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(54) **CLIMATE CONTROL APPARATUS**

KLIMAREGELVORRICHTUNG

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Description

[0001] The present invention relates to a climate control apparatus and in particular to a so-called hybrid climate control apparatus.

[0002] So-called hybrid condensing boilers are known which are substantially constituted by a condensing boiler, which uses typically LPG or methane for its own operation, and by an external heat pump which is powered electrically and is often of reduced size and power.

[0003] Generally, the hybrid boiler has a so-called "smart" control mechanism, conceived to optimize electric power and gas consumptions.

[0004] In particular, when the external temperature is relatively high (for example higher than 7°C) only the heat pump, which in this condition is very efficient, operates, whereas when the external temperature is close to 0°C so-called hybrid operation occurs.

[0005] In this case, the performance of the heat pump is significantly lower, and therefore the system uses the fluid preheated by the heat pump to supply it in input to the condensing boiler, which raises the water to the desired temperature.

[0006] When the external temperature is cold (indicatively below 0°C), only the condensing boiler operates. In such conditions, the heat pump is inefficient and the condensing boiler operates at full power in order to ensure the ideal temperature of the water.

[0007] Known solutions provide that the apparatus itself adjusts the threshold temperatures at which to activate one device or the other, based on the external ambient temperature, on the delivery temperature of the home systems, and in some cases on the prices of fuel and electric power that are configured in the system.

[0008] Hybrid condensing boilers are easy to install and require minimal interventions for adaptation with respect to a traditional boiler. Furthermore, no changes need to be made to the radiating system, which besides can also be used during the summer season to cool rooms again by using the heat pump.

[0009] However, in many cases a problem in space occupation is observed, for example if one wishes to position the new condensing boiler as a replacement of an old wall-mounted boiler, due to the need to install both the boiler body and the receptacle of the accumulation compartment and of the hydraulic separator.

[0010] The aim of the present invention is to provide a climate control apparatus that is capable of improving the background art in one or more of the aspects indicated above.

[0011] Within this aim, an object of the invention is to provide a climate control apparatus that is extremely compact so that it can be installed in an extremely practical manner.

[0012] Not least object of the invention is to provide a climate control apparatus that is highly reliable, relatively easy to provide and at competitive costs.

[0013] This aim, as well as these and other objects which will become better apparent hereinafter, are achieved by a climate control apparatus according to claim 1, optionally provided with one or more of the characteristics of the dependent claims.

[0014] Further characteristics and advantages of the present invention will become better apparent from the description of a preferred but not exclusive embodiment of the climate control apparatus according to the invention, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a schematic side view of the boiler assembly of the climate control apparatus according to the present invention;
Figure 2 is a front view of the boiler assembly;
Figure 3 is an exploded view of the boiler assembly;
Figure 4 is a bottom view of the boiler assembly;
Figure 5 is a side view of the climate control apparatus according to the invention;
Figure 6 is a partially exploded schematic view of the climate control apparatus.

[0015] With reference to the above figures, the climate control apparatus according to the invention, designated generally by the reference numeral 1, comprises a boiler assembly 2 and a heat pump 3.

[0016] Furthermore, the boiler assembly 2 is or can be associated functionally with user devices 40, constituted for example by radiators.

[0017] The boiler assembly 2 comprises a boiler structure 11 and an accommodation compartment 12 with an accumulation tank 13 and with a hydraulic separator 14.

[0018] The climate control apparatus 1 further comprises means 30, 31 for the hydraulic connection of the accumulation tank 13 to the boiler structure 11 and to the heat pump 3.

[0019] According to the present invention, the accommodation compartment 12 is provided with means for coupling to a wall 100 and is configured to support in turn the boiler structure 11.

[0020] With reference to the practical embodiment shown in the figures, the accommodation compartment 12 has a substantially parallelepiped structure which forms two mutually opposite main surfaces 12a, 12b.

[0021] In particular, a rear main surface 12a is or can be associated with the means for coupling to the wall 100, while a front main wall 12b is provided with means for connection and support of the boiler structure 11.

[0022] The connection and support means are constituted for example by brackets, pins or dowels for coupling, openings which can be used by screws, etc.

[0023] Preferably, the boiler structure 11 comprises a condensing boiler.

[0024] With reference to the embodiment shown in the figures, the accommodation compartment 12 is made of metal sheets, optionally bent and/or coupled at the edges.

[0025] Conveniently, means for thermal insulation of

the accumulation tank 13 are provided.

[0026] The use of the climate control apparatus 1 according to the invention is fully similar to a traditional hybrid apparatus.

[0027] However, the configuration of the boiler assembly, which provides that the accommodation compartment 12 of the accumulation tank 13 and of the hydraulic separator 14 also provided the wall support for the boiler structure 11 allows a reduction of the time and activities of the installation technician.

[0028] In this manner it is possible, in view of the compactness and simplicity of installation, to replace an old wall-mounted boiler with a hybrid apparatus without further structural interventions.

[0029] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims; all the details may furthermore be replaced with other technically equivalent elements.

[0030] The climate control apparatus according to the invention allows to utilize the system of generators in series without renouncing all the positive aspects of the hydraulic disconnector which allows to make each individual generator work in the correct operating conditions (water flow rates and temperatures).

[0031] Furthermore, differently from other applications provided in series, with the solution according to the present invention the load losses (and therefore the head available to the system) are not worsened and most of all the water of the apparatus (generated heat), which does not pass through the heat pump when the external temperatures inhibit the operation thereof.

[0032] In practice, the materials used, so long as they are compatible with the specific use, as well as the contingent shapes and dimensions, may be any according to the requirements and the state of the art.

[0033] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A climate control apparatus (1), comprising a boiler assembly (2) and a heat pump (3), said boiler assembly (2) comprising a boiler structure (11), an accumulation tank (13), a hydraulic separator (14) and an accommodation compartment (12) for said accumulation tank (13) and for said hydraulic separator (14), said climate control apparatus (1) comprising means for the hydraulic connection of said accumulation tank (13) to said boiler structure (11) and to said heat pump (3), **characterized in that** said accommodation compartment (12) is separate from the boiler structure and is provided with means for coupling to a wall (100) and is configured to support said boiler structure (11).

2. The apparatus (1) according to claim 1, **characterized in that** said accommodation compartment (12) has a substantially parallelepiped structure which forms two mutually opposite main surfaces (12a, 12b), a rear main surface (12a) which can be associated with said coupling means and a front main wall (12b) which is provided with means for the connection and support of said boiler structure (11).

3. The apparatus (1) according to one or more of the preceding claims, **characterized in that** said boiler structure (11) comprises a condensing boiler.

4. The apparatus (1) according to one or more of the preceding claims, **characterized in that** said accommodation compartment (12) is made of metal sheets.

5. The apparatus (1) according to one or more of the preceding claims, **characterized in that** it comprises means for the thermal insulation of said accumulation tank (13).

Patentansprüche

1. Eine Klimaregelvorrichtung (1), die einen Kesselaufbau (2) und eine Wärmepumpe (3) umfasst, wobei der Kesselaufbau (2) eine Kesselstruktur (11), einen Sammeltank (13), eine hydraulische Weiche (14) und einen Aufnahmeraum (12) für den Sammeltank (13) und für die hydraulische Weiche (14) umfasst; wobei die Klimaregelvorrichtung (1) Mittel für die hydraulische Verbindung des Sammeltanks (13) mit der Kesselstruktur (11) und mit der Wärmepumpe (3) umfasst; **dadurch gekennzeichnet, dass** der Aufnahmeraum (12) separat von der Kesselstruktur und mit Mitteln zur Kopplung mit einer Wand (100) ausgestattet und konfiguriert ist, um die Kesselstruktur (11) zu tragen.

2. Die Vorrichtung (1) gemäß Anspruch 1, **dadurch gekennzeichnet, dass** der Aufnahmeraum (12) eine im Wesentlichen quaderförmige Struktur hat, die zwei einander gegenüberliegende Hauptflächen (12a, 12b) bildet, eine hintere Hauptfläche (12a), die mit den Kopplungsmitteln verbunden werden kann, und eine vordere Hauptwand (12b), die mit Mitteln zum Anschluss und zum Tragen der Kesselstruktur (11) ausgestattet ist.

3. Die Vorrichtung (1) gemäß einem oder mehreren der obigen Ansprüche, **dadurch gekennzeichnet, dass** die Kesselstruktur (11) einen Brennwertkessel

umfasst.

4. Die Vorrichtung (1) gemäß einem oder mehreren der obigen Ansprüche, **dadurch gekennzeichnet, dass** der Aufnahmeraum (12) aus Metallblechen besteht.

5. Die Vorrichtung (1) gemäß einem oder mehreren der obigen Ansprüche, **dadurch gekennzeichnet, dass** sie Mittel für die thermische Isolierung des Sammeltanks (13) umfasst.

Revendications

1. Dispositif de climatisation (1), comprenant un ensemble de chaudière (2) et une pompe à chaleur (3), ledit ensemble de chaudière (2) comprenant une structure de chaudière (11), un réservoir d'accumulation (13), un séparateur hydraulique (14) et un compartiment de logement (12) pour ledit réservoir d'accumulation (13) et pour ledit séparateur hydraulique (14), ledit dispositif de climatisation (1) comprenant des moyens pour la connexion hydraulique dudit réservoir d'accumulation (13) à ladite structure de chaudière (11) et à ladite pompe à chaleur (3), **caractérisé en ce que** ledit ensemble de chaudière (2) est séparé de ladite structure de chaudière et est pourvu de moyens pour couplage à une paroi (100) et est configuré pour supporter ladite structure de chaudière (11).

2. Dispositif (1) selon la revendication 1, **caractérisé en ce que** ledit compartiment de logement (12) a une structure sensiblement parallélépipédique qui forme deux surfaces principales (12a, 12b) mutuellement opposées, une surface principale arrière (12a) qui peut être associée auxdits moyens de couplage et une paroi principale avant (12b) qui est pourvue de moyens pour la connexion et le support de ladite structure de chaudière (11).

3. Dispositif (1) selon une ou plusieurs des revendications précédentes, **caractérisé en ce que** ladite structure de chaudière (11) comprend une chaudière à condensation.

4. Dispositif (1) selon une ou plusieurs des revendications précédentes, **caractérisé en ce que** ledit compartiment de logement (12) est fait de tôles métalliques.

5. Dispositif (1) selon une ou plusieurs des revendications précédentes, **caractérisé en ce qu'**il comprend des moyens pour l'isolation thermique dudit réservoir d'accumulation (13).

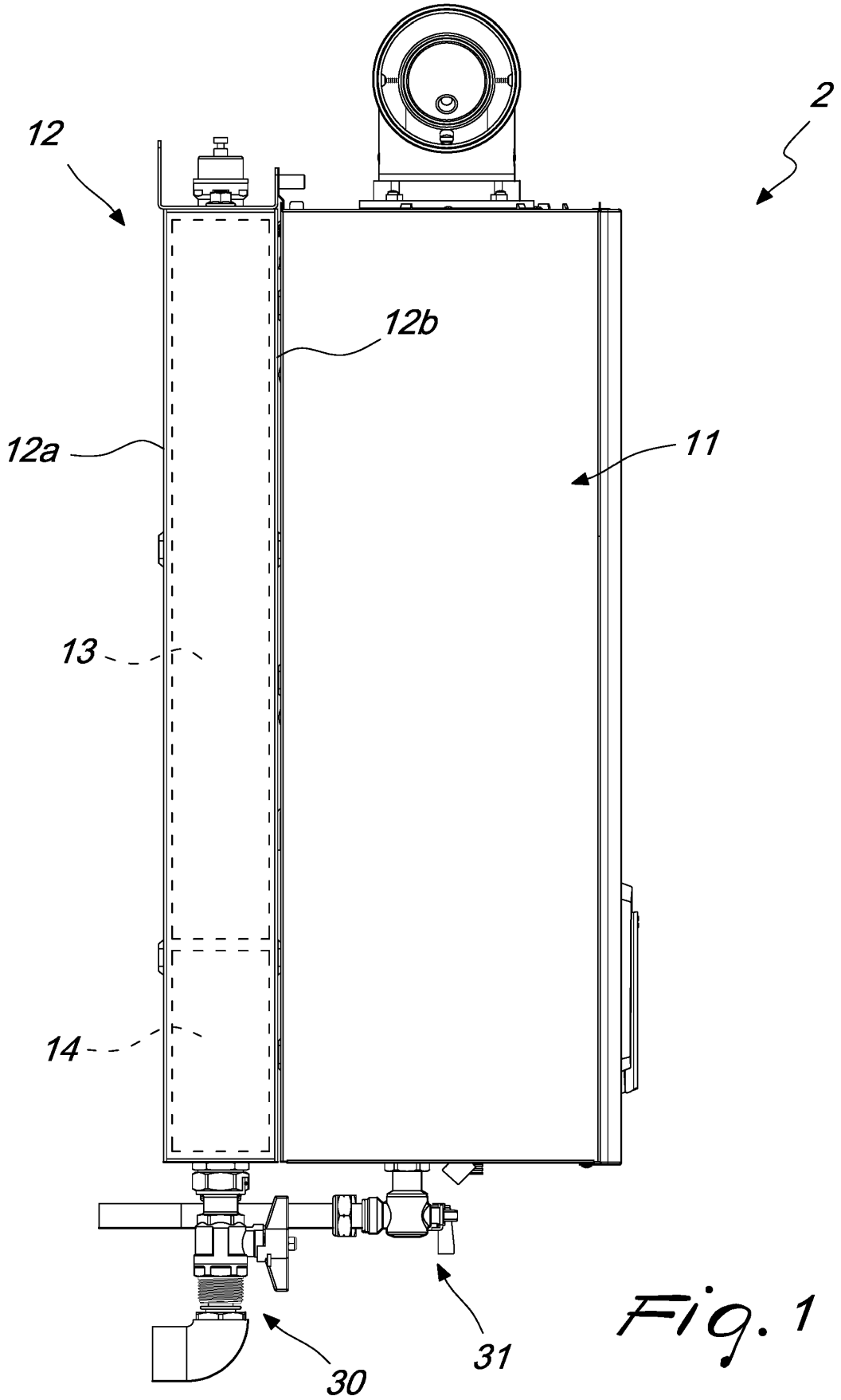


Fig. 1

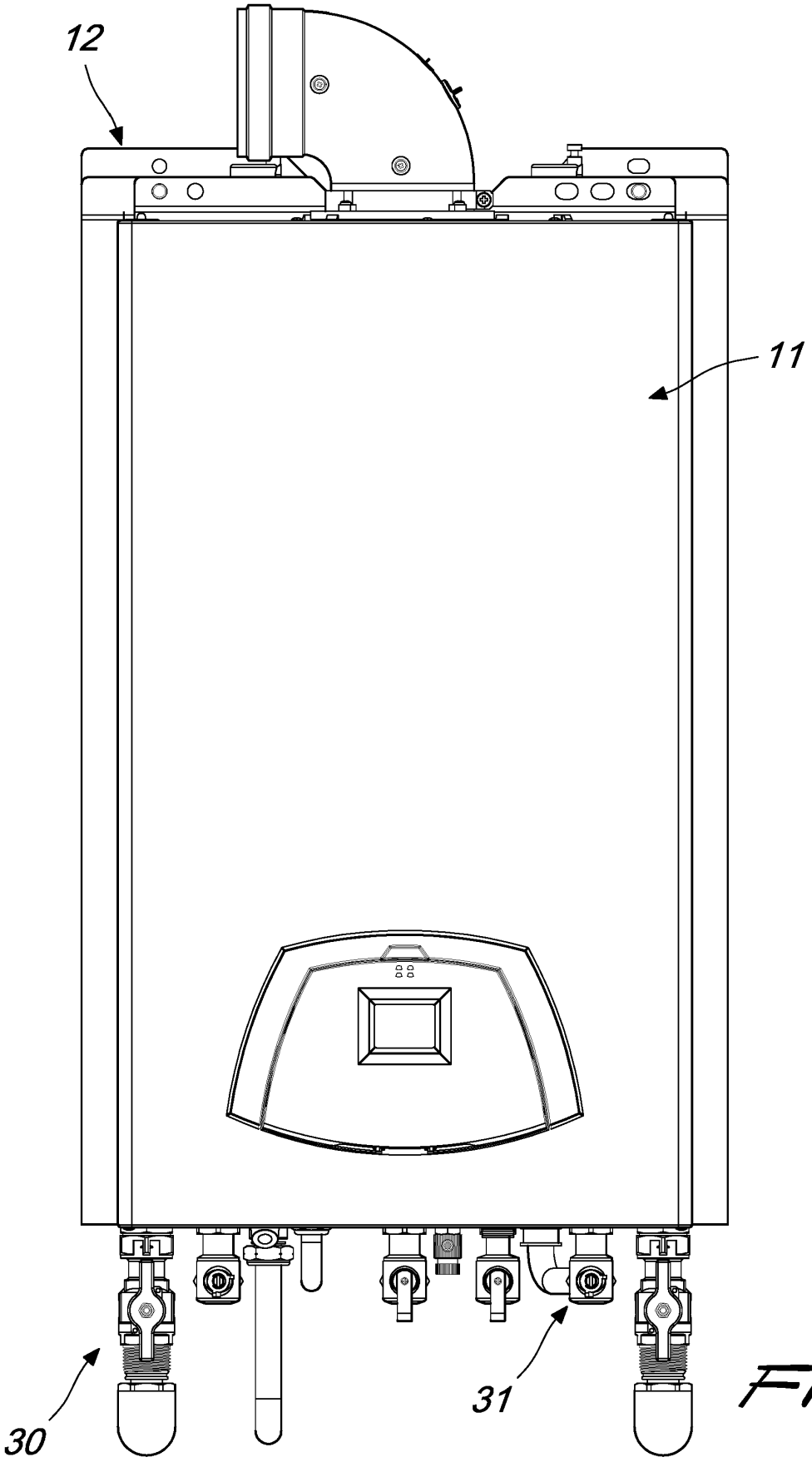


Fig. 2

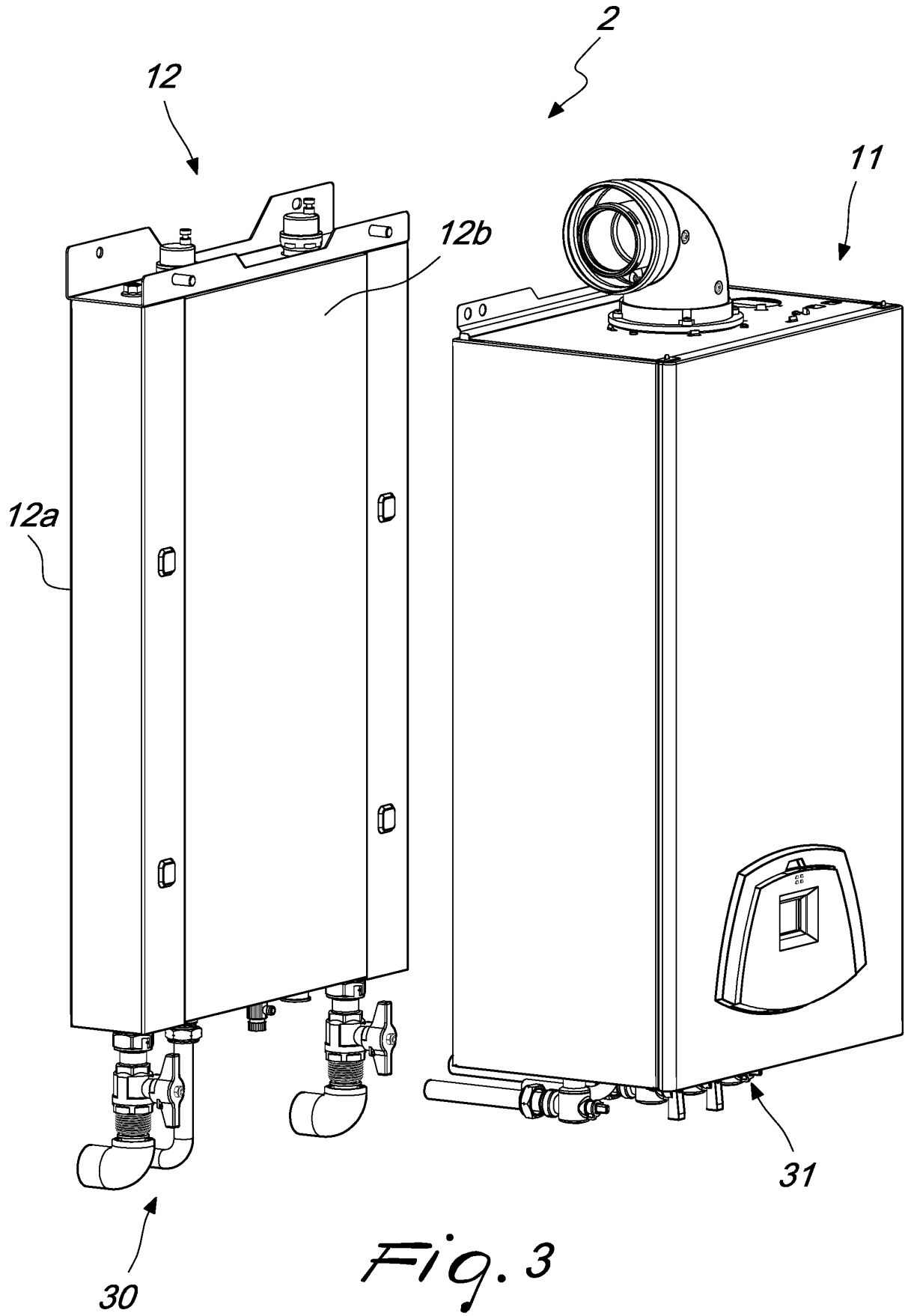


Fig. 3

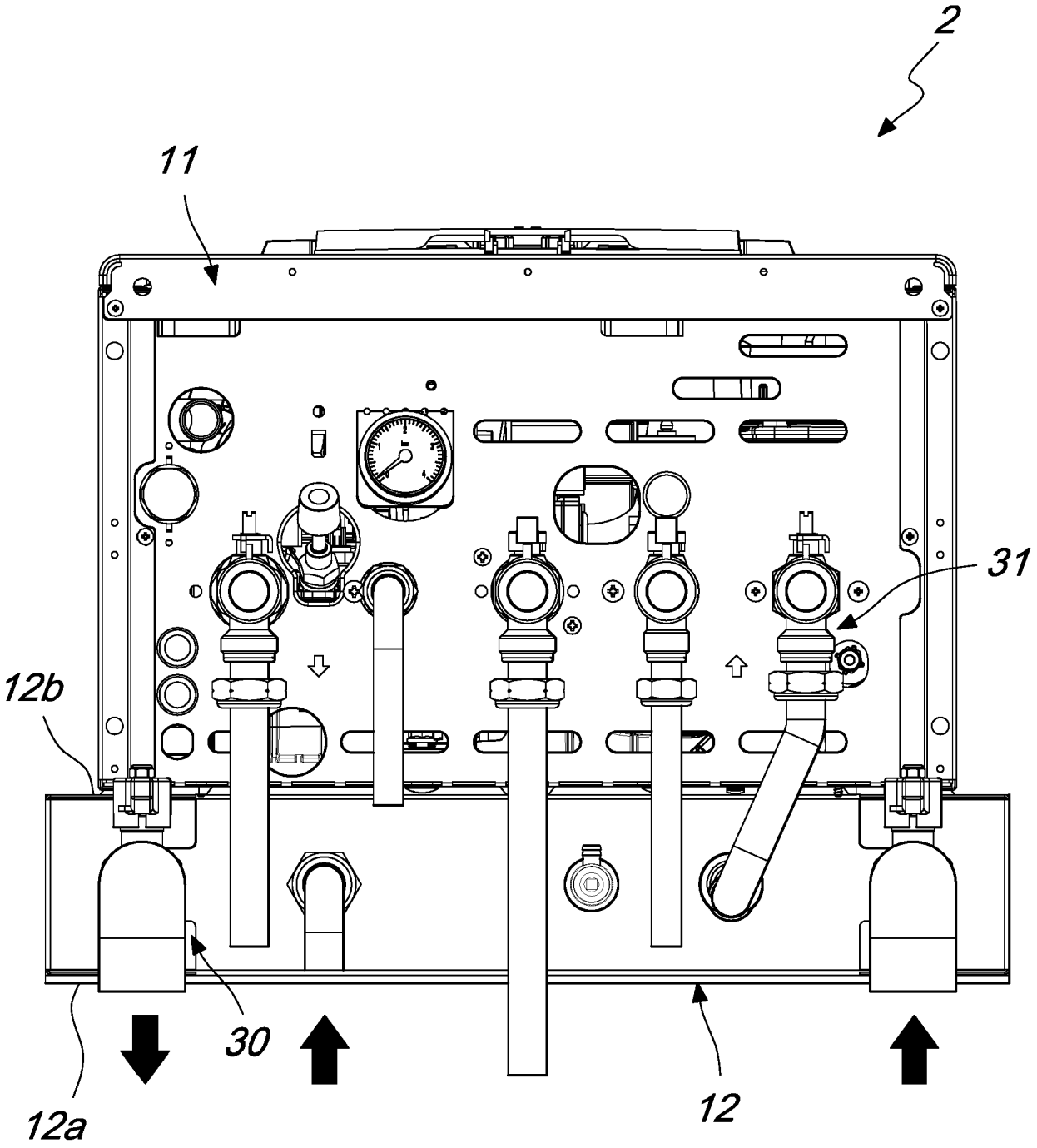


Fig. 4

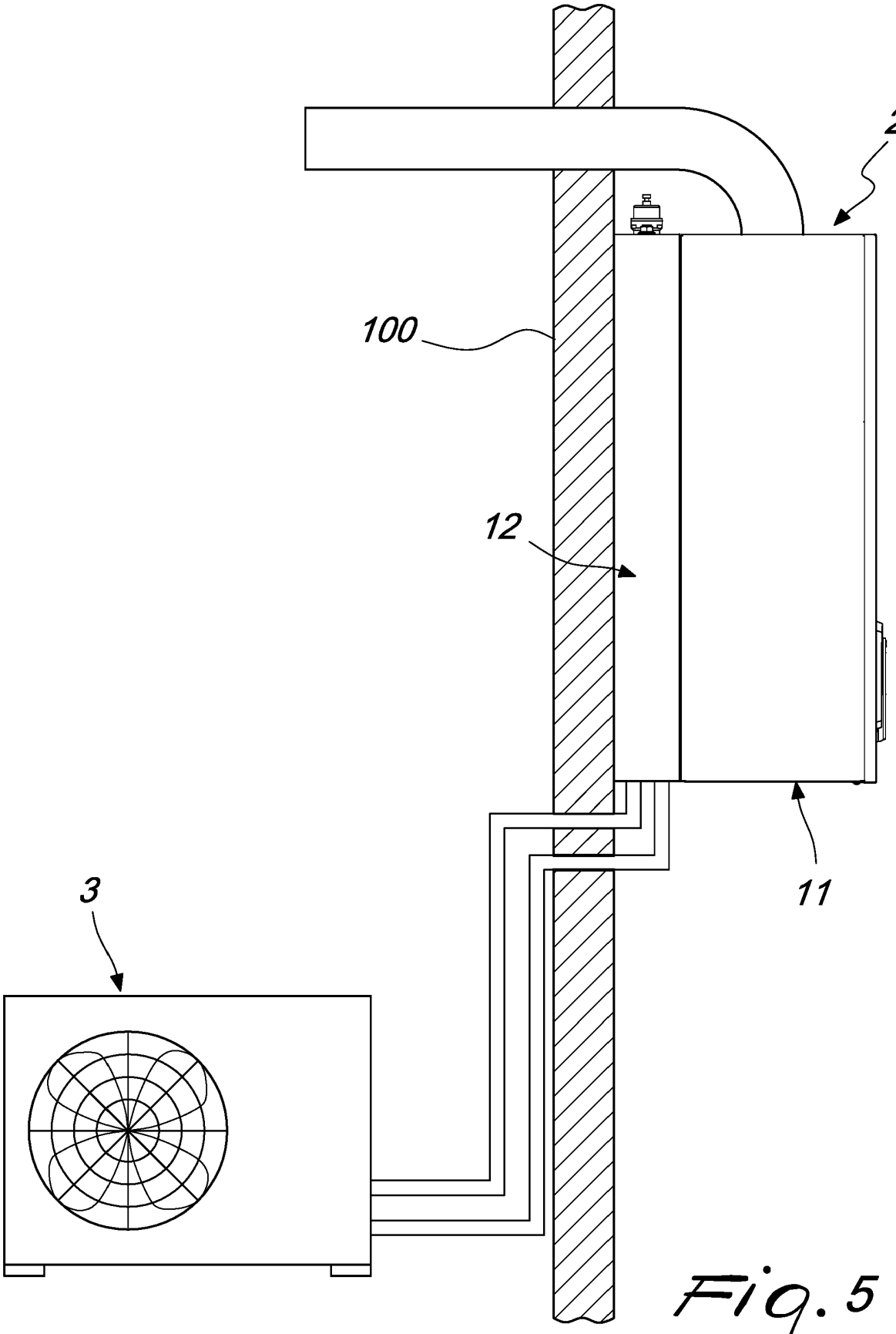


Fig. 5

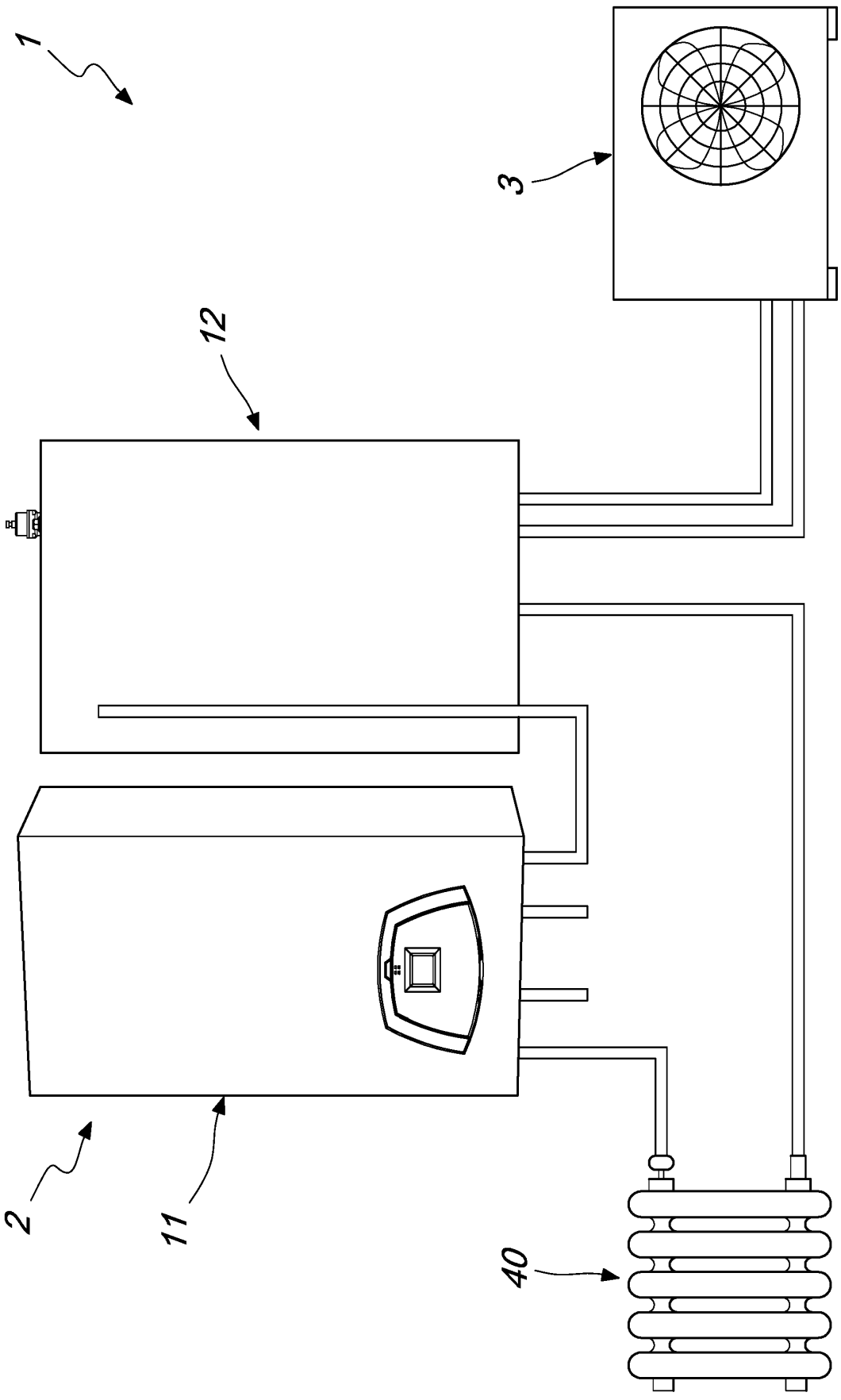


Fig. 6