programmed such that when boiling water is allowed to flow, only a small amount of water is allowed to flow. The electronic module may be programmed such that when the switch is pressed for over 10 seconds, the flow of boiling water is continuous. The flow of boiling water may be stopped by a short press on the switch, or alternatively after 3 minutes. Then an amount of 6 to 7 litres of boiling water may have flown though the boiling water tap.

[0009] In yet another preferred embodiment, when the electronic module is set such that when boiling water is allowed to flow, only a small amount of water is allowed to flow, the electronic module is programmed such that when the switch is pressed within 2 seconds after the flow has ended, a small amount of boiling water is allowed to flow without re-entering the security code.

[0010] The invention will now be explained in more detail with reference to the drawings.

[0011] In the drawings:

Fig. 1 shows in side view a preferred embodiment of the reservoir of the apparatus,
Fig. 2 shows the reservoir from above,
Fig. 3 shows the reservoir from below,
Fig. 4 shows the reservoir in perspective view,
Fig. 5 shows the reservoir in perspective view from another angle,
Fig. 6 shows the bottom portion of the reservoir in exploded view,
Fig. 7 shows the bottom portion in side view,
Fig. 8 shows the bottom portion in top view,
Fig. 9 shows the upper portion in perspective view,
Fig. 10 shows the upper portion in cross-section,
Fig. 11 shows the flow of water in the reservoir,
Fig. 12 shows a schematic layout of an apparatus according to an embodiment of the apparatus of the invention,
Fig. 13 shows a schematic layout of an apparatus according to a second embodiment of the apparatus of the invention,
Fig. 14 shows an exploded view of the main components of a preferred embodiment of the apparatus of the invention,
Fig. 15 shows a schematic layout of an apparatus according to a second embodiment of the apparatus of the invention,
Figs. 16a, b and c show a schematic layout of a hot water tap according to the invention.

[0012] With reference to the figures 1-11 now a preferred embodiment of the reservoir of the apparatus will be explained.

[0013] The reservoir discussed here can be integrated in an apparatus specifically adapted for providing boiling water only, e.g. to be dispensed via a water boiling tap arranged at the kitchen sink, but can also be integrated in an apparatus that not only provides boiling water but also hot water, e.g. to be supplied to a further hot and cold water tap arranged at the kitchen sink.

[0014] The apparatus comprises a water mains pipe connector for connecting the apparatus to a water mains pipe (not shown in figures 1-11).

[0015] The apparatus further comprises a water storage and heating reservoir 1. The apparatus has an outer housing wherein the reservoir 1 is mounted, the housing being adapted to be mounted (e.g. in a kitchen cabinet) with the reservoir 1 in vertical position.

[0016] The reservoir 1 has a bottom 2 and a top 3. The reservoir 1 has an inlet 4 connected via a pipe to the water mains pipe connector. The inlet 4 is provided at the bottom portion of the reservoir 1.

[0017] The reservoir 1 furthermore has a water outlet 5 provided at the upper portion of the reservoir 1, which is connectable to one or more taps as will be explained in more detail below.

[0018] An electric water heating element 10 is provided in the lower portion of the water reservoir 1 above the inlet 4.

[0019] As can be seen the electric water heating element 10 is of a substantially horizontal lay-out. Its body is generally planar and extends in a horizontal plane, so at right angles to the main vertical axis of the reservoir 1.

[0020] The heating element 10 is of a substantially spiralling construction, the coils of the spiral being located in a common horizontal plane.

[0021] The coils of the heating element 10 are preferably made of Incoloy or stainless steel.

[0022] As can be observed in figure 8 - and as is preferred in view of circulation of the water in the reservoir - the heating element 10 is positioned eccentrically with respect to the central vertical axis of the reservoir 1.

[0023] The reservoir 1 has a substantially circular horizontal cross-section, as is preferred.

[0024] As is preferred the spiral heating element 10 has a generally circular outer contour with a radius R, and the centre of the spiral heating element is positioned between 0.4 R and 0.6 R eccentric from the centre of the reservoir 1.

[0025] To allow for optimum water circulation in the reservoir 1 it is preferred that the ratio between the effective horizontal surface of the heating element 10 and the remaining horizontal surface area of the reservoir 1 at the height of the heating element 10 is between 1 : 0.75 and 1 : 1.25. In figure 11 it can be observed that heated water rises in the reservoir 1, generally in the region above the heating element 10, the remainder of the cross-section of the reservoir 10 being available for a downward return flow of water.

[0026] As is preferred the reservoir 1 is made of steel, e.g. stainless steel.

[0027] As is preferred the reservoir 1 is composed of a top element 3a, a bottom element 2a and a tubular central element 1 a, preferably welded together, the reservoir effectively being closed apart from the inlet 4 and outlet 5.

[0028] The water heating element 10 is mounted here in the bottom element 2a, preferably such that the top of the heating element 10 is level with the top of the bottom element 2a of the reservoir. This facilitates to assembly of the reservoir 1.

[0029] As is preferred the inlet 4 of the reservoir 1 is associated with a water inlet distributor 4a arranged below the heating element 10 and having one or more water distributing openings allowing the inflow of water in a generally radial direction into the reservoir 1.

[0030] Figure 12 depicts a schematic flow scheme of an apparatus according to an embodiment of the invention and an associated boiling water tap.

[0031] As is preferred this apparatus of figure 12 is designed solely for dispensing boiling water, preferably for use with a boiling water tap, e.g. mounted at a kitchen sink.

[0032] The apparatus comprises a pressure vessel reservoir 101 having a cold water inlet 102 at the bottom end thereof that is connected to a water mains pipe connector 113 via a pipe 112. The reservoir also has an outlet 103 provided at an upper portion of the vessel 101. The reservoir 101 is preferably embodied as discussed with reference to figures 1-11, e.g. including one or more of the preferred features thereof.

[0033] In normal operation the reservoir 101 is completely filled with water. The water in the reservoir 101 is preferably heated to a temperature above the atmospheric boiling point of water, e.g. to 110 - 106 °C. Due to this relative low overheated water the steam production reaching atmospheric pressure is reduced. For example, when the temperature is 115 °C, per litre water one litre of steam is formed after expansion. At 105°C, this is only 30%. In other words, steam formation reduces a factor 3.

[0034] As is preferred inside the pressure vessel reservoir 101 an outlet pipe element 109 is provided that is connected to the outlet 103, which pipe element 109 here is of a U-shape and bends upwards towards the top of the pressure vessel 101.

[0035] As is preferred the inlet 102 is connected to a water inlet distributor 108 in the reservoir 101 below the heating element 104. In another embodiment an inlet distributor is arranged above the mouth of the inlet 102 to direct the inflow of water in a substantially horizontal direction.

[0036] In the figure 12 it is shown that the outlet 103 of the reservoir is connected to a boiling water tap 150 via a pipe 110, 111.

[0037] The tap 150, which can be sold to the customer together with the apparatus, here, as is preferred, includes an electrical switch 151 or similar, e.g. a touch type switch, for operation by a user in order to activate the flow of boiling water. This switch 151 is connected via an electrical line (or e.g. wireless) to an electrically operated valve assembly 140,141 with one or more valves in the pipe 110,111. The switch 151 is also visible in fig. 16a.

[0038] In the preferred embodiment shown here, in the pipe 110,111 between the reservoir 101 and the boiling water tap 150 multiple, here two, valves 140, 141, e.g. electromagnetic valves, are provided in parallel.

[0039] The parallel valves 140, 141 allow a user of the tap 150 to choose between two volumetric flows depending on the application. For instance, if a small volumetric flow is required, e.g. to fill a cup, only one of the valves is opened, but in case a larger volume flow is required, e.g. to fill a tea kettle or cooking pan, both valves are opened.

[0040] In a preferred embodiment the apparatus includes control electronics for the parallel valves 140, 141 in the boiling water pipe 110,111 such that first operation of the switch on the tap 150 cause one valve 140 to open,

and such that the second valve 141 also opens when the switch is operated beyond a predetermined time, e.g. after operating, e.g. depressing, the switch for more than 10 seconds.

[0041] As is preferred in the boiling water pipe 110, 111 leading to the tap 150, outside of the reservoir 101, a filter 142, preferably exchangeable, is provided to filter the boiling water. The advantage of providing this filter 142 outside the pressure vessel reservoir 101 is that the filter 142 can be easily replaced by a non-technically skilled person.

[0042] As is preferred the temperature of the water in the pressure vessel reservoir 101 is measured using two vertically spaced temperature sensors 106,107. The one sensor 106 is located at or near the heating element 104, whereas the other sensor 107 is located at the upper part of the reservoir 101, near the reservoir outlet.

[0043] As can be seen in the reservoir 1 of figures 1-11, and now will be explained with reference to figure 12, a wall portion 148 of the reservoir 101 is extending into the interior of the reservoir as a tube from the bottom to the heating element 104. As is preferred this tubular wall portion 148 extends upwards to a point above the water heating element 104. A temperature sensor 106 is positioned inside the tubular wall portion 148 to measure a water temperature in the vessel 101 just above the heating element 104. The tubular wall portion 148 may be a tube with one open end and one closed end, said closed end being inserted through an opening of the reservoir 101 and then attaching the open end to the wall of the reservoir by for instance welding.

[0044] A second temperature sensor 107 is mounted in this embodiment to the outside of the wall of the reservoir 101 to measure a water temperature in the reservoir at the top.

[0045] The electric water heating element 104 is controlled by an electronic control system 155 on the basis of the one or more temperature sensors 106, 107, preferably with a suitable thermostat.

[0046] A problem that may arise in particular with boiling water taps used in combination with an apparatus for providing hot or boiling water, is that of calcification of the tap. In order to alleviate this problem the tap outlet for boiling water and/or the tap outlet for hot water comprises a polymer spout, such as spout 252 shown in fig. 16b, preferably made of POM or Teflon, to prevent calcification, having holes of preferably 1,5 - 3 ,0 mm in diameter. Preferably the polymer spout has 5-15, preferably 7-10 holes. The advantage of this spout is that the boiling hot water is divided in little droplets. This reduces the risk of instant burning of hands when held under the water flow substantially.

[0047] In figure 13 a more elaborate version of the apparatus according to the invention is shown schematically. This apparatus not only produces boiling water to be dispensed from boiling water tap 150, but also produces non-boiling hot water to be supplied to a tap 160, e.g. a hot and cold water tap that allows a user to set and adjust the temperature and flow of the dispensed non-boiling water.

[0048] In figure 13 parts that are the same or similar to parts in figure 12 have been denoted with the same reference numerals. The additional parts will be explained below in more detail.

[0049] Reference numeral 129 denotes a boiling water valve in the pipe 110 of the apparatus, in this example electronically controlled via signal line 152 connected to switch 151 of tap 150.

[0050] As is preferred a flow regulator 130 is mounted in boiling water pipe 110, e.g. an adjustable regulator that is set upon installation of the apparatus to obtain a desired boiling water flow, e.g. to compensate for water mains pressure. Preferably, the flow restrictor or flow regulator (130) will keep the flow constant between 1 and 3 l/min, independent of the water pressure. The position of flow regulator 130 is also shown in detail in fig. 16c.

[0051] The outlet 103 not only connects to tap 150 but also to a thermostatic mixing valve 116, preferably a valve with a user adjustable output temperature of the water emerging from the valve 116, e.g. having a knob at the front of the apparatus.

[0052] In this embodiment, as is preferred, only a single water outlet 103 is formed in the reservoir 101, a T-branch 114 being provided downstream of the outlet 103 that connects to a pipe 115 to feed water from reservoir 101 to the mixing valve 116.

[0053] A cold water pipe 121 also connects to the mixing valve 116, the mixing valve 116 being connected to an hot water pipe 120.

[0054] As is preferred non-return valves 114, 118, 119 are provided at each port of the mixing valve 116 to prevent undesirable backflow of water.

[0055] In this example the hot water pipe 120 is connected via hose 128 to the hot water connection of tap 160. The tap 160 also includes a cold water connection connected to the water mains via a pipe 198.

[0056] As is preferred a safety pressure valve 122 is arranged in cold water inlet pipe 113, allowing to relief an undesirable overpressure, e.g. into a waste pipe 125.

[0057] The apparatus, as is preferred, also includes a cold water connector 124 to which pipe 198 is connected, so that both the hot water and cold water connection of the tap 160 can be connected to associated connectors on the apparatus. This facilitates the installation of the apparatus and taps.

[0058] The water mains pipe connection of the apparatus is preferably embodied as a hose 126, connecting to pipe 123.

[0059] In a preferred embodiment the mixing device 116 comprises a thermostatic mixing valve, which preferably comprises a brass interior, preferably provided with a Teflon tube positioned in the brass interior to prevent calcification.

[0060] In a preferred embodiment a cold water inlet combination is provided that is connected to the water mains pipe connector and to the water reservoir inlet and

the mixing device, which cold water inlet combination is preferably provided with a filter 282. The filter 182 can be filled with active carbon 180 to filter elements that influence taste of the water. Instead of an active carbon filter, or in addition to an active carbon filter, also a filter 181 can be provided on base of ion exchange to soften the water in hard water area's.

[0061] In a preferred embodiment the apparatus comprises a temperature control connected to the heating element to control the temperature of the heating element and thus the temperature of the water in the water reservoir, preferably maintaining the boiling water at a temperature of 101-106°C.

[0062] It will be appreciated that reservoir 101 is preferably embodied as described herein before with reference to figures 1-11. Also details of the reservoir and related features discussed with reference to figure 11 and/or 12 are preferably incorporated in the reservoir and apparatus of figures 1-11.

[0063] Now referring to figure 14 other aspects and preferred details of the invention will be elucidated in more detail.

[0064] In figure 14 parts corresponding to figure 12 have been denoted with the same reference numeral.

[0065] As is preferred a cylindrical insulator 170 is mounted around the reservoir 101 to avoid heat loss.

[0066] The apparatus includes an outer housing, here with a front part 180a and a rear part 180b, preferably both made of plastic material.

[0067] The outer housing is adapted to be mounted, e.g. in a kitchen cabinet, preferably below the kitchen sink, with the reservoir 101 in vertical position.

[0068] As is preferred the reservoir 101 is supported in the outer housing by a reservoir support member 182 mounted in the outer housing, the reservoir support member 182 engaging and supporting the bottom portion of the reservoir 101. As is preferred the reservoir support member 182 here comprises a central depression or opening 182a in which the bottom portion of the reservoir 101 is received.

[0069] As is preferred the reservoir support member 182 here is made as a moulded, e.g. injection moulded, plastic product.

[0070] The support member 182 preferably not only serves to support the reservoir 101, but when an electric heater is used, as is preferred, then it is also preferred that electrical components associated with said electric heater are mounted on the reservoir support member 182. These components preferably at least include a temperature sensor (here sensor 106) for measuring a water temperature in the reservoir, preferably near or just above the heater, and an electrical thermostat 106b coupled to said temperature sensor for controlling the electric heater.

[0071] As is preferred the support member 182 also includes a electric mains connector, e.g. with electric cable 184, as well as an electric cable 185 to connect to a boiling water tap (150).

[0072] As is preferred the apparatus comprises an assembly of one or more valves, here including mixing valve 116, and associated water conduits, in this example both flexible and non-flexible. The apparatus here comprises an upper support member 190 mounted above the reservoir 101, said upper support member 190 supporting the one or more valves, as is preferred at least mixing valve 116 when present in the apparatus.

[0073] As can be seen, in this preferred embodiment, the upper support member 190 is substantially plate-shaped. The mixing valve 116 is resting on top of said upper support member 190, as is preferred in a depression 190a formed in the upper support member.

[0074] The mixing valve 116 is a thermostatic valve and has a temperature adjust knob to adjust the temperature of the hot water, e.g. between 50 and 70 °C. The knob is accessible at the front of the apparatus.

[0075] A cover member 191 is mounted over the upper support member.

[0076] In a version of the apparatus, e.g. as shown in figure 13, shown in figure 15, a heat exchanger 200 is arranged between the pipe 115 connecting the reservoir outlet 103 to the mixing valve 116 on the one hand and the pipe 112 connecting the water mains pipe connector to the water inlet 102 on the other hand, such that water from the reservoir 101 to the mixing valve 116 is cooled, preferably to below 100 °C, and the heat is transferred to the water flowing to the inlet 102 without water being mixed in the heat exchanger. It will be appreciated that this solution is most advantageous when the mixing valve 116 is housed within the outer housing of the apparatus, so that also said heat exchanger can be fitted within said outer housing too.

[0077] In fig. 16c a set of spring operable balls 270 is shown which allow stepwise height adjustment of the tap 271. This type of height adjustment is applicable in any type of tap, preferably a hot water tap, more preferably a hot water tap suitable to be used in an apparatus according to the present invention.

Claims

1. Apparatus for dispensing boiling water and for dispensing hot water, connectable to the water mains, e.g. for use in a domestic kitchen, the apparatus comprising:

    - a water mains pipe connector (113) for connecting the apparatus to a water mains pipe,
    - a water storage and heating reservoir (101), said reservoir (101) having a bottom and a top, wherein said reservoir (101) has an inlet (102) connected to the water mains pipe connector (113), the inlet (102) being provided at the bottom portion of the reservoir (101), wherein the reservoir (101) furthermore has an outlet (103) provided at the upper portion of the reservoir

(101), which is connectable to a tap, and wherein a water heating element (104) is provided in the water reservoir (101), the heating element (104) being adapted to provide boiling water at a temperature above its atmospheric boiling point,
- a boiling water outlet (110) connected to the reservoir outlet (103) via a boiling water pipe and connectable to a boiling water tap (150);
- preferably a mixing device (116) connected to the water mains pipe connector (113) and to the reservoir outlet (103), said mixing device (116) being adapted to mix cold water and water from the reservoir (101) to provide hot water to a hot water outlet of the apparatus, said hot water outlet being distinct from the boiling water outlet (110),
- preferably the apparatus including a cold water outlet, thereby allowing a tap to be connected to the hot water outlet and the cold water outlet of the apparatus,

characterized in that an operating module (140, 141, 151) for operating the boiling water tap (150) by enabling or denying boiling water to flow through the boiling water tap (150) is provided in the boiling water pipe, which operating module (140,141,151) comprises a switch (151) and an electronic module (141, 142), which electronic module (141, 142) defines a security code which enables or denies boiling water to flow through the boiling water tap (150), and wherein the security code is defined by a combination of sequence and time of operating the switch (151).

2. Apparatus according to claim 1, wherein the security code is definable by the user of the apparatus.

Patentansprüche

1. Apparat zum Ausgeben von Kochwasser und zum Ausgeben von Heißwasser, welcher mit der Wasserversorgung verbindbar ist, z. B. zur Verwendung in einer Haushaltsküche, wobei der Apparat Folgendes umfasst:

- ein Wasserversorgungsleitungsanschlussteil (113) zum Verbinden des Apparats mit einer Wasserversorgungsleitung;
- ein Wasserspeicher- und Erhitzungsreservoir (101), wobei das Reservoir (101) einen Boden und eine Decke hat und es einen Einlass (102) hat, der mit dem Wasserversorgungsleitungsanschlussteil (113) verbunden und an dem Bodenteil des Reservoirs (101) bereitgestellt ist, wobei das Reservoir (101) ferner einen Auslass (103) hat, der an dem oberen Teil des Reservoirs (101) bereitgestellt und mit einem Hahn verbindbar ist, und wobei ein Wassererhitzungselement (104) in dem Wasserreservoir (101) bereitgestellt ist, wobei das Erhitzungselement (104) geeignet ist, um Kochwasser mit einer Temperatur über seinem atmosphärischen Siedepunkt bereitzustellen;
- einen Kochwasserauslass (110), der mit dem Reservoirauslass (103) über eine Kochwasserleitung verbunden und mit einem Kochwasserhahn (150) verbindbar ist;
- vorzugsweise eine Mischvorrichtung (116), die mit dem Wasserversorgungsleitungsanschlussteil (113) und mit dem Reservoir-auslass (103) verbunden ist, wobei die Mischvorrichtung (116) zum Mischen von Kaltwasser und Wasser aus dem Reservoir (101) geeignet ist, um einem Heißwasserauslass des Apparats Heißwasser bereit zu stellen, wobei der Heißwasserauslass von dem Kochwasserauslass (110) verschieden ist; und
- wobei der Apparat vorzugsweise einen Kaltwasserauslass umfasst, wodurch es möglich ist, einen Hahn mit dem Heißwasserauslass und dem Kaltwasserauslass des Apparats zu verbinden, und der Apparat **dadurch gekennzeichnet ist, dass** ein Bedienmodul (140, 141, 151) zum Bedienen des Kochwasserhahns (150) in der Kochwasserleitung bereitgestellt ist, indem dem Kochwasser erlaubt oder verweigert wird durch den Kochwasserhahn (150) zu fließen, wobei das Bedienmodul (140, 141, 151) einen Schalter (151) und ein elektronisches Modul (141, 142) umfasst, wobei das elektronische Modul (141, 142) einen Sicherheitscode definiert, der es dem Kochwasser ermöglicht oder verweigert durch den Kochwasserhahn (150) zu fließen, und wobei der Sicherheitscode durch eine Kombination aus Reihenfolge und Zeit der Bedienung des Schalters (151) definiert wird.

2. Apparat nach Anspruch 1, wobei der Sicherheitscode durch den Benutzer des Apparats definierbar ist.

Revendications

1. Dispositif de distribution d'eau bouillante et de distribution d'eau chaude, connectable au réseau d'eau, pour être utilisé par exemple dans une cuisine domestique, le dispositif comprenant :

- un connecteur de tuyau d'alimentation en eau (113) pour connecter le dispositif à un tuyau d'alimentation en eau,
- un réservoir de stockage et de chauffage d'eau (101), ledit réservoir (101) ayant une partie inférieure et une partie supérieure, dans lequel

ledit réservoir (101) a une entrée (102) connectée au connecteur de tuyau d'alimentation en eau (113), l'entrée (102) étant prévue au niveau de la partie inférieure du réservoir (101), dans lequel le réservoir (101) a en outre une sortie (103) prévue au niveau de la partie supérieure du réservoir (101), qui peut être reliée à un robinet, et dans lequel un élément de chauffage d'eau (104) est prévu dans le réservoir d'eau (101), l'élément de chauffage (104) étant adapté pour fournir de l'eau bouillante à une température supérieure à son point d'ébullition atmosphérique,

- une sortie d'eau bouillante (110) reliée à la sortie de réservoir (103) par le biais d'un tuyau d'eau bouillante et pouvant être reliée à un robinet d'eau bouillante (150) ;
- de préférence un dispositif mélangeur (116) raccordé au connecteur de tuyau d'alimentation en eau (113) et à la sortie de réservoir (103), ledit dispositif mélangeur (116) étant adapté pour mélanger l'eau froide et l'eau provenant du réservoir (101) pour fournir de l'eau chaude à une sortie d'eau chaude du dispositif, ladite sortie d'eau chaude étant distincte de la sortie d'eau bouillante (110),
- de préférence, le dispositif comporte une sortie d'eau froide, ce qui permet de raccorder un robinet à la sortie d'eau chaude et à la sortie d'eau froide du dispositif, **caractérisé en ce qu'**un module de commande (140, 141, 151), pour faire fonctionner le robinet d'eau bouillante (150) en permettant ou interdisant à l'eau bouillante de circuler à travers le robinet d'eau bouillante (150), est prévu dans le tuyau d'eau bouillante, lequel module de commande (140, 141, 151) comprend un commutateur (151) et un module électronique (141, 142), lequel module électronique (141, 142) définit un code de sécurité qui permet ou interdit à l'eau bouillante de circuler à travers le robinet d'eau bouillante (150), et dans lequel le code de sécurité est défini par une combinaison de séquence et de temps de fonctionnement du commutateur (151).

2. Dispositif selon la revendication 1, dans lequel le code de sécurité est définissable par l'utilisateur du dispositif.

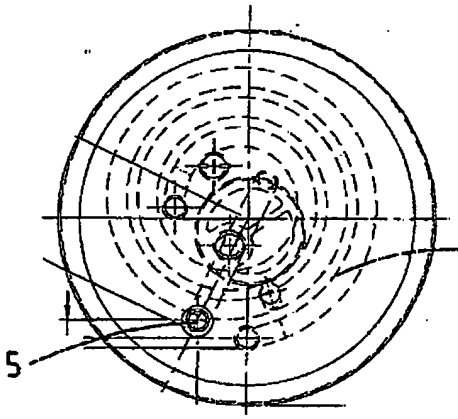


Fig.2

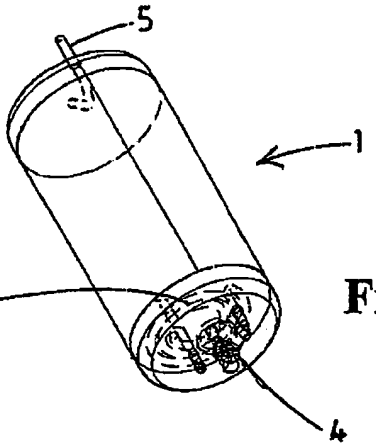


Fig.4

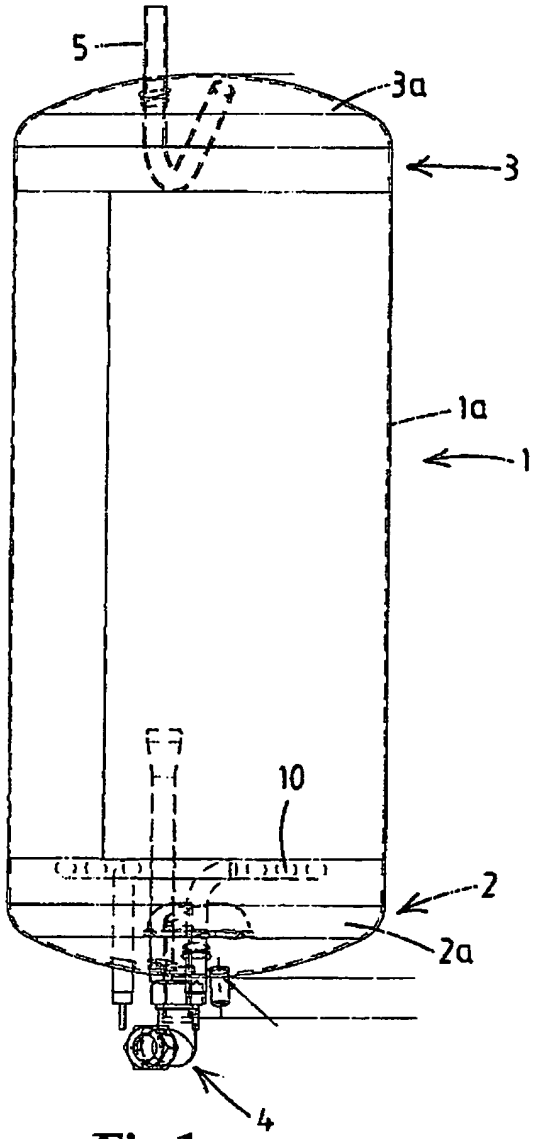
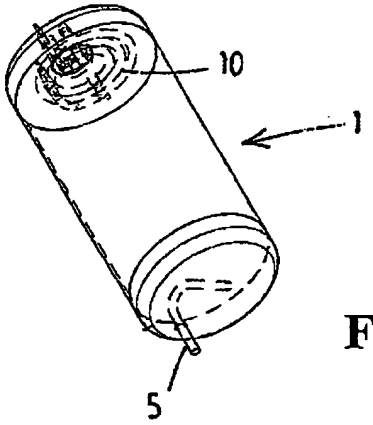


Fig.1



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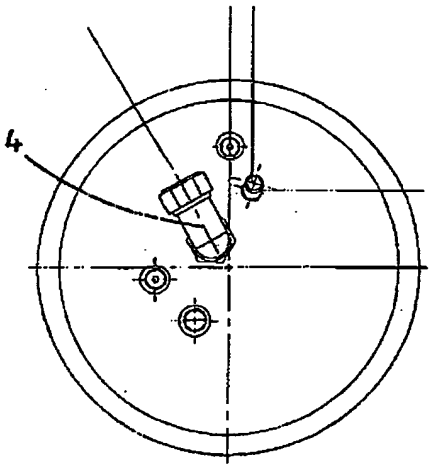

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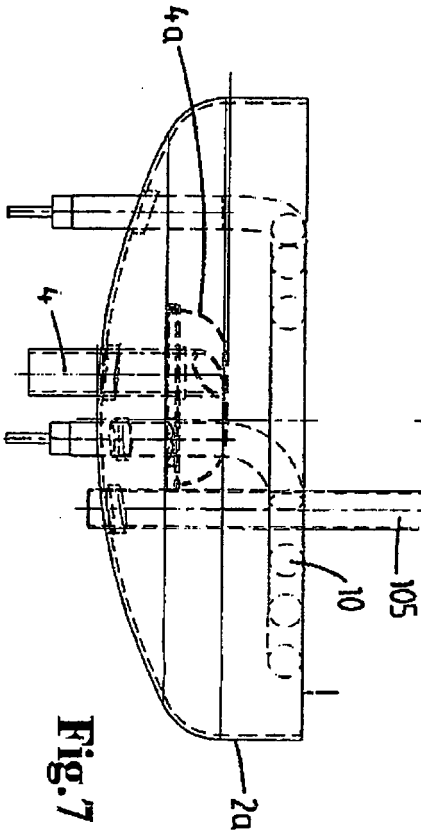

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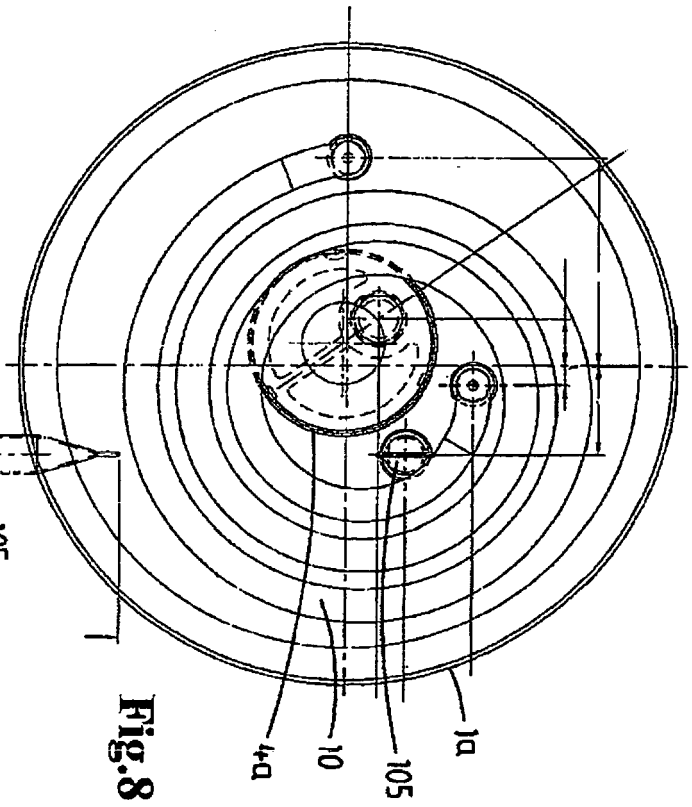
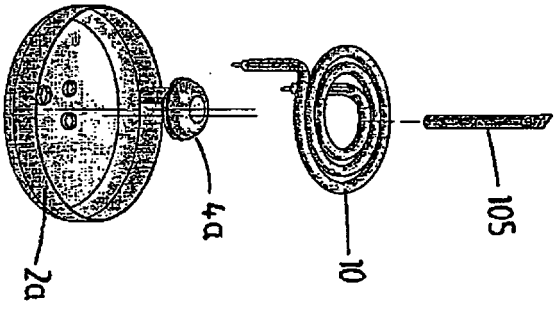


Fig.8



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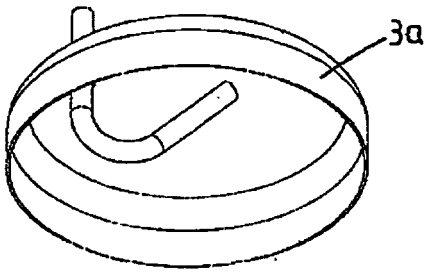

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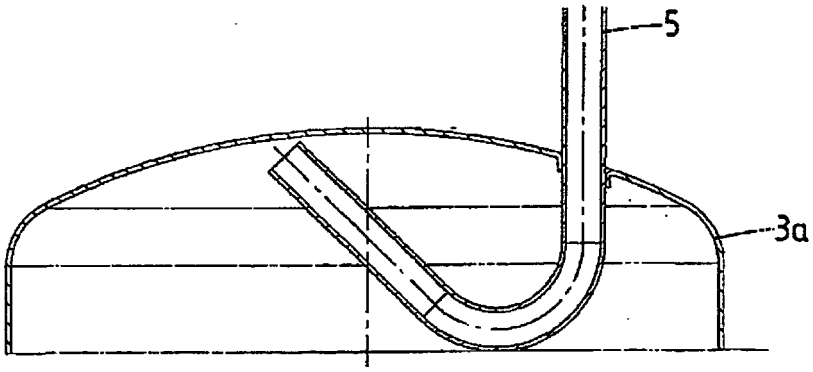

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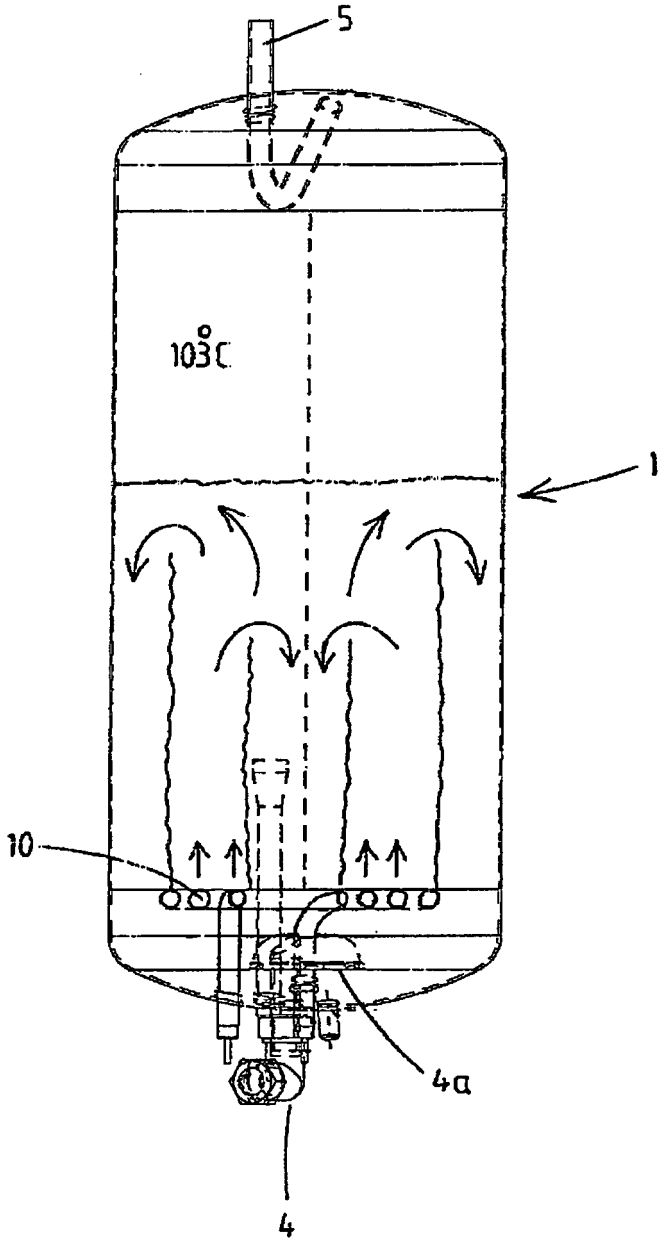

Fig.11

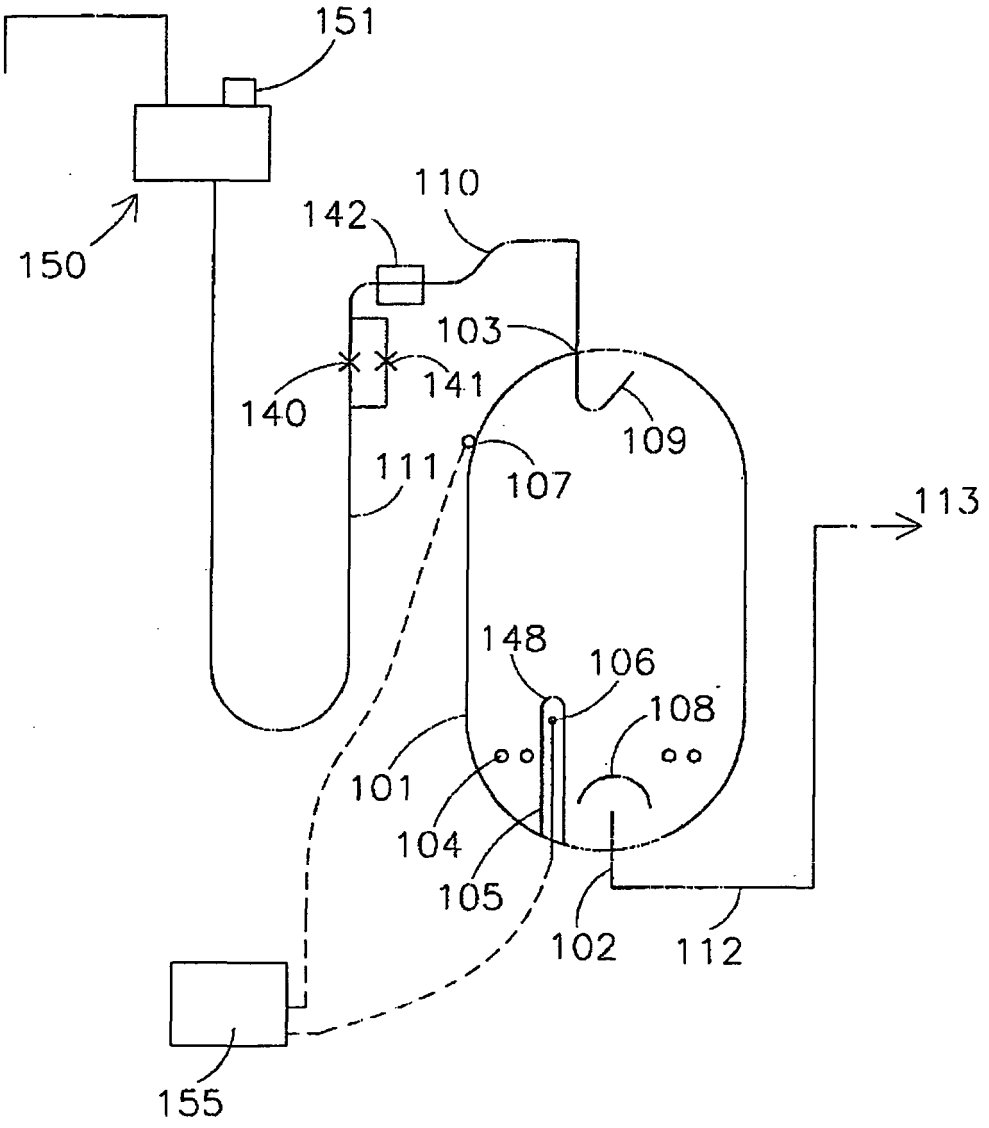
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Fig 12

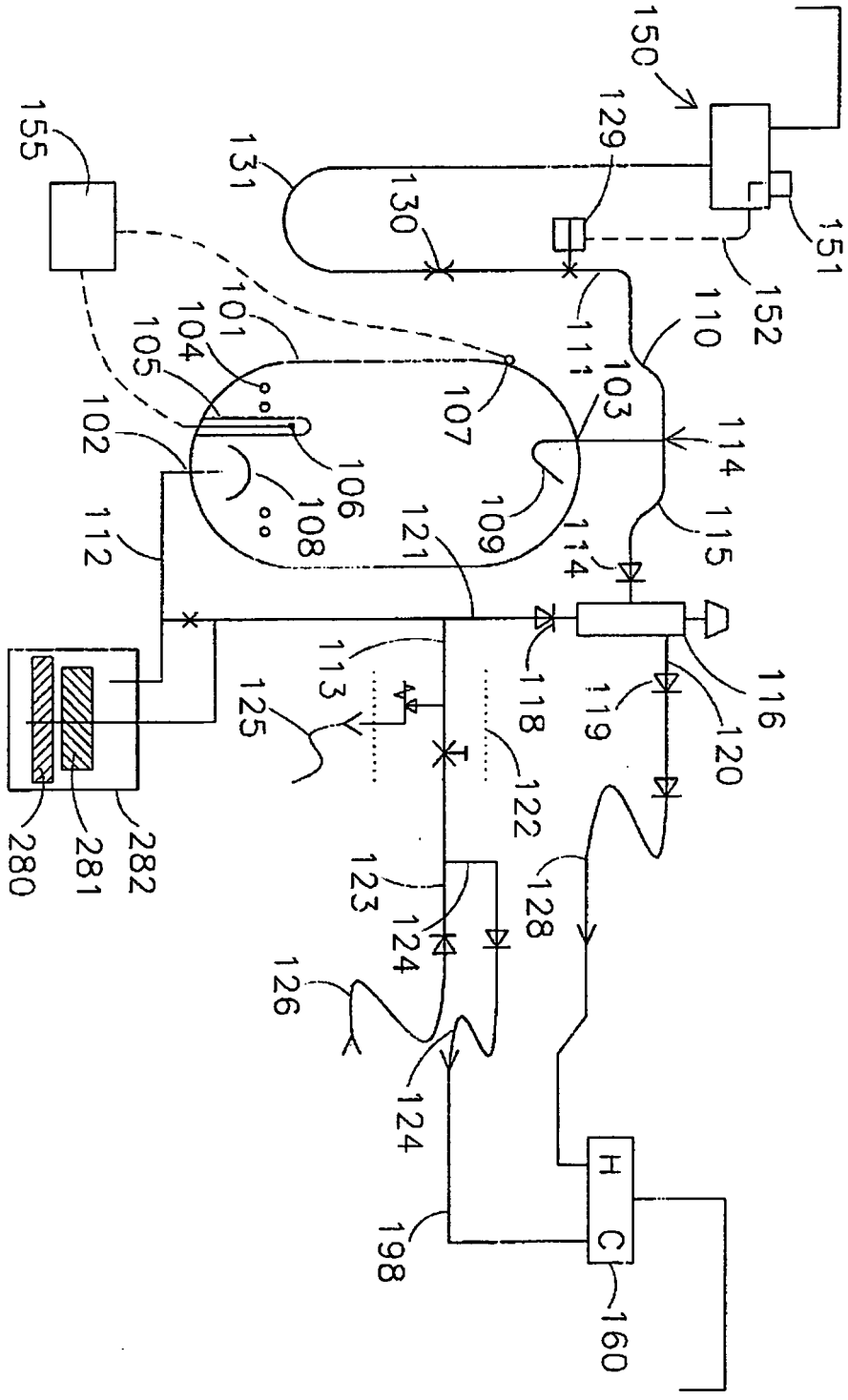
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Fig 13

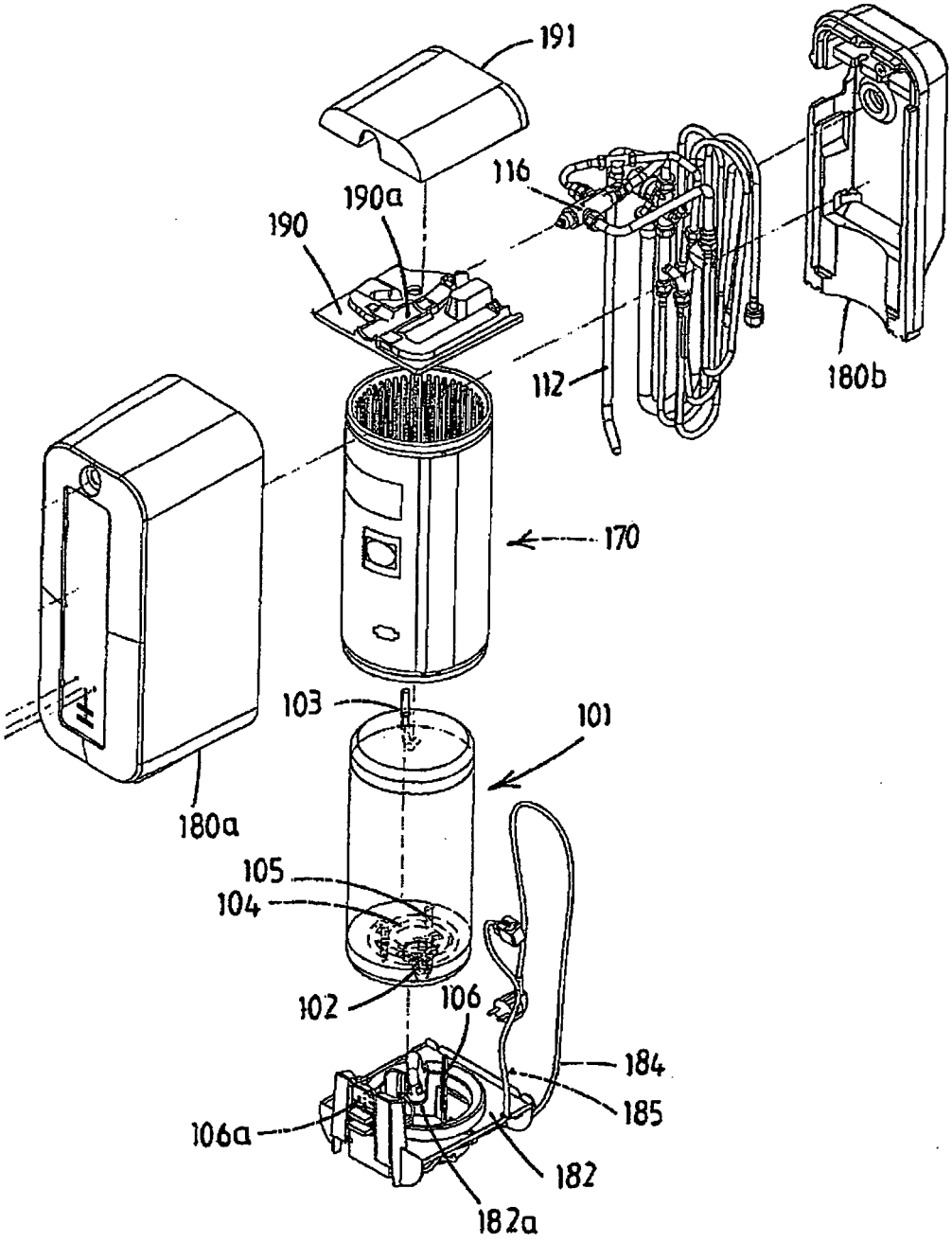
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Fig.14

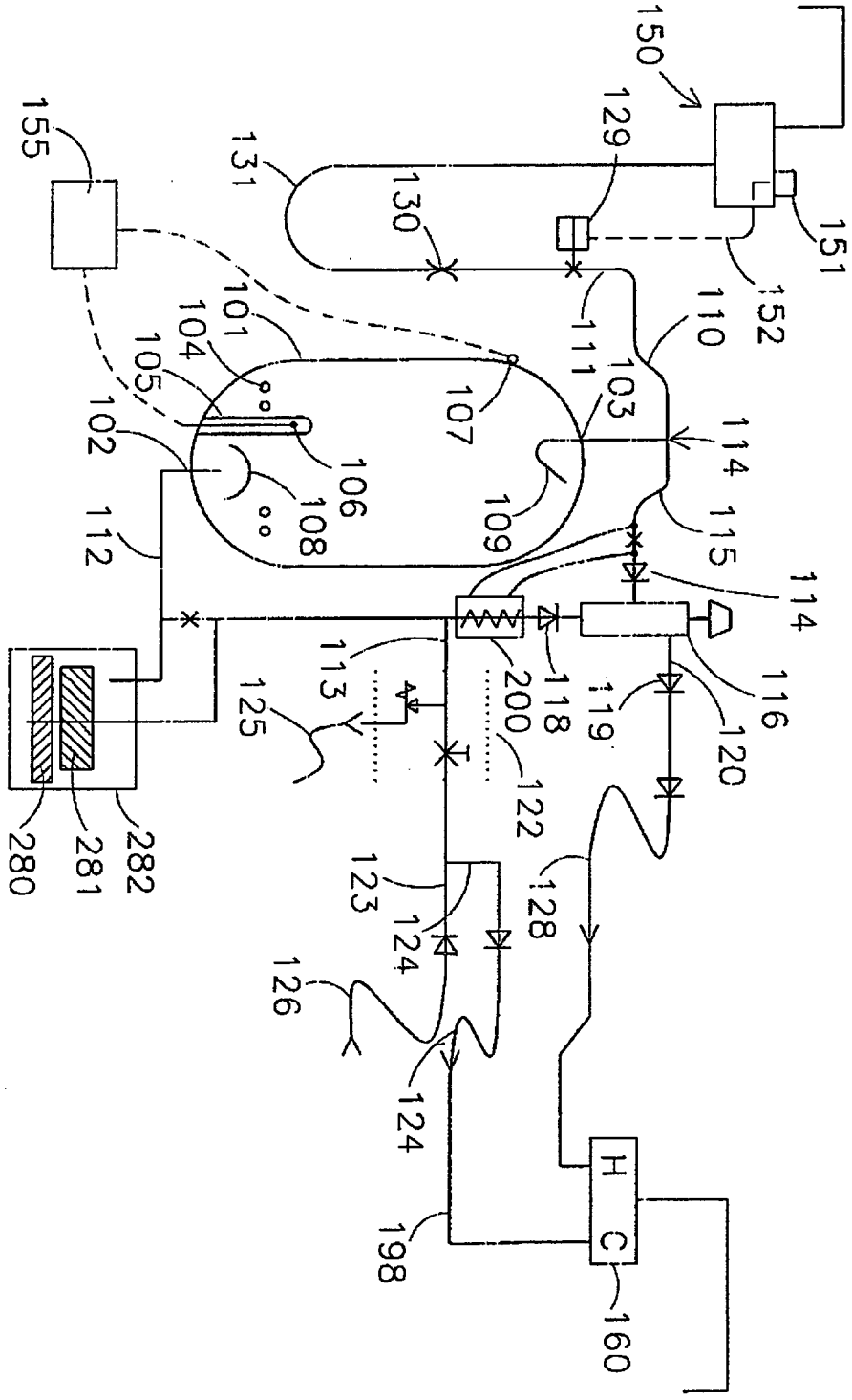
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Fig 15

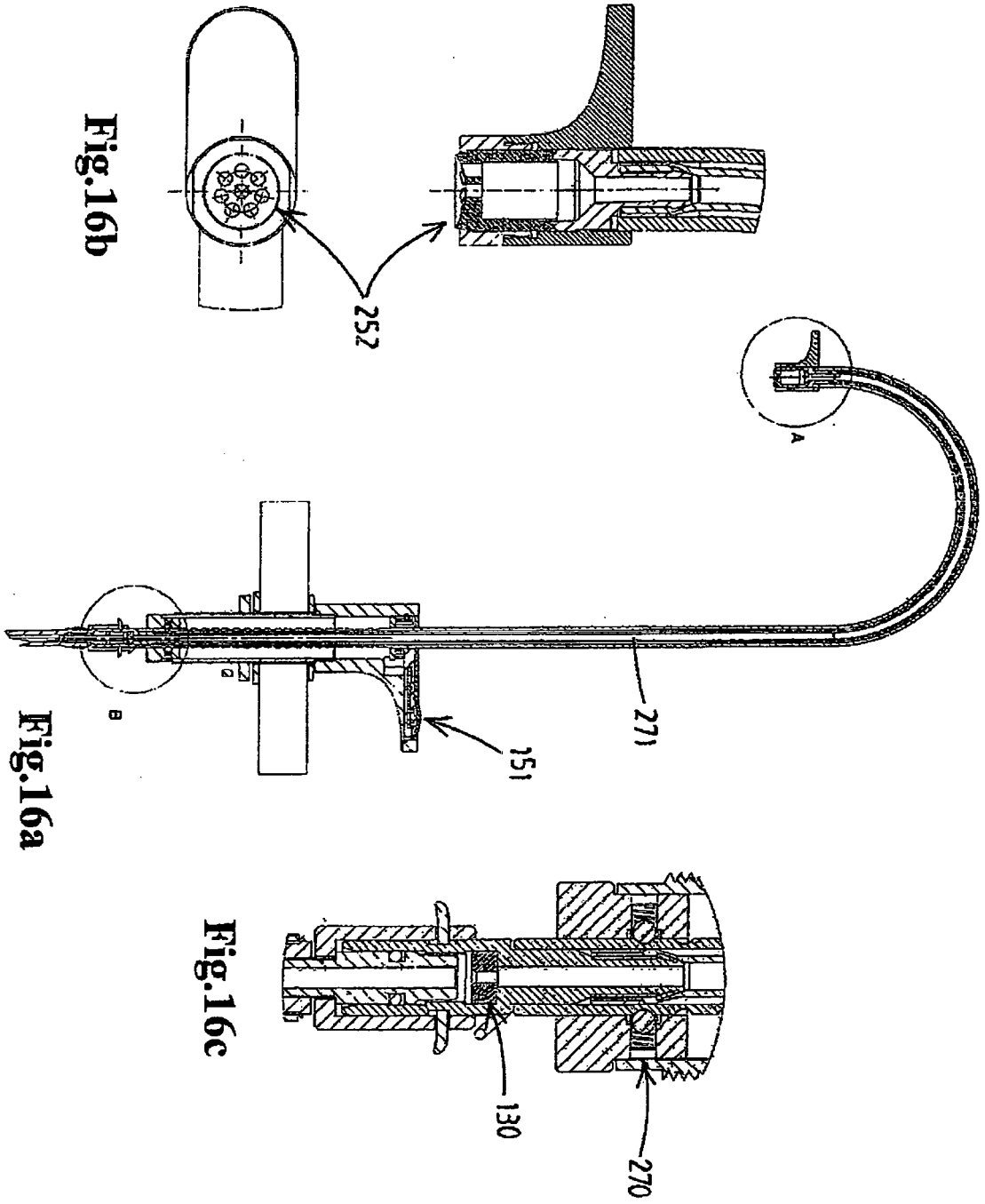

Fig.16b

Fig.16a

Fig.16c

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 6073539 A **[0003]**
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