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Remarks:

Amended claims in accordance with Rule 137(2) EPC.

(54) Manifold arrangement, burner arrangement and fireplace

(57) The invention relates to a fireplace comprising a burner arrangement (16), a frame (25, 26, 27, 28, 29) and a protective transparent shield. The burner arrangement (16) comprises a manifold arrangement (1), a tube arrangement (21, 23), a pump (22) and a fuel reservoir (17). The manifold arrangement (1) comprises a manifold (2), a tray (3), a number of manifold supports (4) and a fuel conduit (5). The manifold (2) is shaped as an elongated member comprising first and second sealed end

sections (7,8) and being provided with an elongated cavity (12) along the length of the manifold. It is further provided with a longitudinal opening (13) providing access to the cavity (12). The fuel conduit (4) is connected to an inlet in the middle section (9) of the manifold (2) through a corresponding inlet in the tray (3) and is connectable to an associated fuel pipe (23) suitable for providing fuel to the manifold arrangement by means of an associated fuel pump (22).

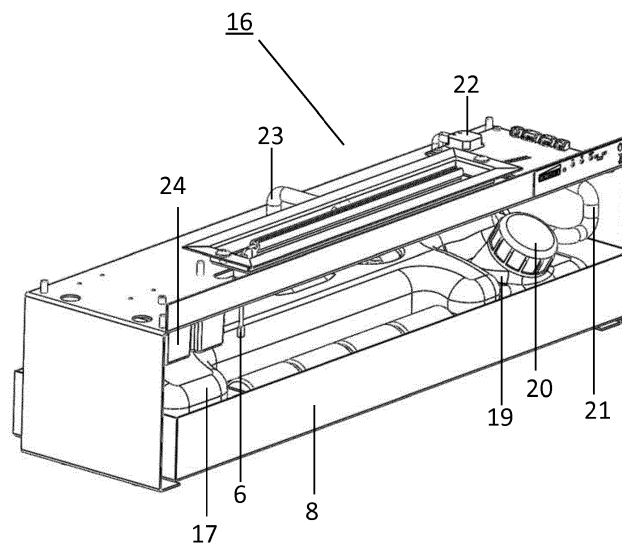


Fig. 3

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to a manifold arrangement and a burner arrangement for use in a fireplace and a fireplace with such manifold arrangement and burner arrangement, where the heat source is a liquid fuel such as biofuel, ethanol, other alcohols, fossil fuels or other.

BACKGROUND OF THE INVENTION

[0002] Fireplaces with burners using liquid fuels, such as biofuels or ethanol are constructed to create a flame appearance close to flames resulting from burning wood, and to provide heat.

[0003] The present fireplaces using liquid fuels such as ethanol are in general made with a combined reservoir and burner. The user fills ethanol into the same place from where the flame is burning. This presents a security risk, as ethanol is a highly inflammable combustible, and the bottle can ignite if there is only a minor, sometimes invisible, flame present in the burner. With the present fireplaces there have been accidents where the user has poured ethanol into the reservoir while there have been a flame left in it, which has ignited the ethanol and caused an uncontrolled fire.

[0004] Furthermore, the present burners often contain several decilitres of liquid fuel in the burner. This can lead to fuel fumes coming out into the room, also when the fireplace is not in use, which can be a potential security risk if the fireplace tilts or tips over or falls, as fuel from the combined burner and reservoir can flow out. The amount of fuel present in the burner also necessitates a long time before the fire is put out, which can cause some smell from ethanol fumes when the burner is still hot after the flame is put out.

OBJECT OF THE INVENTION

[0005] It is an object of the present invention to improve the safety of fireplaces provided with burners using liquid fuels such as biofuel, ethanol or the like.

[0006] It is also an object to present a burner where the flame is put out faster than on prior art burners.

[0007] These and other objectives are obtained by providing a manifold in the burner arrangement where only a small amount of fuel is present at any time, and by separating the burner and reservoir in such a way that it is ensured that it is not possible to get ignition due to incorrect use. The small amount of fuel present in the manifold arrangement during use will burn out automatically and quickly when the fuel feed to the manifold is cut. Thereby there is no fuel residues in the burner arrangement, which can evaporate and give fuel fumes in the surroundings of the burner arrangement.

[0008] Furthermore, the provision of an air gap be-

tween the manifold containing fuel and the surrounding tray lifts the combustion process and leads to an improved radiation to the surroundings and a smaller energy loss due to heating of the elements of the burner and fireplace. This will lead to a lower temperature in the structural elements of the manifold and burner arrangement than temperatures found in prior art fireplaces. When the flames are put out, the manifold will rapidly reach the ambient temperature. This gives a further assurance against uncontrolled ignition of fuel on or in the elements of the burner arrangement.

[0009] It is a further object of the present invention to provide an alternative to the prior art, such as providing an improved flexibility and more possibilities related to the design of fireplaces, the manifold and burner arrangement of such fireplaces and flame design in such fireplaces.

[0010] These objects are achieved by means of the features of the independent claims. The dependent claims further develop the concepts of the present invention.

SUMMARY OF THE INVENTION

[0011] The invention relates to a manifold arrangement, suitable for a liquid fuel fireplace, comprising a manifold, a tray, a number of manifold supports and a fuel conduit, the manifold being shaped as an elongated member comprising first and second sealed end sections and being provided with an elongated cavity along the length of the manifold, the manifold is further provided with at least one longitudinal opening providing access to the cavity, an elongated spreading member is arranged in and parallel with the manifold, the fuel conduit is connected to an inlet in the middle section of the manifold through a corresponding inlet in the tray, the manifold is mounted in the tray by means of the manifold supports creating a gap between the manifold and the tray, the fuel conduit is connectable to an associated fuel pipe suitable for providing fuel to the manifold arrangement by means of an associated fuel pump.

[0012] As the manifold arrangement is separated from the fuel reservoir, and is only fed with a controlled amount of fuel through the fuel conduit, there will be a controlled, and preferably small, amount of fuel in the manifold when it is ignited. This enables an improved control of the burning temperature in and on the manifold. The gap between the manifold and the tray provides natural cooling of the manifold, which also leads a lower temperature in the manifold elements during use.

[0013] In one aspect, the manifold arrangement is provided with an igniter being arranged adjacent to one end section of the manifold and with a droplet channel through the end plug of the adjacent end section, so that one or more fuel droplets can exit the droplet channel and be lighted by means of the igniter. The igniter can be remotely controlled.

[0014] The remotely controlled igniter enables the user

to light a fire without having to approach a burner arrangement filled with fuel and possibly fuel fumes. This also improves the safety of the manifold arrangement, as it prevents a possible uncontrolled ignition of fuel fumes. The igniter should advantageously be interconnected with the control system of the fuel supply, which makes it possible to time the ignition to start when a pre-defined, and preferably optimal, amount of fuel is present in the manifold arrangement.

[0015] In one embodiment of the manifold arrangement, the manifold is a tubular element with a mainly circular cross section provided with a longitudinal incision. The manifold can also be formed by longitudinal side walls forming a cornered cross section, such as a V-shape, a rectangle, a pentagon or polygon and be provided with a spreading member of a corresponding cross section.

[0016] The flexibility of the design of the manifold element, leads to an improved freedom for the designer of a fireplace, as it is possible to design different flame appearances by altering the cross section of the manifold element, while still maintaining the improved safety as explained above.

[0017] In one embodiment of the manifold arrangement, the fuel conduit is branched into two or more fuel conduit branches which lead fuel to two or more inlets arranged over the length of the manifold and tray. In another embodiment the fuel pipe supplying the manifold element with fuel, is divided into two or more branches being connected to two or more fuel conduits, which lead fuel to two or more inlets arranged over the length of the manifold and tray. When fuel is supplied through multiple inlets to the manifold it is possible to feed even smaller amounts of fuel through each inlet, further lowering the fuel flow into the manifold, enabling a quick burnout of fuel residues in the manifold element.

[0018] The manifold element and spreading member are preferably narrow and elongated with a length substantially larger than the breadth, as this leads to a good spreading of a small amount of fuel. The length of the manifold and spreading member is for example at least 4 times the breadth of the two parts, more preferably at least 7 times the breadth, more preferably at least 10 times the breadth or even at least 20 times the breadth of the manifold and spreading member.

[0019] The manifold can also be provided with one or more elongated branches, each branch being provided with an elongated cavity, a longitudinal opening and a sealed end section. In one embodiment of the manifold arrangement, the manifold has the shape of a curve or branched line, with one or more curvatures. A curved or wavy manifold will lead to a somewhat different flame picture, which can be desirable for the designer of a fireplace.

[0020] The invention further relates to a burner arrangement comprising a manifold arrangement as mentioned above, a tube arrangement, a pump and a fuel reservoir, where the manifold arrangement is connected

to the tube arrangement in such a way that fuel can pass from the tube arrangement into the manifold arrangement and where the fuel reservoir is connected to the tube arrangement in such a way that fuel can pass from the reservoir into the tube arrangement. The pump is connected to the tube arrangement in such a way that it can provide a forward thrust for fuel flowing in the tube arrangement between the reservoir and the manifold arrangement.

[0021] The pump can advantageously be a diaphragm pump. As the manifold arrangement and fuel reservoir are separated by a tube arrangement and a pump, there is no direct contact between the flame in an ignited manifold and the fuel reservoir located in the environment of the manifold arrangement. This minimises or even removes the possibility of a remaining flame in or on the manifold element, unintentionally igniting fuel in the reservoir or fuel fumes in or surrounding the reservoir.

[0022] In one aspect of the invention, both the igniter and flow rate of the fuel being provided to the manifold arrangement, preferably by means of the pump, are remotely controlled. As the flow rate of the fuel supply can be controlled during use, it is possible to regulate the flame size or appearance and the heat output of the fire, during use of the fireplace in a simple manner.

[0023] In one embodiment of the burner arrangement, the fuel reservoir is located in a shelf or slidable drawer. The reservoir can for example be arranged below the manifold arrangement. If there is a failure in the control system of the burner arrangement, fuel present in the fuel tubing will naturally flow downwards back into the reservoir. This gives a further safety precaution against unwanted fuel residues or fuel fumes in the elements of the burning arrangement.

[0024] The invention also relates to a fireplace comprising one of the above mentioned burner arrangement as mentioned, a frame and a protective transparent shield. The burner arrangement can advantageously be arranged mainly in or on a slidable drawer, and a removable cover can cover at least a part of the burner arrangement. A fireplace according to the invention will thereby be able to combine a flexible and decorative design with a comprehensive system of safety precautions.

[0025] In one embodiment of the fireplace, at least a part of the frame is transparent. This is advantageous if the fireplace is a free standing decorative fireplace, where the fireplace can be viewed from all sides. As there is only a small amount of fuel present in the upper visible parts of the fireplace, the risk of burn injuries due to unexpected behaviour around the fireplace is reduced to an absolute minimum. If the fireplace is bounced into, tilted or in any other way moved during use, the supply of fuel will be stopped by means of a control system and the small amount of burning fuel present in or on the manifold element will burn out quickly without causing an uncontrolled fire which can lead to injuries.

[0026] In another embodiment, the fireplace comprises a wall mounting arrangement, so that the fireplace can

be mounted on a wall. A low burning temperature in the manifold arrangement ensures that the surroundings of the burner arrangement and thereby the fireplace elements are not significantly heated during use. Thereby, the wall behind the fireplace will not be affected by the heat produced in the burner arrangement of the fireplace, leading to a fireplace with good safety related to unintentional heating of the surroundings.

BRIEF DESCRIPTION OF THE FIGURES

[0027] The manifold arrangement, burner arrangement and fireplace according to the invention will now be described in more detail with regard to the accompanying figures. The figures show one way of implementing the present invention and is not to be construed as being limiting to other possible embodiments falling within the scope of the attached claim set.

Figure 1 shows a cross sectional view of a manifold arrangement according to an embodiment of the present invention.

Figure 2 shows an exploded view showing some of the elements forming a burner arrangement according to an embodiment of the present invention.

Figure 3 shows a perspective view of a first embodiment of a burner arrangement according to an embodiment of the present invention.

Figure 4 shows a cross sectional view of a second embodiment of a burner arrangement according to an embodiment of the present invention.

Figure 5 shows a perspective view of a fireplace provided with a burner arrangement according to an embodiment of the present invention.

Figure 6 shows a cross sectional view of a fireplace provided with a burner arrangement according to an embodiment of the present invention.

DETAILED DESCRIPTION

[0028] Figure 1 shows a cross sectional view of a manifold arrangement 1 according to the present invention. The manifold arrangement is suitable for mounting in a burner arrangement as shown in fig. 3. The manifold arrangement holds, distributes and burns liquid fuel. When mounted in a fireplace, the manifold arrangement will be the visible part of the burner arrangement from where the flames rises during use. The burner arrangement will be further explained in relation to figs. 3 and 4.

[0029] The manifold arrangement 1 comprises a manifold 2, a tray 3, a number of manifold supports 4, a fuel conduit 5 and an igniter 6. The manifold 2 is arranged in the tray 3 in such a way that there is an air gap between

the manifold 2 and the tray 3, i.e., the manifold is lifted up over the bottom of the tray and is surrounded by an air gap in the tray. As the manifold is lifted up from above the lower part of the tray, the heat generated in the manifold will radiate outwards to the surroundings instead of heating the elements of the fireplace. The air gap also contributes to cooling of the manifold element 2. Furthermore, if there is an overflow of fuel from the manifold element 2, the excessive fuel can drip down onto the tray where it can spread out and evaporate.

[0030] To maintain a gap between the manifold and the tray, the manifold is supported by a number of manifold supports 4, holding the manifold in a predefined distance from the side walls and bottom surface of the tray. The manifold supports 4 can be screws being screwed into the tray 3 and further into the manifold 2. It is an advantage to provide manifold supports that can be adjusted, so that the distance from the bottom of the tray to the manifold can be adjusted even after the burner arrangement is mounted in a fireplace. The tray also presents a further barrier between the manifold 2 and the reservoir providing fuel to the manifold arrangement.

[0031] The manifold of the shown embodiment has a first and second end section 7, 8 and a middle section 9. The manifold 2 is shaped as an elongated member comprising sealed end sections 7, 8 and an elongated cavity 12. The manifold 2 is further provided with at least one longitudinal opening 13, such as an incision, providing access to the cavity 12 of the manifold. Fuel rising from the incision is lighted and will form the flames in a fireplace with the manifold arrangement. If the form of the incision is altered, the flame appearance can be altered accordingly. The number of openings or incisions and the distance between the openings, if there is more than one, will affect the flame appearance, e.g. if there is a continuous flame or a number of more or less distinct flames, etc.

[0032] There is an inlet 10 in the middle section 9 of the manifold. The fuel conduit 5 is connected to the inlet 10. One of the end sections 7 is provided with a narrow droplet channel 11, such as a capillary tube or other conduit having a very small passage. When fuel is flowing into the manifold, it will spread out over the length of the manifold element 2. Some of the fuel reaching the droplet channel 11 will flow out through the channel and form droplets. Next to the end section 7 provided with the droplet channel, there is an igniter 6. The droplets are exiting the droplet channel adjacent to the igniter 6. Sparks from the igniter will light the droplets which again light fuel fumes rising from the incision of the manifold, thereby "starting" the fire in the fireplace.

[0033] The igniter can be a piezoelectric igniter and is advantageously remotely operated. As the fireplace can be lighted by means of a remote control, there is no need for direct contact between the owner of a fireplace provided with the manifold arrangement, and the fuel or fuel fumes in or to some extent surrounding the manifold arrangement. This is an advantage, as it removes a pos-

sible risk of burn damages.

[0034] Figure 2 shows an exploded view showing some of the elements forming a burner arrangement, such as manifold supports 4, fluid conduit 5, tray 3, manifold 2, spreading member 14 and end plugs 15, one being provided with a droplet channel 11. The spreading member 14 is arranged in the cavity of the manifold 2, in such a way that the spreading member 14 is in fluid contact with the inlet 10. Thereby, the fluid can be led into the manifold via the fluid conduit 5 and fluid inlet 10, and further to the spreading member 14. The spreading member ensures an even distribution of the fuel over the length of the manifold 2. Thereby, the fuel can be distributed over the spreading member throughout the length of the manifold 2 ensuring an even flame when the fuel is lighted.

[0035] When a user wants to light a fire in a fireplace provided with a manifold arrangement according to the invention, fuel is allowed to flow into the manifold and spreading member via the fluid conduit and the inlet. The droplet channel 11 at one end section 7 of the manifold 2 enables small drops or droplets of fuel to leak out from the manifold. When the manifold 2 is filled with fuel, some drops will drip out from the droplet channel 11 next to the igniter 6, and fuel fumes will surround the manifold. Sparks from the igniter will light the fuel drops which then again will light the fuel fumes in and on the manifold, thereby providing a decorative flame over the length of the manifold arrangement. The igniter is connected to a control means controlling the flow rate of the fuel being provided to the manifold element, so that ignition can start when a predefined amount of fuel is filled into the cavity of the manifold. If, for some reason, the igniter is not used, it is also possible to light the fuel by means of a lighter or matches. In such a case, the provision of fuel is controlled independently of the igniter.

[0036] Figure 3 shows a perspective view of a first embodiment of a burner arrangement 16 according to the present invention. A fuel reservoir 17 is arranged in a drawer 18. The reservoir has a filling stub 19 provided with a bonnet 20, such as a screw cap. A first fuel hose or pipe 21 leads fuel from the reservoir 17 towards and into a pump 22, a second fuel pipe 23 leads the fuel from the pump and towards the manifold arrangement 1. A power source 24 provides voltage to the igniter 6, so that the igniter can lighten the fuel pumped into the manifold and spreading member, to the control system of the burner arrangement and a variety of safety arrangement. This will be further explained below. The power source 24 can advantageously be one or more batteries.

[0037] When a user wants to fill the reservoir, it can be pulled out by means of the drawer. The burner arrangement can be provided with a safety connection on one of the pipes or the pump, which is disconnected when the reservoir is drawn out from its operational position. This will provide a complete disconnection of the reservoir from the manifold arrangement, so that any possible remaining flames in the manifold arrangement cannot

come in contact with the fuel being filled into the reservoir.

[0038] Figure 4 shows a cross sectional view of a second embodiment of a burner arrangement according to the present invention. The shown embodiment has an enlarged fuel reservoir 17 and an increased spacing between the reservoir and the manifold arrangement 1. The increased spacing leads to a longer distance from the fuel reservoir to the flames, when the fuel is burning, which provide a further improvement of the safety of a fireplace provided with a biofuel burner arrangement.

[0039] The second fuel pipe 23 is connected to the fuel conduit 5, which again enters the tray 3 and manifold 2. The spreading member 14 is arranged in the manifold 2. The spreading member 14 is a rod around which the fuel will spread out so that there is a large amount of fuel fumes compared to the amount of liquid fuel. This way, the present amount of fuel can be lowered, while the desired amount of flames are maintained.

[0040] Figure 5 shows a perspective view of an example of fireplace provided with a burner arrangement according to the present invention. At least a part of the burner arrangement is arranged behind a cover 34 in a shelf or slidable drawer 18. The cover can be removed or opened to access the shelf or drawer containing the fuel reservoir and burner arrangement. The reservoir is preferably arranged on a slidable drawer (not shown), so that the reservoir can be slid out from beneath the manifold arrangement. When the reservoir is pulled out, the burner arrangement can be constructed in such a way that the contact between the manifold arrangement and the reservoir is cut off. This provides a further safety precaution to ensure that there is not any possible flame that can come in contact with the fuel being filled into the reservoir. If the reservoir is arranged on a shelf, removal of the cover provides access to the filling stub 19, and the reservoir can be filled in-situ.

[0041] The fireplace is further provided with sidewalls 25, a top plate 26, back plate 27, a floor plate 28 and a front frame 29. There is also a protective shield in front of the manifold arrangement, not shown on the drawing. The protective shield is transparent.

[0042] On a fireplace according to the present invention, there is no need to access the manifold arrangement as long as the igniter is used to lighten the fire. Furthermore, the fuel is filled into the reservoir being distanced from the parts holding the decorative flames and having a filling stub being situated on the outside of the protective shield. Due to this, the protective shield can be attached in such a way that it demands some effort to remove the shield. In this way, it is ensured that an imprudent user cannot pour fuel directly onto the manifold arrangement without going through great difficulty.

[0043] Figure 6 shows a cross sectional view of a fireplace provided with a burner arrangement according to the present invention. The size and form of the fuel reservoir can be altered to fit into fireplaces of various designs without departing from the scope of the invention. It is an advantage to provide a venting means, such as

ventilation apertures 30, in the upper part of the fireplace. The fuel reservoir can also be arranged on one of the sides of the fireplace, in connection with one of the side frames, if desirable.

[0044] It is an advantage if the temperature in the manifold is kept around 60 °C, when there is a fire in the burner arrangement, as this will give a decorative and stable flame and a low temperature in the elements surrounding the manifold. However, the dimensions or other arrangement of the manifold can be adjusted, and it is also conceivable to adjust the rate of the inflow of fuel, to obtain a lower or higher burning temperature.

[0045] It should be noted that even if the presented embodiment is provided with one fuel inlet, it is also possible to provide two or more fuel inlets into the manifold. In such a case, the conduit leading the fuel from the pump towards the manifold fuel inlets, is branched into a number of branches corresponding with the number of inlets in the manifold. In such a case, it is advantageous to enforce the efficiency of the fuel pump.

[0046] It is an advantage of the present invention that the flame and output of the manifold is easily controlled. As there is only a small amount of fuel present in the manifold, the flow rate of the fuel to the manifold, can be used to control the size and output of the flames. The small amount of fuel also leads to a quick response to changes in flow rate of the fuel, leading to an easy control of the change in flame appearance when changing the flow rate of the fuel.

[0047] As the incision in the manifold, from which the fuel fumes and flames rises, is narrow compared to prior art burner arrangement, the flames will form a thinner flame line, which can be manipulated more easily compared to prior art biofuel fireplaces, both with regard to the form of the manifold and/or spreading element and inflow of fuel to the manifold arrangement.

[0048] The small amount of fuel present in the burner arrangement also allows the manufacturer to arrange one or more batteries in the burner arrangement e.g. to control the pump of the burner arrangement and run the control circuit, various sensors and/or safety valves.

[0049] A fireplace provided with a burner arrangement according to the invention will normally be equipped with a number of sensors ensuring safety of the fire place, such as a sensor detecting tilting of the fireplace, a sensor detecting the amount of CO₂ in the fireplace and surroundings of the fireplace, sensors measuring the temperature of elements being heated or being affected by heat from the flames of the fireplace, a sensor detecting the level of fuel in the fuel reservoir, e.g. a fuel flooding sensor, a fuel flow sensor, a sensor or flow meter measuring the amount of fuel exiting the reservoir and the amount of fuel entering the manifold, etc.

[0050] The sensors are connected to the control circuit, so that the pump can be stopped if a critical or unwanted situation should arise, e.g. if someone bumps into the fireplace destabilizing the system, if a draft puts out the fire in or on the manifold arrangement, if aeration of the

surroundings is insufficient, if there is a leak in the system or an uncontrolled fire, etc. The pump should also be stopped if the fuel reservoir reaches a predefined critical level it should be filled, or if the reservoir is empty.

[0051] It has here been described a fireplace comprising a burner arrangement (16), a frame (25, 26, 27, 28, 29) and a protective transparent shield. The burner arrangement (16) comprises a manifold arrangement (1), a tube arrangement (21, 23), a pump (22) and a fuel reservoir (17). The manifold arrangement (1) comprises a manifold (2), a tray (3), a number of manifold supports (4) and a fuel conduit (5). The manifold (2) is shaped as an elongated member comprising first and second sealed end sections (7,8) and being provided with an elongated cavity (12) along the length of the manifold. The manifold is further provided with a longitudinal opening (13) providing access to the cavity (12). The fuel conduit (4) is connected to an inlet in the middle section (9) of the manifold (2) through a corresponding inlet in the tray (3) and is connectable to an associated fuel pipe (23) suitable for providing fuel to the manifold arrangement by means of an associated fuel pump (22).

[0052] An elongated spreading member can advantageously be arranged in the manifold.. The manifold is furthermore mounted in the tray by means of the manifold supports creating a gap between the manifold and the tray.

[0053] The described fireplace is normally using a liquid fuel as combustible. The liquid fuel can advantageously be a biofuel such as ethanol or another suitable alcohol. However, it is also conceivable to use other liquid fuels, such as fossil fuels or other inflammable chemical or organic compounds.

[0054] Although the present invention has been described in connection with the specified embodiments, it should not be construed as being in any way limited to the presented examples. The scope of the present invention is set out by the accompanying claim set. In the context of the claims, the terms "comprising" or "comprises" do not exclude other possible elements or steps. Also, the mentioning of references such as "a" or "an" etc. should not be construed as excluding a plurality. The use of reference signs in the claims with respect to elements indicated in the figures shall also not be construed as limiting the scope of the invention. Furthermore, individual features mentioned in different claims, may possibly be advantageously combined, and the mentioning of these features in different claims does not exclude that a combination of features is not possible and advantageous.

Claims

1. A manifold arrangement (1), suitable for a liquid fuel fireplace, comprising a manifold (2), a tray (3), a number of manifold supports (4) and a fuel conduit (5), the manifold (2) being shaped as an elongated

- member comprising first and second sealed end sections (7,8) and being provided with an elongated cavity (12) along the length of the manifold, the manifold (2) is further provided with at least one longitudinal opening (13) providing access to the cavity (12),
 an elongated spreading member (14) is arranged in and parallel with the manifold,
 the fuel conduit (4) is connected to an inlet in the middle section (9) of the manifold (2) through a corresponding inlet in the tray (3),
 the manifold (2) is mounted in the tray (3) by means of the manifold supports (4) creating a gap between the manifold (2) and the tray (3),
 the fuel conduit is connectable to an associated fuel pipe (23) suitable for providing fuel to the manifold arrangement by means of an associated fuel pump (22).
2. The manifold arrangement according to claim 1, further comprising an igniter (6) being provided adjacent to one end section (7) of the manifold (2) and a droplet channel (11) being arranged through the end plug (15) of the adjacent end section, so that one or more fuel droplets can exit the droplet channel and be lighted by means of the igniter (6).
 3. The manifold arrangement according to claim 1, with the manifold (2) being a tubular element with a mainly circular cross section provided with a longitudinal incision (13), or the manifold (2) being formed by longitudinal side walls forming a cornered cross section, such as a V-shape, a rectangle, a pentagon or polygon and the manifold (2) being provided with a spreading member (14) of a corresponding cross section.
 4. The manifold arrangement according any of the claims 1-3, with the fuel conduit (5) being branched into two or more fuel conduit branches (5) which lead fuel to two or more inlets (10) arranged over the length of the manifold (2) and tray (3), or the fuel pipe (23) being divided into two or more branches being connected to two or more fuel conduits (5) which lead fuel to two or more inlets (10) arranged over the length of the manifold (2) and tray (3).
 5. The manifold arrangement according to any of the proceeding claims, wherein the manifold element and spreading member are narrow and elongated with a length substantially larger than the breadth..
 6. The manifold arrangement according to any of the proceeding claims, the manifold (2) being provided with one or more elongated branches, each branch being provided with an elongated cavity (12), a longitudinal opening (13) and a sealed end section (7,8).
 7. The manifold arrangement according to any of the proceeding claims, the manifold (2) having the shape of a curve or branched line, with one or more curvatures.
 8. A burner arrangement (16) comprising a manifold arrangement (1) according to any of the proceeding claims, a tube arrangement (21, 23), a pump (22) and a fuel reservoir (17),
 the manifold arrangement (1) being connected to the tube arrangement (21, 23) in such a way that fuel can pass from the tube arrangement into the manifold arrangement (1),
 the fuel reservoir (17) is connected to the tube arrangement (21, 23) in such a way that fuel can pass from the reservoir (17) into the tube arrangement, the pump (22) being connected to the tube arrangement in such a way that it can provide a forward thrust for fuel flowing in the tube arrangement between the reservoir (17) and the manifold arrangement.
 9. A burner arrangement according to claim 8, wherein the pump is a diaphragm pump.
 10. A burner arrangement according to claim 8 or 9, wherein the igniter (6) and flow rate of the fuel being provided to the manifold arrangement by means of the pump, are remotely controlled.
 11. A burner arrangement according to any of the claims 8 to 10, the fuel reservoir being located in a shelf or slidable drawer (17).
 12. A burner arrangement according to any of the claims 8-11, the reservoir (17) being arranged below the manifold arrangement (1).
 13. A fireplace comprising a burner arrangement (16) according to any of the claims 8-11, a frame (25, 26, 27, 28, 29) and a protective transparent shield.
 14. A fireplace according to claim 13, the burner arrangement (16) being arranged mainly in or on a slidable drawer, the fireplace further comprising a removable cover covering the burner arrangement.
 15. A fireplace according to claim 13 or 14, with at least a part of the frame being transparent.
 16. A fireplace according to any of the claims 12 to 15, further comprising a wall mounting arrangement.
- Amended claims in accordance with Rule 137(2) EPC.**
1. A manifold arrangement (1), suitable for a liquid

fuel fireplace, comprising a manifold (2), a tray (3), a number of manifold supports (4) and a fuel conduit (5), the manifold (2) being shaped as an elongated member comprising first and second sealed end sections (7,8) and being provided with an elongated cavity (12) along the length of the manifold, the manifold (2) is further provided with at least one longitudinal opening (13) providing access to the cavity (12), the fuel conduit (4) is connected to an inlet in the middle section (9) of the manifold (2) through a corresponding inlet in the tray (3), the manifold (2) is mounted in the tray (3) by means of the manifold supports (4) creating a gap between the manifold (2) and the tray (3), the fuel conduit is connected, when in use, to an associated fuel pipe (23) suitable for providing fuel to the manifold arrangement by means of an associated fuel pump (22), **characterized in that** an elongated spreading member (14) is arranged in and parallel with the manifold, wherein the manifold (2) and the spreading member are having a length which is at least 10 times of a breadth the manifold (2) and the spreading member and wherein the spreading member is a rod around which the fuel will spread out so there is a large amount of fuel fume compared to the amount of liquid fuel, when the manifold arrangement is in use.

2. The manifold arrangement according to claim 1, further comprising an igniter (6) being provided adjacent to one end section (7) of the manifold (2) and a droplet channel (11) being arranged through the end plug (15) of the adjacent end section, so that one or more fuel droplets can exit the droplet channel and be lighted by means of the igniter (6).

3. The manifold arrangement according to claim 1, with the manifold (2) being a tubular element with a mainly circular cross section provided with a longitudinal incision (13), or the manifold (2) being formed by longitudinal side walls forming a cornered cross section, such as a V-shape, a rectangle, a pentagon or polygon and the manifold (2) being provided with a spreading member (14) of a corresponding cross section.

4. The manifold arrangement according to any of the claims 1-3, with the fuel conduit (5) being branched into two or more fuel conduit branches (5) which lead fuel to two or more inlets (10) arranged over the length of the manifold (2) and tray (3), or the fuel pipe (23) being divided into two or more branches being connected to two or more fuel conduits (5) which lead fuel to two or more inlets (10) arranged over the length of the manifold (2) and tray (3).

5. The manifold arrangement according to any of the

proceeding claims, wherein the manifold element and spreading member are narrow and elongated with a length substantially larger than the breadth..

6. The manifold arrangement according to any of the proceeding claims, the manifold (2) being provided with one or more elongated branches, each branch being provided with an elongated cavity (12), a longitudinal opening (13) and a sealed end section (7,8).

7. The manifold arrangement according to any of the proceeding claims, the manifold (2) having the shape of a curve or branched line, with one or more curvatures.

8. A burner arrangement (16) comprising a manifold arrangement (1) according to any of the proceeding claims, a tube arrangement (21, 23), a pump (22) and a fuel reservoir (17),

the manifold arrangement (1) being connected to the tube arrangement (21, 23) in such a way that fuel can pass from the tube arrangement into the manifold arrangement (1),

the fuel reservoir (17) is connected to the tube arrangement (21, 23) in such a way that fuel can pass from the reservoir (17) into the tube arrangement, the pump (22) being connected to the tube arrangement in such a way that it can provide a forward thrust for fuel flowing in the tube arrangement between the reservoir (17) and the manifold arrangement.

9. A burner arrangement according to claim 8, wherein the pump is a diaphragm pump.

10. A burner arrangement according to claim 8 or 9, wherein the igniter (6) and flow rate of the fuel being provided to the manifold arrangement by means of the pump, are remotely controlled.

11. A burner arrangement according to any of the claims 8 to 10, the fuel reservoir being located in a shelf or slidable drawer (17).

12. A burner arrangement according to any of the claims 8-11, the reservoir (17) being arranged below the manifold arrangement (1).

13. A fireplace comprising a burner arrangement (16) according to any of the claims 8-11, a frame (25, 26, 27, 28, 29) and a protective transparent shield.

14. A fireplace according to claim 13, the burner arrangement (16) being arranged mainly in or on a slidable drawer, the fireplace further comprising a removable cover covering the burner arrangement.

15. A fireplace according to claim 13 or 14, with at

least a part of the frame being transparent.

16. A fireplace according to any of the claims 12 to 15, further comprising a wall mounting arrangement.

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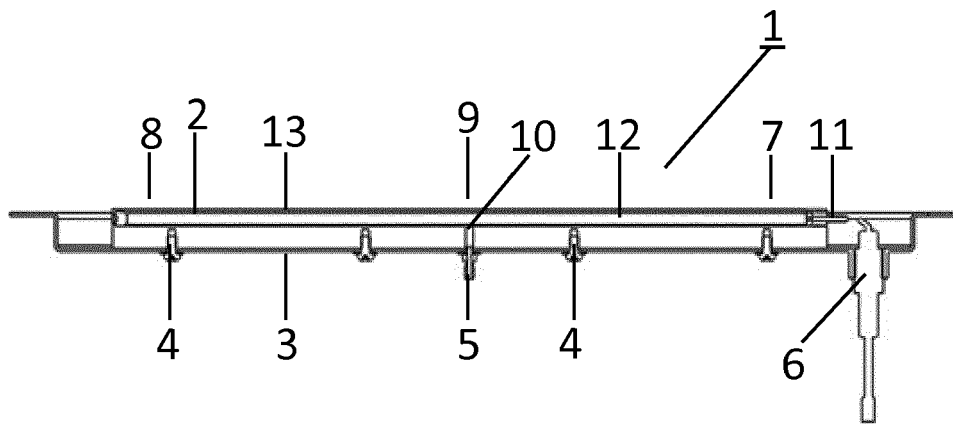


Fig. 1

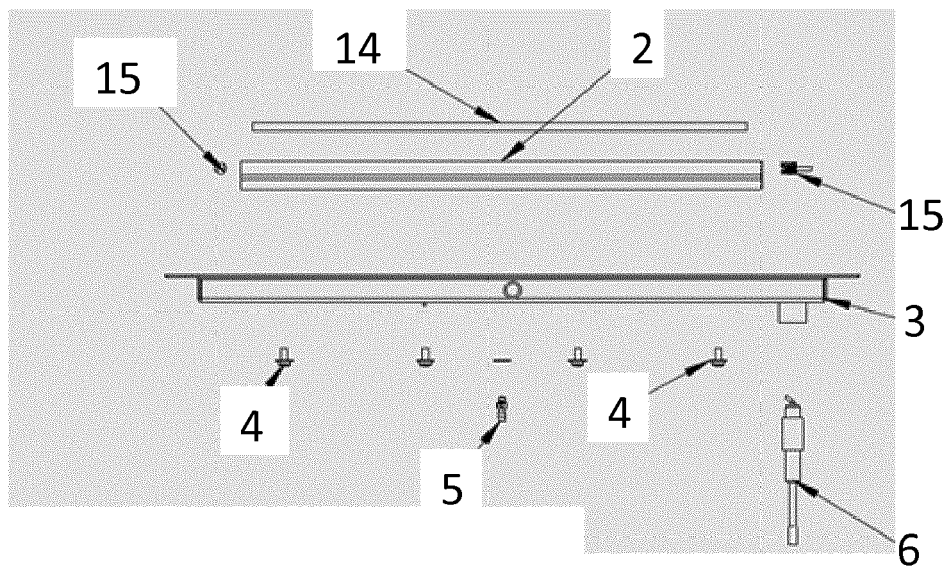


Fig. 2

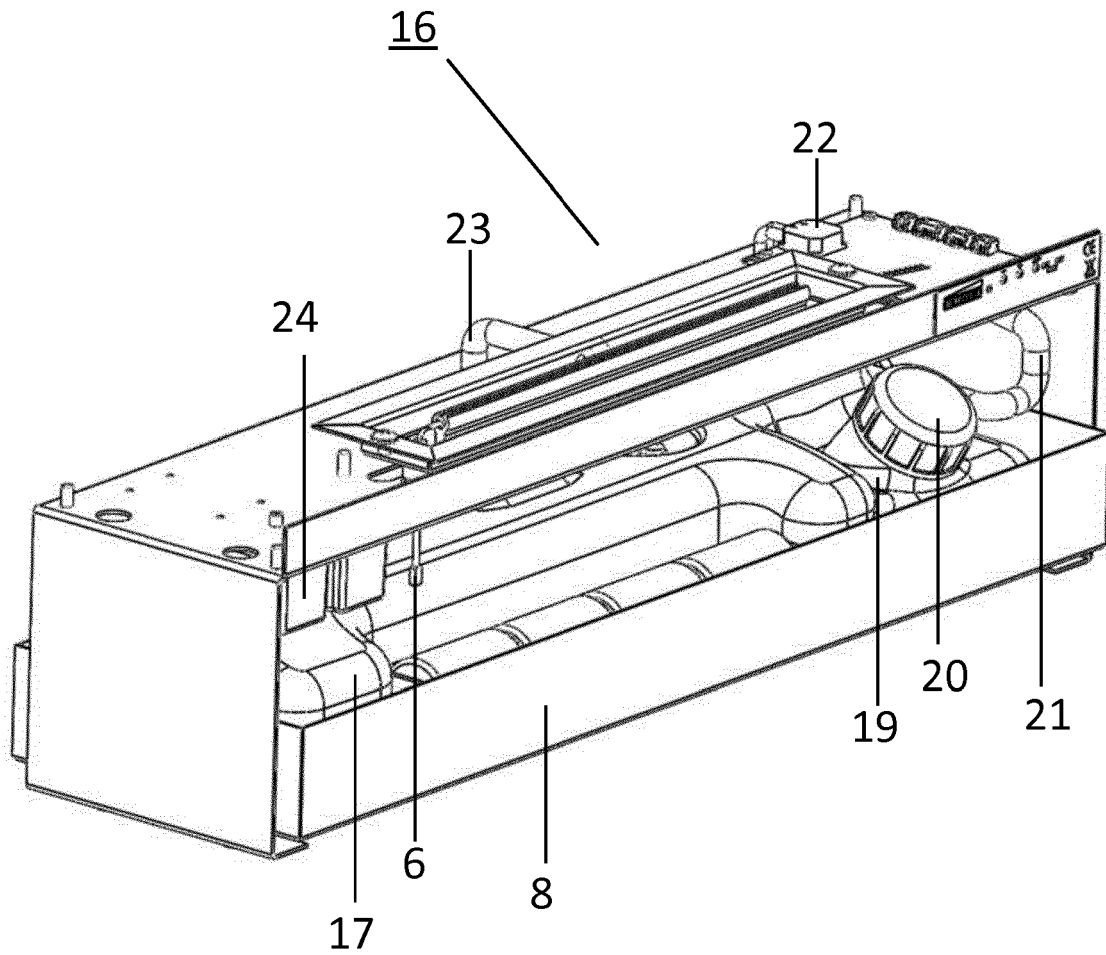


Fig. 3

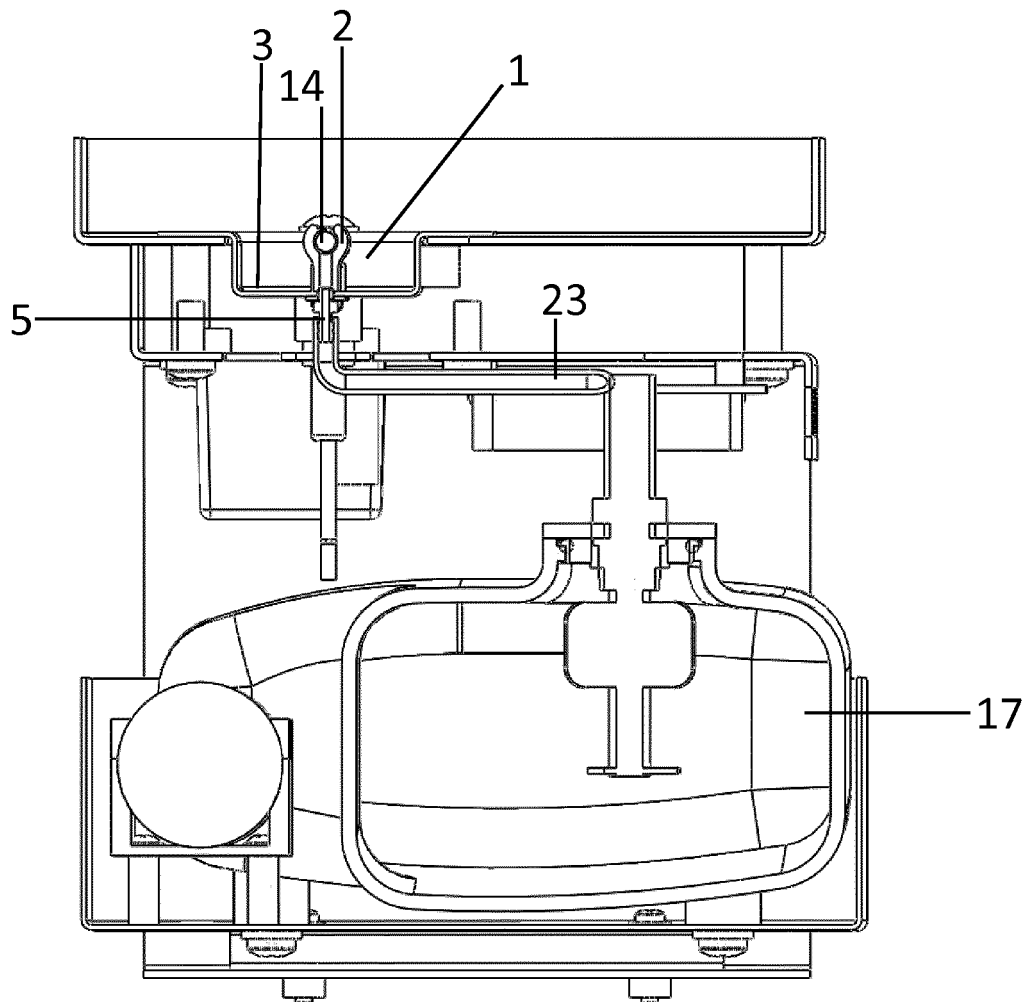


Fig. 4

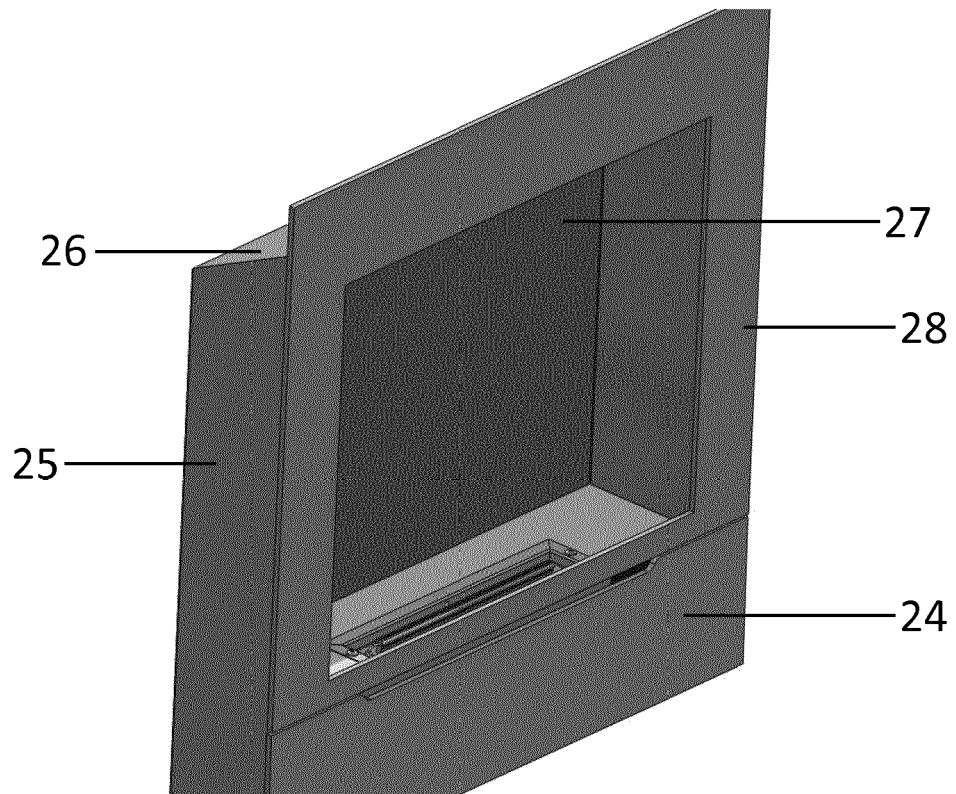


Fig.5

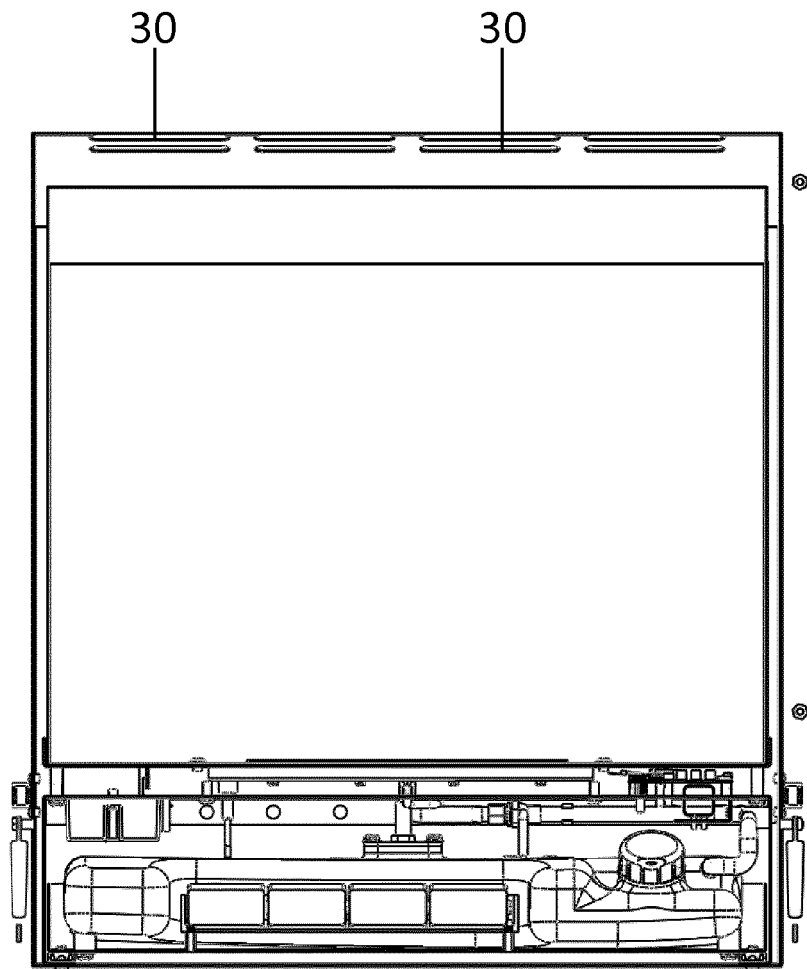


Fig. 6



EUROPEAN SEARCH REPORT

Application Number
EP 12 19 3822

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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 15 April 2013	Examiner Haegeman, Marc
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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