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(54) **Heating device with removable front cover, method for maintaining a heating device**

Heizvorrichtung mit abnehmbarer Frontabdeckung, Verfahren zum Warten einer Heizvorrichtung

Dispositif de chauffage à couvercle frontal amovible, procédé pour entretenir un dispositif de chauffage

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Description

[0001] The invention relates to a heating device according to the preamble of claim 1. Such a heating device is used to heat a medium, such as water. The heated water is then used to heat rooms by passing the heated medium through one or more radiators. Alternatively or additionally, the heated water can be used as hot tap water by users.

[0002] DE-A1-101.30.925 discloses a heating device for heating water. The heating device comprises a housing, a burner and a heat exchanger. In normal use, the burner is provided on top of the heat exchanger. The flames from the respective burner are directed downwards and transfer heat to water in the heat exchanger. The heating device furthermore comprises a bottom. A condensation tray is fixedly provided in the bottom. In the position of use, the heat exchanger rests in the condensation tray, as a result of which the latter forms the bottom of the heat exchanger. The condensation tray is furthermore connected to a flue-gas discharge for discharging the flue gases which flow out of the burner into the condensation tray via the heat exchanger. The heating device furthermore comprises rotation means. In order to carry out maintenance on the heat exchanger, the latter can be lifted out of the condensation tray and rotated into a maintenance position outside the housing of the heating device by the rotation means. As a result of this combined translational and rotary movement, it is possible to inspect and/or clean the heat exchanger from below.

[0003] A problem associated with the known heating device is the fact that it is relatively complicated from a mechanical point of view.

[0004] It is an object of the present invention to provide a heating device which at least partly eliminates the abovementioned drawback or at least to provide an alternative. In particular, it is an object of the present invention to provide a heating device which is simpler than those of the prior art.

[0005] The invention achieves this object by means of a heating device according to claim 1. Advantageous embodiments are defined in the dependent claims.

[0006] Due to the invention, a maintenance engineer can easily reach the components inside the housing and in particular clean the interior of the heat exchanger from above without the latter having to be removed from the housing in any way.

[0007] Where this patent document mentions rear, front, left-hand, right-hand, bottom and top, these relate to a standard position of use of the heating device, in which the latter may be fitted against a wall by its rear side, or hangs on a wall and operating means are provided on the front side, such as a control panel which is optionally concealed behind a cover or flap. As a rule, the top side of the heating device is the side where a connection for an external flue-gas discharge is provided.

[0008] It should be noted that WO-2004/101982 discloses a heating device with a housing, cover, heat exchanger, air supply line and a flue-gas discharge line. The housing comprises a top housing wall, lateral housing walls, a rear housing wall and a housing bottom. The heating device furthermore comprises a burner for supplying hot gases to a Stirling engine and an additional burner. After driving the Stirling engine, the hot gases are passed through the heat exchanger. The heat exchanger with burners is placed on a support. The Stirling engine is situated underneath the support and rests with its top side against the bottom of the heat exchanger. The heat exchanger and Stirling engine are partly in front of an imaginary front face which is defined by the respective front sides of the housing bottom and the top housing wall. The burner is situated at the bottom of the heat exchanger and not at the top, as is the case in the present invention. Furthermore, WO-2004/101982 does not disclose that the burner and heat exchanger are removably attached. Finally, it does not disclose that the top housing wall extends less far from the rear housing wall towards the cover at the location of one of the lateral housing walls than the housing bottom extends from the rear housing wall towards the cover at the location of the same one of the lateral housing walls. Neither does the heating device from WO-2004/101982 suffer from the problem which the present invention solves. Due to the fact that the burner is not situated at the top and is moreover not removably attached, the interior of the heat exchanger cannot and does not have to be cleaned from above.

[0009] In particular, in a side view of the housing, the respective front sides of the left-hand lateral housing wall and the right-hand lateral housing wall extend obliquely with respect to the rear housing wall in such a manner that the left-hand lateral housing wall and the right-hand lateral housing wall are narrower at their top side than at their bottom side, and the respective front sides in particular are situated in the imaginary front face. Due to this configuration, additional space is created on the side of the top side of the housing to maintain the heating means.

[0010] In an advantageous embodiment, the front of the top housing wall has a convexly curved shape in a top view of the housing. As a result thereof, the required space is created for a flue-gas connection, on the one hand, and on the other hand additional space is created towards the sides for maintaining the heating means.

[0011] In an embodiment, the cover comprises a front cover wall, a top cover wall, and a bottom cover wall, in which the top cover wall and the bottom cover wall are each fixedly connected to the front cover wall in a gas-tight manner, each extend from the front cover wall towards the housing and each join onto the front of the top housing wall and the housing bottom, respectively, in a gas-tight manner with their rear side facing away from the front cover wall. This is an advantageous way of creating space in the cover for accommodating the protruding part of the heating components.

[0012] In particular, the top cover wall extends further from the front cover wall towards the housing than the bottom cover wall, and preferably the top cover wall ex-

tends so much further towards the housing than the bottom cover wall, that the front cover wall extends substantially vertically in the position of use. This creates additional space at the top side of the cover for accommodating protruding heating components, in accordance with the relatively small depth of the housing at the top side.

[0013] More particularly, the cover furthermore comprises a left-hand lateral cover wall and a right-hand lateral cover wall, each of which is fixedly connected to the front cover wall in a gas-tight manner, each of which extends from the front cover wall towards the housing and each of which joins onto the front of the left-hand lateral housing wall and the right-hand lateral housing wall, respectively, in a gas-tight manner with a rear side facing away from the front cover wall. By providing the cover with lateral walls, the lateral walls of the housing can be made accordingly smaller which further improves the accessibility of the heating components.

[0014] In an advantageous embodiment, the housing bottom is connected to the left-hand lateral housing wall and the right-hand lateral housing wall at a position between the top and bottom edge of the respective lateral housing wall, as a result of which the respective lateral housing walls extend underneath the housing bottom. Thus, a space is created in the housing underneath the gas-tight space for components which do not have to be accommodated in the gas-tight space.

[0015] The invention also relates to a method for maintaining a heating device, as defined in the respective claims.

[0016] It should be noted that DE-42.32.340 discloses a method for maintaining a heating device. A cover of the heating device is removed in order to carry out said maintenance. However, in this case, maintenance is carried out on a control circuit rather than a heat exchanger.

[0017] The invention will be explained in more detail with reference to an embodiment which is illustrated in the attached drawing, in which:

Fig. 1 shows a perspective view of a heating device according to the invention;
Fig. 2 shows the heating device from Fig. 1 with the cover removed;
Fig. 3 shows the view from Fig. 2, in which a number of heating components have been removed;
Fig. 4 shows a housing of the heating device from Figs. 1-3;
Fig. 5 shows a housing of a second embodiment;
Fig. 6 shows a housing of a third embodiment; and
Fig. 7 shows a housing of a fourth embodiment.

[0018] Figs. 1 and 2 show a heating device according to the invention which is denoted overall by reference numeral 1. In this case, the heating device 1 is a wall-mounted central heating boiler which is mounted on a wall by its rear side. The heating device 1 comprises a housing 2 which, in this case, is made from a folded piece of sheet metal material.

[0019] The heating device 1 furthermore comprises a cover 4 and heating components 6 which, inter alia, comprise an air supply 8 for combustion air, a gas supply line (not shown) and a flue-gas discharge line 10. The heating components furthermore comprise a ventilating fan 14, a burner 16, and a heat exchanger 18. Both the air supply 4 and the gas hose 12 run towards the ventilating fan 14, where gas and air are mixed. An outlet of the ventilating fan 14 is connected to the burner 16 which, together with the heat exchanger 18, forms a heat block 20. The burner 16 is attached to a top side of the heat exchanger 18 and can be removed therefrom by removing connecting means (not shown), such as bolts.

[0020] On a bottom side, the heat exchanger 18 is in open communication, via a condensate collector 22, with the flue-gas discharge line 10 which in this case comprises a flat flue-gas discharge pipe 24 and an S-shaped flue-gas bend 26. The flue-gas discharge pipe 24 is in open communication with the S-shaped flue-gas bend 26 which runs to a connecting opening 28 which is provided in a top side of the housing 2.

[0021] The connection 28 is a concentric double-walled connection, an inner circular opening part acts as connecting opening for flue gases and an outer annular opening part is intended as a combustion-air supply opening. Depending on the local requirements, the connection 28 may be provided with a manifold 30 which divides the concentric connection 28 into a first connecting part 32 which is in open communication with the connecting opening for flue gases and a second connecting part 33 which is in open communication with the outer annular opening part which serves as the combustion-air supply opening.

[0022] The housing 2 of the heating device 1 comprises a housing bottom 34, a rear housing wall 36, a left-hand lateral housing wall 38, a right-hand lateral housing wall 40, and a top housing wall 42. The left-hand lateral housing wall 38, the right-hand lateral housing wall 40, the housing bottom and the top housing wall 42 are fixedly connected to the rear housing wall 36 in a gas-tight manner. The left-hand lateral housing wall 38, the right-hand lateral housing wall 40, the housing bottom 34 and the top housing wall 42 each extend from the rear housing wall 36 towards the cover. The left-hand lateral housing wall 38 has a front side 44, the right-hand lateral housing wall 40 has a front side 46, the housing bottom 34 has a front side 48 and the top housing wall 42 has a front side 50 (see Fig. 3). The front side is in each case the side of the respective wall which is turned away from the rear housing wall 36.

[0023] In this exemplary embodiment, the heat exchanger 18 is provided on the housing bottom 34 via the condensate collector 22. The housing bottom 34 is connected to the left-hand lateral housing wall 38 and the right-hand lateral housing wall 40 at a position between the top and bottom edge of the respective lateral housing wall 38, 40, as a result of which the respective lateral

housing walls 38, 40 extend underneath the housing bottom. Thus, the bottom side of the housing bottom 34, together with the downwardly protruding parts of the lateral housing wall 38, 40 and a corresponding part of the rear housing wall 36 delimits a space inside the housing 2 which is not gas-tight and which is intended to accommodate some of the heating components 6 and the electronic control unit of the heating device 1. In Figs. 1-3, a control panel 51 of the electronic control unit can be seen.

[0024] In a position of use, the cover 4 is removably connected to a front side of the housing 2. To this end, the heating device is provided with fastening means, including loop-shaped openings 52 on the rear and top side of the cover 4 which are attached to projections 54, which projections 54 are situated on the top and front side of the housing 2. The fastening means furthermore comprise bolts 56 which are inserted into corresponding holes on the bottom side of the cover 4 and screwed into threaded holes 58.

[0025] In the position of use, the cover 4 joins onto the respective front sides 44-50 of the left-hand lateral housing wall 38, the right-hand lateral housing wall 40, the housing bottom 34 and the top housing wall 42 in a gas-tight manner to form a space 60 inside the housing 2 which is gas-tight with respect to an environment in which the heating device is installed. The gas-tight space 60 contains the heating components 6, such as the air supply 8, a part of the gas supply line (not shown), the flue-gas discharge line 10, the ventilating fan 14, the burner 16, the heat exchanger 18, and the condensate collector 22.

[0026] At both the left-hand and the right-hand lateral housing walls 38, 40, the top housing wall 42 extends less far from the rear housing wall 36 towards the cover 4 than the housing bottom 34 extends from the rear housing wall 36 towards the cover at the location of the same lateral housing wall. A front face 62 is defined by the respective front sides 48, 50 of the housing bottom 34 and the top housing wall 42. The front face 62 is open and is thus an imaginary, non-physical face. At least a part of both the air supply 8 and the flue-gas discharge line 10 is situated between the front face 62 and the cover 4 when this is in the position of use. In other words, the air supply 8 and the flue-gas discharge line 10 run through the front face 62.

[0027] In a side view of the housing 2, the respective front sides 44, 46 of the left-hand lateral housing wall 38 and the right-hand lateral housing wall 40 run obliquely with respect to the rear housing wall in such a manner that the left-hand lateral housing wall 38 and the right-hand lateral housing wall 40 are narrower at their top side than at their bottom side. In this case, the respective front sides 44, 46 are situated in the front face 62. In a top view of the housing, the front side 50 of the top housing wall 42 has a convexly curved shape. As a result thereof, midway along the left-hand and the right-hand lateral housing wall 38, 40, the top housing wall 42 extends further from the rear housing wall 36 towards the cover 4, than at the location of the left-hand and the right-hand lateral housing wall 38, 40. Consequently, there is just sufficient space to fit the concentric connection 28 in the top housing wall 42, while additional space is created on the side to reach the heat exchanger 18 and other components in the space 60. As a result of the shape of the front sides 48 and 50, the shape of the front face 62 has a single curve.

[0028] The cover 4 comprises a front cover wall 64, a top cover wall 66, a bottom cover wall 68 (illustrated by a dashed line in Fig. 1), a left-hand lateral cover wall (not shown), and a right-hand lateral cover wall 70. The top cover wall 66, the bottom cover wall 68, and the left-hand lateral cover wall and right-hand lateral cover wall 70 are each fixedly connected to the front cover wall 64 in a gas-tight manner, each extend from the front cover wall 64 to the housing 2 and each join onto the front sides 44-50 of respectively the left-hand lateral housing wall 38, the right-hand lateral housing wall 40, the housing bottom 34 and the top housing wall 42 with a rear side (not shown) facing away from the front cover wall 64 in gas-tight manner.

[0029] The top cover wall 66 extends further from the front cover wall 64 towards the housing 4 than the bottom cover wall 68. The difference between the two corresponds to that between the housing bottom 34 and the top housing wall 42. In the position of use, the front cover wall 64 thus extends substantially vertically.

[0030] In use, maintenance is carried out on the heating device by firstly removing the cover 4 by loosening bolts 56 and lifting the cover 4 with its loops 52 over the projections 54. Subsequently, if desired, one or more heating components 6 can be removed, or taken care of, such as the air supply 8, the flue-gas discharge line 10, the ventilating fan 14, and the burner 16. This results in the situation as shown in Fig. 3. In this situation, due to the relatively shallow top housing wall 42, a maintenance engineer can inspect and/or clean the inside of the heat exchanger 18 more comfortably than if the top housing wall 42 had been as deep as the housing bottom 34. This accessibility is increased further as a result of the spherical shape of the front edge 50 of the top housing wall 42. Following maintenance, any heating components 6 which have been removed are re-installed and the cover is replaced.

[0031] Figs. 4-6 show four basic variants, all of which fall within the scope of the invention, in which the respective cover is shown in each case by means of dashed lines so that the interior of the heating device is visible. In addition, for the sake of clarity, only the respective housing is shown, as it is clear to the person skilled in the art how the heating components can be installed here. The variant from Fig. 4 corresponds to the embodiment from Figs. 1-3 which has been described in detail above and will not be described again.

[0032] Fig. 5 shows a second embodiment of a heating device 101 according to the invention with a housing 102 and a cover 104. The housing 102 comprises a housing

bottom 134, a rear housing wall 136, a left-hand lateral housing wall 138, a right-hand lateral housing wall 140, and a top housing wall 142. In contrast with the first embodiment, the front edges of the housing bottom 134 and the top housing wall 142 are straight. As a result thereof, the accessibility to the heating means (not shown) is slightly reduced, but a simpler, i.e. straight, front face and a correspondingly simpler connection to the cover 104 are produced.

[0033] Fig. 6 shows a third embodiment of a heating device 201 according to the invention with a housing 202 and a cover 204. The housing 202 comprises a housing bottom 234, a rear housing wall 236, a left-hand lateral housing wall 238, a right-hand lateral housing wall 240, and a top housing wall 242. In contrast with the first embodiment, the housing bottom 234 is fitted near the bottom edges of the left-hand lateral housing wall 238 and the right-hand lateral housing wall 240, as a result of which the entire internal space of the housing 202 is gas-tight with respect to the environment. This means that substantially all heating components are situated inside the gas-tight space of the heating device.

[0034] Fig. 7 shows a fourth embodiment of a heating device 301 according to the invention with a housing 302 and a cover 304. The housing 302 comprises a housing bottom 334, a rear housing wall 336, a left-hand lateral housing wall 338, a right-hand lateral housing wall 340, and a top housing wall 342. This fourth embodiment can be seen as a combination of Figs. 5 and 6, as the housing bottom 334 is placed low and the front edges of the housing bottom 334 and the top housing wall 342 are straight.

[0035] Still more variants are possible within the scope of the invention. Thus, a heating device other than a central heating boiler may achieve the advantages of the invention, such as a water heater. Although currently burners which are gas-fired are commonly used, it is also possible to use other fuels, in particular fluid fuels. It is also possible to heat media other than water in a heat exchanger.

[0036] The edges of the lateral housing walls do not have to be straight, but they may also be concavely or convexly curved. It is also possible for the respective edges to first extend vertically downwards and then perpendicularly or obliquely forwards to the point where the front of the housing bottom meets the lateral housing walls. This further improves accessibility of the combustion components. Alternatively, the respective edges may first extend perpendicularly or obliquely forwards and then vertically downwards to the point where the front of the housing bottom meets the lateral housing walls. As a result thereof, the cover does not have to be provided with lateral walls.

[0037] The cover can also be removably attached in another manner, for example by means of permanent hinges along the top side, a side, or a bottom side of the housing. The bottom wall of the cover may be relatively small, depending on the position of the housing bottom and the degree to which it protrudes. In a minimal situation, the bottom cover wall only consists of means to achieve a gas-tight connection to the front of the housing bottom.

[0038] The walls of the housing can make angles with respect to one another other than right angles. The connection of the cover to the housing may be an abutting connection, as illustrated. There may also be a small overlap between the lateral walls of the cover and housing. A small overlap is understood to mean an overlap of a few millimetres and of at most 10 or 20 millimetres. There may be more or fewer components inside the gas-tight space than illustrated. At least the heating block and a part of the flue-gas discharge line are situated in the gas-tight space. The housing and cover may be made from a plastic or from a metal, or from another suitable material.

Claims

1. Heating device, comprising a housing (2), a cover (4), and heating components (6), in which the heating components (6) comprise a burner (16), a heat exchanger (18), an air supply line (8), and a flue-gas discharge line (10),
the burner (16) is removably connected to a top side of the heat exchanger (18) in order to heat a medium which flows through the heat exchanger (18), in a position of use, the cover (4) is removably connected to a front side of the housing (2),
the housing (2) comprises a rear housing wall (36), a left-hand lateral housing wall (38), a right-hand lateral housing wall (40), a housing bottom (34) and a top housing wall (42), the left-hand lateral housing wall (38), the right-hand lateral housing wall (40), the housing bottom (34) and the top housing wall (42) are each fixedly connected to the rear housing wall (36) in a gas-tight manner, each extend from the rear housing wall (36) to the cover (4) and each comprise a front side (44, 46, 48, 50) on the respective sides facing away from the rear housing wall (36), and in the position of use, the cover (4) joins onto the respective front sides (44, 46, 48, 50) of the left-hand lateral housing wall (38), the right-hand lateral housing wall (40), the housing bottom (34) and the top housing wall (42) in a gas-tight manner in order to create a space (60) inside the housing (2) which is gas-tight with respect to an environment in which the heating device is installed, in which gas-tight space (60) at least the heating components (6) are provided,
an imaginary front face (62) is defined by the respective front sides (44, 46, 48, 50) of the left-hand lateral housing wall (38), the right-hand lateral housing wall (40), the housing bottom (34) and the top housing wall (42), and at least a part of at least one of the heating components (6) is situated between the imaginary front face (62) and the cover (4) in the posi-

tion of use,
characterized in that
at the location of one of the lateral housing walls (38, 40), the top housing wall (42) extends less far from the rear housing wall (36) towards the cover (4) than the housing bottom (34) extends from the rear housing wall (36) towards the cover (4) at the location of the same one of the lateral housing wall (38, 40), such that a maintenance engineer can easily reach the components inside the housing (2).

2. Heating device according to claim 1, in which, in a side view of the housing (2), the respective front sides (44, 46) of the left-hand lateral housing wall (38) and the right-hand lateral housing wall (40) extend obliquely with respect to the rear housing wall (36) in such a
manner that the left-hand lateral housing wall (38) and the right-hand lateral housing wall
(40) are narrower at their top side than at their bottom side.

3. Heating device according to claim 2, in which the respective front sides (44, 46) are situated in the imaginary front face.

4. Heating device according to one of the preceding claims, in which the front (50) of the top housing wall (42) has a convexly curved shape in a top view of the housing (2).

5. Heating device according to one of the preceding claims, in which the cover (4) comprises a front cover wall (64), a top cover wall (66), and a bottom cover wall (68), in which
the top cover wall (66) and the bottom cover wall (68) are each fixedly connected to the front cover wall (64) in a gas-tight manner,
each extend from the front cover wall (64) towards the housing (2) and
each join onto the front of the top housing wall (42) and the housing bottom (34), respectively, in a gas-tight manner with their rear side facing away from the front cover wall (64).

6. Heating device according to claim 5, in which the top cover wall (66) extends further from the front cover wall (64) towards the housing (2) than the bottom cover wall (68).

7. Heating device according to claim 6, in which the top cover wall (66) extends that much further towards the housing (2) than the bottom cover wall (68), that the front cover wall (64) extends substantially vertically in the position of use.

8. Heating device according to one of the preceding claims, in which the cover (4) comprises a left-hand lateral cover wall and a right-hand lateral cover wall (70), each of which is fixedly connected to the front cover wall (64) in a gas-tight manner, each of which extends from the front cover wall (64) towards the housing (2) and each of which joins onto the front side of the left-hand lateral housing wall (38) and the right-hand lateral housing wall (140),
respectively, in a gas-tight manner with a rear side facing away from the front cover wall (64).

9. Heating device according to one of the preceding claims, in which the housing bottom (34) is connected to the left-hand lateral housing wall (38) and the right-hand lateral housing wall (40) at a position between the top and bottom edge of the respective lateral housing wall, as a result of which the respective lateral housing walls extend underneath the housing bottom (34).

10. Method for maintaining a heating device (1) according to one of the preceding claims, comprising the following steps:

removing the cover (4),
carrying out maintenance on at least one of the heating components (6), and replacing the cover (4),

characterized in that
the method furthermore comprises the following steps:

removing the burner (16), and
cleaning the inside of the heat exchanger (18).

Patentansprüche

1. Heizvorrichtung, umfassend ein Gehäuse (2), eine Abdeckung (4) und Heizkomponenten (6), wobei die Heizkomponenten (6) einen Brenner (16), einen Wärmetauscher (18), eine Luftzufuhrleitung (8) und eine Rauchgasabfuhrleitung (10) umfassen,
wobei der Brenner (16) abnehmbar mit einer Oberseite des Wärmetauschers (18) verbunden ist, um ein durch den Wärmetauscher (18) strömendes Medium zu erhitzen, wobei in einer Gebrauchsposition die Abdeckung (4) abnehmbar mit einer Frontseite des Gehäuses (2) verbunden ist, wobei das Gehäuse (2) eine hintere Gehäusewand (36), eine linke seitliche Gehäusewand (38), eine rechte seitliche Gehäusewand (40), eine Gehäuseunterseite (34) und eine obere Gehäusewand (42) umfasst, wobei die linke seitliche Gehäusewand (38), die rechte seitliche Gehäusewand (40), die Gehäuseunterseite (34) und die obere Gehäusewand (42) in einer gasdichten Weise fest mit der hinteren Gehäusewand (36) verbunden sind, sich jeweils von der hinteren

Gehäusewand (36) zur Abdeckung (4) erstrecken und auf den jeweiligen von der hinteren Gehäusewand (36) abgewandten Seiten jeweils eine Frontseite (44, 46, 48, 50) umfassen, und wobei in der Gebrauchsposition die Abdeckung (4) in einer gasdichten Weise an die jeweiligen Frontseiten (44, 46, 48, 50) der linken seitlichen Gehäusewand (38), der rechten seitlichen Gehäusewand (40), der Gehäuseunterseite (34) und der oberen Gehäusewand (42) anschließt, um einen Raum (60) innerhalb des Gehäuses (2) zu schaffen, der in Bezug auf eine Umgebung, in der die Heizvorrichtung installiert ist, gasdicht ist, wobei in dem gasdichte Raum (60) zumindest die Heizkomponenten (6) bereitgestellt sind, wobei durch die jeweiligen Frontseiten (44, 46, 48, 50) der linken seitlichen Gehäusewand (38), der rechten seitlichen Gehäusewand (40), der Gehäuseunterseite (34) und der oberen Gehäusewand (42) eine imaginäre Frontseite (62) definiert ist und wobei sich zumindest ein Teil zumindest einer der Heizkomponenten (6) in der Gebrauchsposition zwischen der imaginären Frontseite (62) und der Abdeckung (4) befindet,
dadurch gekennzeichnet, dass
an der Position einer der seitlichen Gehäusewände (38, 40) sich die obere Gehäusewand (42) weniger weit von der hinteren Gehäusewand (36) in Richtung der Abdeckung (4) erstreckt als sich die Gehäuseunterseite (34) von der hinteren Gehäusewand (36) in Richtung der Abdeckung (4) an der Position derselben der seitlichen Gehäusewände (38, 40) erstreckt, sodass ein Wartungstechniker die Komponenten innerhalb des Gehäuses (2) leicht erreichen kann.

2. Heizvorrichtung nach Anspruch 1, wobei sich in einer Seitenansicht des Gehäuses (2) die jeweiligen Frontseiten (44, 46) der linken seitlichen Gehäusewand (38) und der rechten seitlichen Gehäusewand (40) schräg in Bezug auf die hintere Gehäusewand (36) erstrecken, so dass die linke seitliche Gehäusewand (38) und die rechte seitliche Gehäusewand (40) an ihrer Oberseite schmaler als an ihrer Unterseite sind.

3. Heizvorrichtung nach Anspruch 2, wobei sich die jeweiligen Frontseiten (44, 46) in der imaginären Frontseite befinden.

4. Heizvorrichtung nach einem der vorangehenden Ansprüche, wobei die Front (50) der oberen Gehäusewand (42) in einer Draufsicht auf das Gehäuse (2) eine konvex gekrümmte Form aufweist.

5. Heizvorrichtung nach einem der vorangehenden Ansprüche, wobei die Abdeckung (4) eine vordere Abdeckungswand (64), eine obere Abdeckungswand (66) und eine untere Abdeckungswand (68) umfasst, wobei die obere Abdeckungswand (66) und die untere Abdeckungswand (68) jeweils in einer gasdichten Weise fest mit der vorderen Abdeckungswand (64) verbunden sind, sich jeweils von der vorderen Abdeckungswand (64) zum Gehäuse (2) hin erstrecken und jeweils mit ihrer von der vorderen Abdeckungswand (64) abgewandten Seite in einer gasdichten Weise an die Front der oberen Gehäusewand (42) und der Gehäuseunterseite (34) anschließen.

6. Heizvorrichtung nach Anspruch 5, wobei sich die obere Abdeckungswand (66) weiter von der vorderen Abdeckungswand (64) zum Gehäuse (2) erstreckt als die untere Abdeckungswand (68).

7. Heizvorrichtung nach Anspruch 6, wobei sich die obere Abdeckungswand (66) so viel weiter zum Gehäuse (2) erstreckt als die untere Abdeckungswand (68), dass sich die vordere Abdeckungswand (64) in der Gebrauchsposition im Wesentlichen vertikal erstreckt.

8. Heizvorrichtung nach einem der vorangehenden Ansprüche, wobei die Abdeckung (4) eine linke seitliche Abdeckungswand und eine rechte seitliche Abdeckungswand (70) umfasst, die jeweils in einer gasdichten Weise fest mit der vorderen Abdeckungswand (64) verbunden sind, die sich jeweils von der vorderen Abdeckungswand (64) zum Gehäuse (2) hin erstrecken und die jeweils in einer gasdichten Weise an die Frontseite der linken seitlichen Gehäusewand (38) bzw. der rechten seitlichen Gehäusewand (140) anschließen, wobei eine Rückseite von der vorderen Abdeckungswand (64) abgewandt ist.

9. Heizvorrichtung nach einem der vorangehenden Ansprüche, wobei die Gehäuseunterseite (34) an einer Position zwischen der oberen und der unteren Kante der jeweiligen seitlichen Gehäusewand mit der linken seitlichen Gehäusewand (38) und der rechten seitlichen Gehäusewand (40) verbunden ist, wodurch sich die jeweiligen seitlichen Gehäusewände unterhalb der Gehäuseunterseite (34) erstrecken.

10. Verfahren zum Warten einer Heizvorrichtung (1) nach einem der vorangehenden Ansprüche, umfassend die folgenden Schritte:

Entfernen der Abdeckung (4),
Ausführen der Wartung an zumindest einer der Heizkomponenten (6) und Wiederanbringen der Abdeckung (4),
dadurch gekennzeichnet, dass
das Verfahren ferner die folgenden Schritte umfasst:

Entfernen des Brenners (16) und

Reinigen des Inneren des Wärmetauschers (18).

Revendications

1. Dispositif de chauffage, comprenant un boîtier (2), un couvercle (4) et des composants de chauffage (6), les composants de chauffage (6) comprenant un brûleur (16), un échangeur de chaleur (18), une conduite d'alimentation en air (8) et une conduite d'évacuation des gaz de combustion (10),
le brûleur (16) étant relié de manière amovible à une face supérieure de l'échangeur de chaleur (18) afin de chauffer un milieu qui circule dans l'échangeur de chaleur (18), en position d'utilisation, le couvercle (4) étant relié de manière amovible à une face avant du boîtier (2),
le boîtier (2) comprenant une paroi arrière de boîtier (36), une paroi latérale gauche de boîtier (38), une paroi latérale droite de boîtier (40), un fond de boîtier (34) et une paroi supérieure de boîtier (42), la paroi latérale gauche de boîtier (38), la paroi latérale droite de boîtier (40), le fond de boîtier (34) et la paroi supérieure de boîtier (42) étant chacun reliés à demeure à la paroi arrière de boîtier (36) de manière étanche aux gaz, chacun s'étendant de la paroi arrière de boîtier (36) au couvercle (4) et chacun comprenant une face avant (44, 46, 48, 50) sur les faces respectives opposées à la paroi arrière de boîtier (36), et en position d'utilisation, le couvercle (4) rejoignant les faces avant (44, 46, 48, 50) respectives de la paroi latérale gauche de boîtier (38), de la paroi latérale droite de boîtier (40), du fond de boîtier (34) et de la paroi supérieure de boîtier (42) de manière étanche aux gaz afin de créer un espace (60) à l'intérieur du boîtier (2) qui soit étanche aux gaz par rapport à un environnement dans lequel le dispositif de chauffage est installé, espace étanche aux gaz (60) dans lequel au moins les composants de chauffage (6) sont disposés,
une face avant imaginaire (62) étant définie par les faces avant (44, 46, 48, 50) respectives de la paroi latérale gauche de boîtier (38), de la paroi latérale droite de boîtier (40), du fond de boîtier (34) et de la paroi supérieure de boîtier (42), et au moins une partie d'au moins un des composants de chauffage (6) se trouvant entre la face avant imaginaire (62) et le couvercle (4) en position d'utilisation, **caractérisé en ce que**
à l'emplacement de l'une des parois latérales de boîtier (38, 40), la paroi supérieure de boîtier (42) s'étend moins loin de la paroi arrière de boîtier (36) vers le couvercle (4) que le fond de boîtier (34) ne s'étend de la paroi arrière de boîtier (36) vers le couvercle (4) à l'emplacement de la même paroi latérale de boîtier (38, 40), de sorte qu'un technicien de maintenance peut facilement atteindre les composants à l'intérieur du boîtier (2).

2. Dispositif de chauffage selon la revendication 1, le boîtier (2) étant vu de côté, les faces avant (44, 46) respectives de la paroi latérale gauche de boîtier (38) et de la paroi latérale droite de boîtier (40) s'étendant obliquement par rapport à la paroi arrière de boîtier (36) de sorte que la paroi latérale gauche de boîtier (38) et la paroi latérale droite de boîtier (40) soient plus étroites au niveau de leur face supérieure qu'au niveau de leur face inférieure.

3. Dispositif de chauffage selon la revendication 2, les faces avant (44, 46) respectives étant situées dans la face avant imaginaire.

4. Dispositif de chauffage selon l'une des revendications précédentes, la face (50) de la paroi supérieure de boîtier (42) ayant une forme courbée de manière convexe, le boîtier (2) étant vu de dessus.

5. Dispositif de chauffage selon l'une des revendications précédentes, le couvercle (4) comprenant une paroi de couvercle avant (64), une paroi de couvercle supérieure (66) et une paroi de couvercle inférieure (68),
la paroi de couvercle supérieure (66) et la paroi de couvercle inférieure (68) étant chacune reliées à demeure à la paroi de couvercle avant (64) de manière étanche aux gaz,
chacune s'étendant de la paroi de couvercle avant (64) vers le boîtier (2) et
chacune rejoignant respectivement l'avant de la paroi supérieure de boîtier (42) et du fond de boîtier (34), de manière étanche aux gaz, leur face arrière étant tournée à l'opposé de la paroi avant de couvercle (64).

6. Dispositif de chauffage selon la revendication 5, la paroi de couvercle supérieure (66) s'étendant plus loin de la paroi de couvercle avant (64) vers le boîtier (2) que la paroi de couvercle inférieure (68).

7. Dispositif de chauffage selon la revendication 6, la paroi de couvercle supérieure (66) s'étendant aussi loin vers le boîtier (2) que la paroi de couvercle inférieure (68), de sorte que la paroi de couvercle avant (64) s'étende sensiblement verticalement en position d'utilisation.

8. Dispositif de chauffage selon l'une des revendications précédentes, le couvercle (4) comprenant une paroi latérale gauche de couvercle et une paroi latérale droite de couvercle (70), chacune étant reliée à demeure à la paroi avant de couvercle (64) de manière étanche aux gaz, chacune s'étendant de la paroi avant de couvercle (64) vers le boîtier (2) et chacune rejoignant la face avant de la paroi latérale gau-

che de boîtier (38) et de la paroi latérale droite de boîtier (140), respectivement, de manière étanche aux gaz avec une face arrière tournée à l'opposé de la paroi avant de couvercle (64) .

9. Dispositif de chauffage selon l'une des revendications précédentes, le fond de boîtier (34) étant relié à la paroi latérale gauche de boîtier (38) et à la paroi latérale droite de boîtier (40) à un endroit situé entre le bord supérieur et le bord inférieur de la paroi latérale de boîtier respective, de sorte que les parois latérales de boîtier respectives s'étendent sous le fond de boîtier (34).

10. Procédé d'entretien d'un dispositif de chauffage (1) selon l'une des revendications précédentes, comprenant les étapes consistant à :

retirer le couvercle (4),
effectuer l'entretien d'au moins un des composants de chauffage (6) et remettre en place le couvercle (4),
caractérisé en ce que
le procédé comprend en outre les étapes consistant à :

retirer le brûleur (16), et
nettoyer l'intérieur de l'échangeur de chaleur (18) .

Fig.1

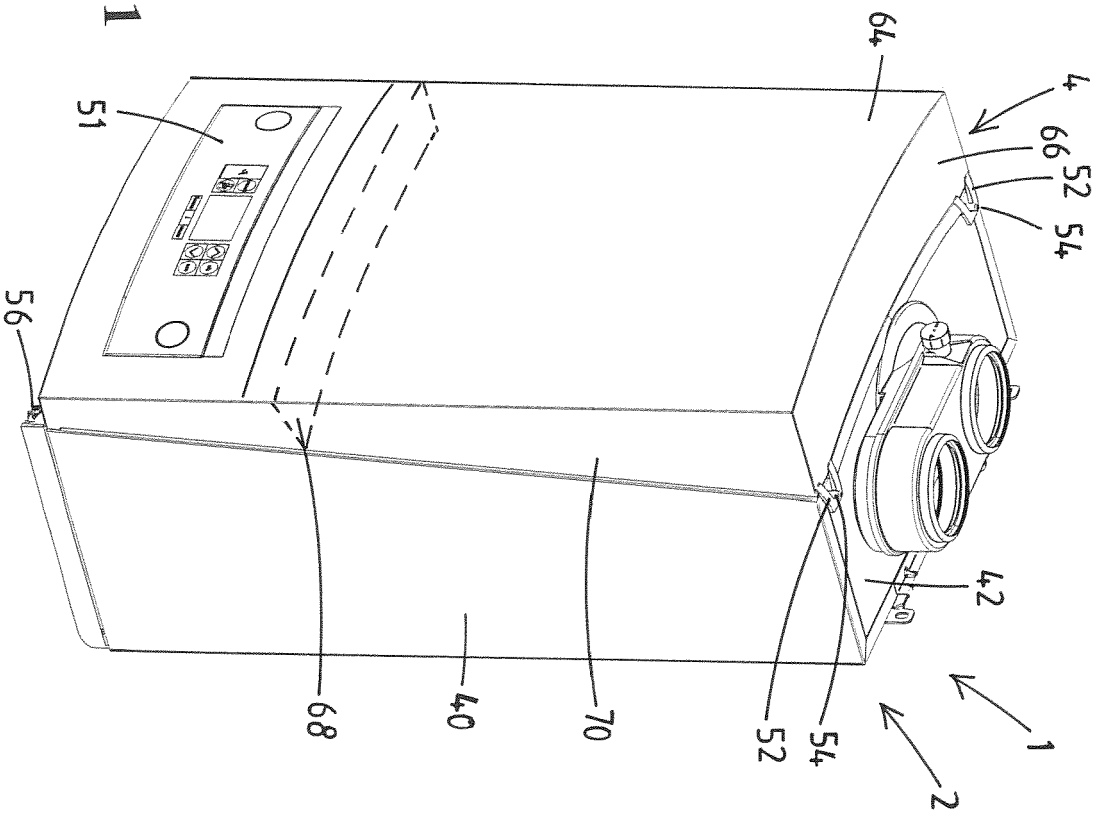

64
4
66
52
54
51
56
42
68
40
70
52
54
1
2

Fig.2

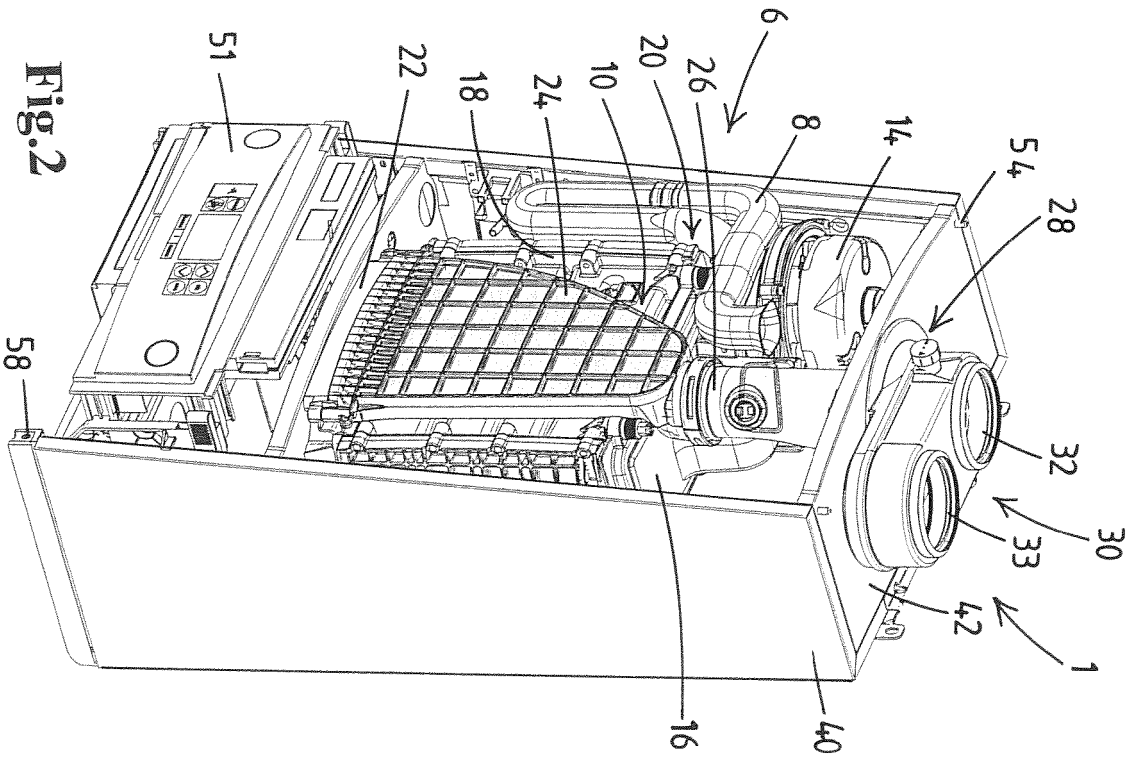
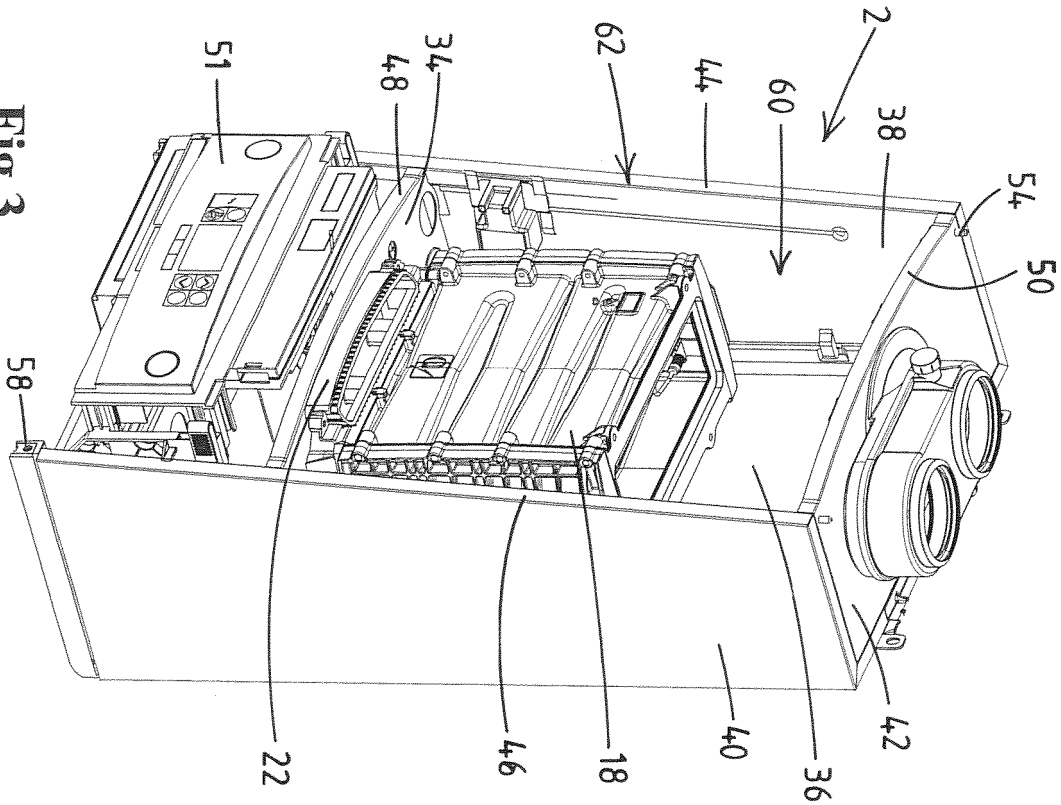

6
51
22
18
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20
26
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54
28
58
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42
1
16
40

Fig.3



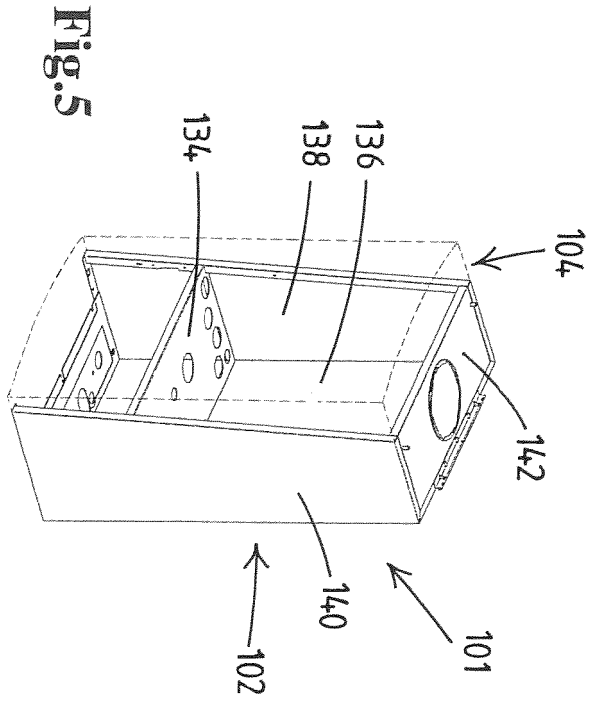


Fig.5

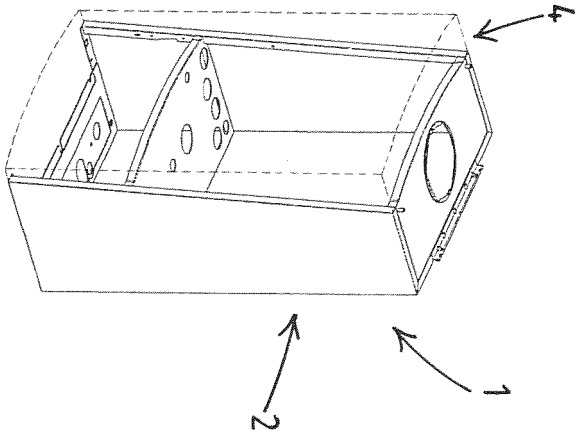


Fig.4

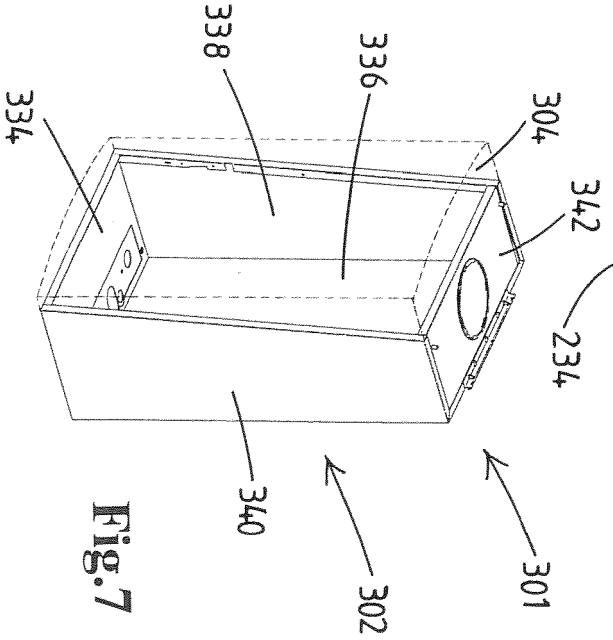


Fig.7

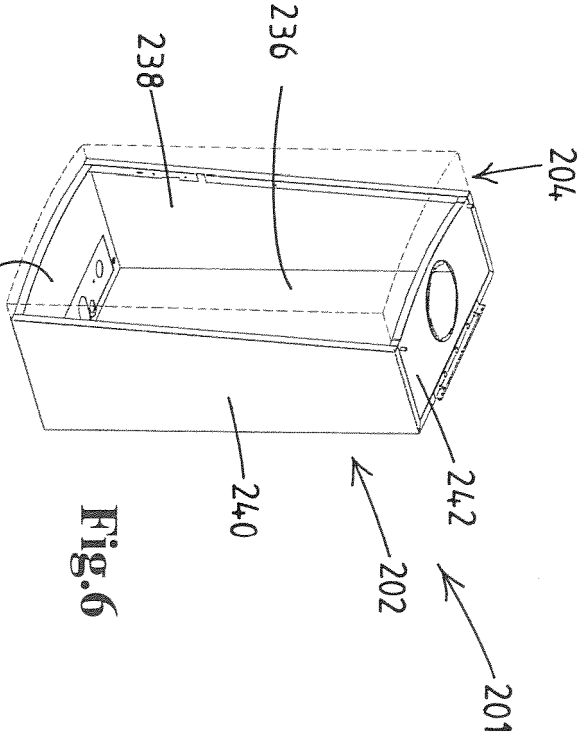


Fig.6

REFERENCES CITED IN THE DESCRIPTION

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