



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
17.05.2023 Bulletin 2023/20

(51) International Patent Classification (IPC):
F24C 3/08 (2006.01)

(21) Application number: **21208459.4**

(52) Cooperative Patent Classification (CPC):
F24C 3/085; F24C 3/08

(22) Date of filing: **16.11.2021**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

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(54) **GAS BURNER ARRANGEMENT, WORK SURFACE ARRANGEMENT AND METHOD FOR OPERATING A GAS BURNER ARRANGEMENT**

(57) A gas burner arrangement (1), comprising:
an accommodation element (2) configured to be vertically (V) retractable into a work surface (101) and including at least one storage portion (3);
at least one gas burner (4) configured to be removably

stored in the storage portion (3); and
at least one tube (5) extending at least partly through the accommodation element (2) and for conducting gas to the at least one gas burner (4).

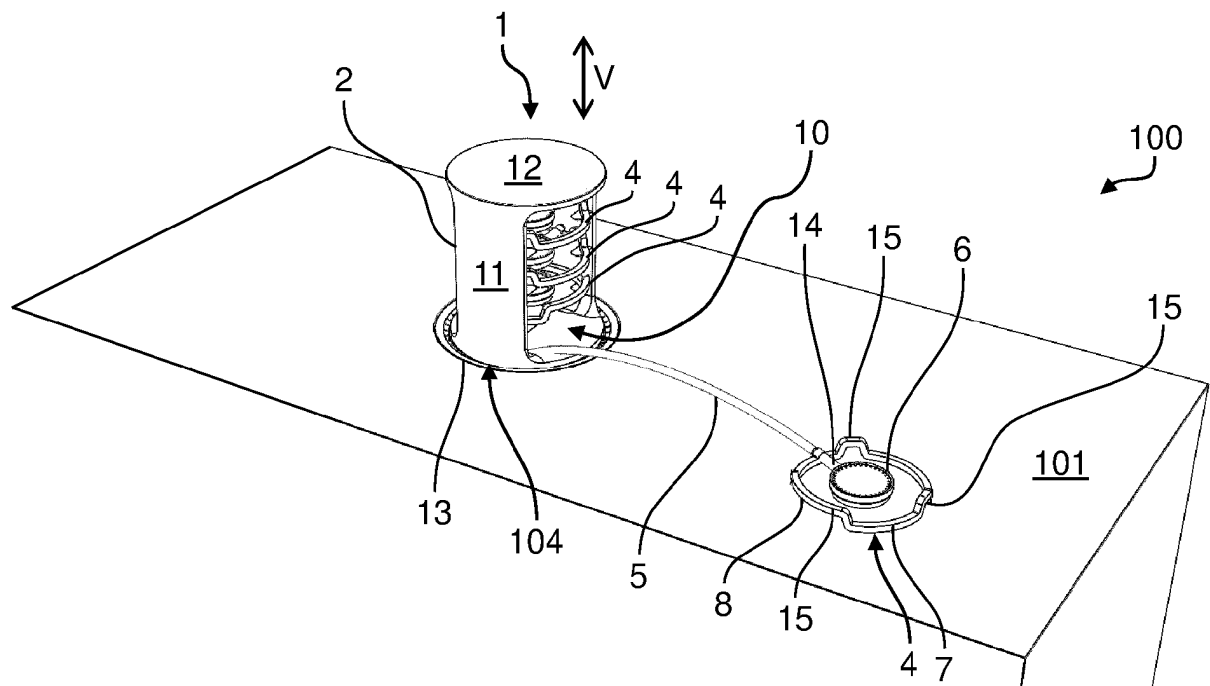


Fig. 2

Description

[0001] The present invention relates to a gas burner arrangement, a work surface arrangement and a method for operating a gas burner arrangement.

[0002] Flexible cooking solutions are known for induction hobs, in which different zones of an induction cooking surface can be selected to adapt to a size of a cooking pot and/or to a required power. It can be desired to provide a flexible solution for gas hobs, in which gas burners can be placed where a user needs them.

[0003] The application WO 2020/193301 A1 discloses a gas hob having a connection rail arranged on a top sheet of the gas hob. Gas burners are releasably connected to the connection rail.

[0004] It is one object of the present invention to provide an improved gas burner arrangement.

[0005] According to a first aspect, a gas burner arrangement is provided. The gas burner arrangement comprises:

an accommodation element configured to be vertically retractable into a work surface and including at least one storage portion;

at least one gas burner configured to be removably stored in the storage portion; and

at least one tube extending at least partly through the accommodation element for conducting gas to the at least one gas burner.

[0006] The gas burner may be placed on the work surface wherever a user needs it. The gas burner may be stored away in the storage portion, in particular when not needed for cooking. The stored away gas burner can be retracted into the work surface. This can reduce the space that is required for the gas burner arrangement. In particular, no fixed gas burner is provided, and lost space for such fixed gas burners is reduced.

[0007] The gas burner arrangement may be for a gas hob. The gas burner arrangement may be arranged in the work surface, preferably in a kitchen, a camping car, a boat or the like.

[0008] The work surface may be made of a heat-resistant material such as stone, Corian, concrete or the like. Preferably, the work surface is not part of the gas burner arrangement, but the gas burner arrangement may be arranged in and/or on the work surface.

[0009] The accommodation element being vertically retractable into the work surface in particular means that the accommodation element is lowerable into the work surface such as to disappear into the work surface at least partly. Preferably, the accommodation element is entirely vertically retractable into the work surface. A user may pull out the accommodation element from the work surface to access the storage portion. The work surface may extend in a horizontal plane. The accommodation element may be retractable into the work surface at a 90° angle with respect to the extension plane of the work

surface. The accommodation element may include a push-pull mechanism allowing the retractability thereof.

[0010] The work surface may include an opening therein to hold the accommodation element in the retracted state. In particular, the opening is formed in a center of the work surface or such that, when the accommodation element is retracted, it is surrounded by the work surface on all its lateral sides.

[0011] The storage portion can be a receptacle for the gas burner. It may be formed on an interior of the accommodation element. The storage portion may include a support, such as shelves or brackets, for holding the gas burner.

[0012] The at least one gas burner can also be referred to as "the gas burner" in the following. The gas burner can include one or more burner rings which include openings through which flames resulting from the gas combustion come out for cooking purposes.

[0013] The gas burner being removably stored in the storage portion in particular means that the gas burner can selectively be stored in the storage portion or not stored in the storage portion. "Stored in the storage portion" in particular means that the gas burner is accommodated or positioned in or on the storage portion, preferably held by the storage portion. The gas burner may be in a stored state in which it is stored in the storage portion and in a use state in which it is not stored in the storage portion. For example, the gas burner is in the stored state when it is not used by the user. The gas burner may be in the use state when it is used for cooking. In the use state, the gas burner may be placed on the work surface.

[0014] In particular, the gas burner is configured to be both stored in the storage portion and removed from the storage portion during a normal usage of the gas burner and not only for maintenance, replacement and/or cleaning purposes. Preferably, the gas burner can be slid into the storage portion without having to loosen or open any screws, latches or the like.

[0015] The expression "at least one tube" is also referred to as just "tube" in the following. The tube can be a hose or any type of tube-shaped connection between the gas burner and the accommodation element. The tube is made for conducting gas to the gas burner for combustion. As used herein, the gas comprises a fuel gas. In particular, the gas can be a mixture of a fuel gas, such as acetylene, natural gas or propane, with an oxidizer, such as ambient air, supplied oxygen or the like. Such a gas mixture can be referred to as a combustible gas mixture. Preferably, the gas is not solely made of ambient air.

[0016] The tube is in particular attached to the gas burner on one side. The tube can be attached to the accommodation element on the other side. The tube may be connected to a main gas line (main pipe) in or below the accommodation element such that the main gas line can provide the tube with the gas. The main pipe can be a pipe of a main gas network or a pipe that is connected

to a gas bottle. The tube may be connected to the gas bottle directly. The tube extending at least partly through the accommodation element means that at least a portion of the tube extends through the accommodation element, in particular through the storage portion. A portion of the tube may extend vertically through the accommodation element. The portion of the tube can extend through the accommodation element to reach the main pipe. Optionally, the pipe is attached to the accommodation element. **[0017]** The tube may connect the gas burner to the accommodation element

[0018] According to an embodiment, the at least one tube is bendable such as to be stored in the storage portion together with the at least one gas burner.

[0019] "Bendable" in particular means that the tube is flexible. This is advantageous in that the bendable tube allows the user to place the gas burner wherever he wants. The tube can be rolled in or bent such as to be stored away in the storage portion together with the gas burner, allowing to reduce the space required to store away the gas burner arrangement and increasing available space for cooking. In particular, the tube is stored away while still being connected to the gas burner and optionally to the accommodation element.

[0020] According to a further embodiment, the gas burner arrangement further comprises:

multiple gas burners configured to be removably stored in the storage portion; and
multiple tubes each extending at least partly through the accommodation element and conducting gas to the corresponding gas burner.

[0021] The description provided with the at least one gas burner and at least one tube equally holds for the multiple gas burners and multiple tubes, respectively. In particular, the multiple gas burners can be stored all together in the storage portion. The tubes may all be stored in the storage portion together with the gas burners. Each gas burner has a corresponding tube for providing the corresponding gas burner with gas. The multiple tubes can all be connected to the main pipe.

[0022] According to a further embodiment, the gas burner arrangement comprises between four and six gas burners and tubes.

[0023] According to a further embodiment, the storage portion is formed on an interior of the accommodation element and the at least one gas burner is configured to be removably stored inside the storage portion.

[0024] In particular, the accommodation element has a hollow portion on an interior thereon which forms the storage portion. The storage portion may be a receptacle formed in the accommodation element.

[0025] According to a further embodiment, the accommodation element has a cylindrical shape.

[0026] In particular, the symmetry axis of the cylindrical accommodation element extends vertically.

[0027] According to a further embodiment, the cylin-

drical accommodation element has a lateral opening for inserting and removing the at least one gas burner into and out of the storage portion.

[0028] The gas burner can be inserted to and removed from the storage portion through the lateral opening provided on at least one lateral side of the accommodation element. The accommodation element may include multiple lateral openings and/or a lateral opening extending along more than a quarter, preferably along more than a half of the circumference of the cylindrical accommodation element. This allows the user to remove and insert the gas burner from multiple or any side of the accommodation element, which renders the use and storage of the gas burners more convenient and flexible.

[0029] According to a further embodiment, the accommodation element has a cylindrical shape which is hollow in an interior thereof, wherein the storage portion is formed by the hollow part of the cylindrical accommodation element.

[0030] When the gas burner has a circular shape, the cylindrical storage portion allows an optimal storage capacity of the gas burner.

[0031] According to a further embodiment, the gas burner arrangement further includes a connection portion for connecting the at least one tube to a main pipe providing the gas burner arrangement with gas.

[0032] The connection portion can be a connector, a valve or the like. The connection portion may be located below the accommodation element. The connection portion can allow a leakproof connection of the tube to the main pipe.

[0033] According to a further embodiment, the at least one gas burner includes a handle, wherein the handle in particular has an insulating sleeve, in particular a silicon sleeve.

[0034] The gas burner may include a pot support for supporting a pot while cooking. The handle can be part of the pot support.

[0035] According to a further embodiment, the accommodation element further includes a user interface for selecting a power to the at least one gas burner.

[0036] The user interface can be a knob, touch display, or any other unit allowing the user to physically change the power to the gas burner. The user interface may also be a wireless control unit which the user can wirelessly control to select the desired power to the gas burner, for example via a phone. The power to the gas burner can correspond to the amount of gas supplied to the gas burner by the tube. The user interface may allow to select a power to each individual gas burner.

[0037] According to a further embodiment, the accommodation element further includes a valve unit for adjusting a gas flow to the at least one gas burner as a function of the power selected through the user interface.

[0038] The valve unit may be controlled in accordance with the power selected through the user interface. The valve unit may include a control valve per gas burner. The control valve may control the size of the gas flow to

the corresponding gas burner, allowing to vary between a closed gas flow (no gas flow) and a maximum gas flow.

[0039] According to a further embodiment, the gas burner arrangement further includes an exhaust element located below the accommodation element for absorbing cooking fumes; wherein the accommodation element is configured to guide the cooking fumes towards the exhaust element.

[0040] The exhaust element may include a filter, a vacuum unit, a suction unit or the like which allows absorbing and filtering cooking fumes. The accommodation element may act as a channel to lead the cooking fumes to the exhaust element. To lead the cooking fumes to the exhaust element, the accommodation element is in its pulled-out state (not retracted into the work surface) or at least partly pulled out of the work surface.

[0041] According to a second aspect, a work surface arrangement is provided. The work surface arrangement includes:

the gas burner arrangement according to the first aspect or according to an embodiment thereof; and a work surface, the work surface having an opening into which the gas burner arrangement is retractably arranged.

[0042] According to an embodiment, an upper surface of the accommodation element is flush with the work surface when the accommodation element is retracted into the work surface.

[0043] This means that the accommodation element and the work surface can form a flat surface when the accommodation element is retracted into the work surface.

[0044] The embodiments and features described with reference to the gas burner arrangement of the first aspect or according to an embodiment thereof apply mutatis mutandis to the work surface arrangement of the second aspect.

[0045] According to a third aspect, a method for operating the gas burner arrangement according to the first aspect or according to an embodiment thereof is provided. The method includes:

placing the at least one gas burner in the storage portion to store away the at least one gas burner; and taking the at least one gas burner out of the storage portion and providing the at least one gas burner with fuel gas through the tube.

[0046] The embodiments and features described with reference to the gas burner arrangement of the first aspect or according to an embodiment thereof apply mutatis mutandis to the method of the third aspect.

[0047] According to a fourth aspect, a gas hob with the gas burner arrangement of the first aspect or according to an embodiment thereof is provided.

[0048] Further possible implementations or alternative

solutions of the invention also encompass combinations - that are not explicitly mentioned herein - of features described above or below with regard to the embodiments. The person skilled in the art may also add individual or isolated aspects and features to the most basic form of the invention.

[0049] Further embodiments, features and advantages of the present invention will become apparent from the subsequent description and dependent claims, taken in conjunction with the accompanying drawings, in which:

Fig. 1 shows a gas burner arrangement;

Fig. 2 shows a work surface arrangement with a pulled-out accommodation element and one gas burner being used;

Fig. 3 shows the work surface arrangement of Fig. 2 with a pulled-out accommodation element and four gas burners being used;

Fig. 4 shows the work surface arrangement of Fig. 2 with a pulled-out accommodation element and four gas burners being stored away;

Fig. 5 shows the work surface arrangement of Fig. 2 with a partially retracted accommodation element and four gas burners being stored away;

Fig. 6 shows the work surface arrangement of Fig. 2 with an entirely retracted accommodation element and four gas burners being stored away;

Fig. 7 shows a portion of the work surface arrangement of Fig. 6;

Fig. 8 shows the work surface arrangement of Fig. 2 with a partially retracted accommodation element and one gas burners being used;

Fig. 9 shows the work surface arrangement of Fig. 2 with a partially retracted accommodation element and four gas burners being used;

Fig. 10 shows a portion of the work surface arrangement of Fig. 9; and

Fig. 11 shows a method for operating the gas burner arrangement.

[0050] In the Figures, like reference numerals designate like or functionally equivalent elements, unless otherwise indicated.

[0051] Fig. 1 shows a gas burner arrangement 1. The gas burner arrangement 1 comprises an accommodation element 2 with a storage portion 3, four gas burners 4 and corresponding tubes 5 connecting each gas burner 4 to the accommodation element 2 for providing gas to

the gas burners 4. The gas burner arrangement 1 of Fig. 1 will be described in conjunction with Fig. 2, which shows a work surface arrangement 100, in the following.

[0052] The work surface arrangement 100 of Fig. 2 includes a work surface 101 and the gas burner arrangement 1 of Fig. 1 popping out of the work surface 101. The work surface 101 is a kitchen counter made of a heat-resistant material such as stone, Corian, concrete or the like. In the center of the work surface 101, a work surface opening 104 is provided. Inside the work surface opening 104, a cylindrical receptacle 13 is formed, of which only an upper edge is visible in Fig. 2. The cylindrical receptacle 13 is an optional part of the gas burner arrangement 1.

[0053] The accommodation element 2 has a cylindrical shape having an upper surface 12 and a lateral surface 11. An inside of the accommodation element 2 is hollow and forms a cylindrical storage portion 3. The storage portion 3 allows storing the gas burners 4 including their respective tubes 5. Within the storage portion 3, the gas burners 4 are arranged one above another and held by holders 9 protruding radially inwards in a horizontal plane and forming a shelf system (see Fig. 3).

[0054] The lateral surface 11 of the accommodation element 2 includes two lateral openings 10 for accessing the gas burners 4. In Fig. 2, only one of the lateral openings 10 is visible. The other lateral opening 10 is located symmetrically on the other side of the accommodation element 2. The gas burners 4 can be taken in and out of the storage portion 3 through the openings 10. Thereby, the user can decide how many gas burners 4 he needs and only take the required number of gas burners 4 out of the storage portion 3. In the example of Fig. 2, one gas burner 4 was taken out of the storage portion 3 and placed on the work surface 101. The remaining three gas burners 4 are stored in the storage portion 3.

[0055] The gas burners 4 all have identical sizes and shapes. In detail, each gas burner 4 includes a burner ring 6 including openings arranged in a circle through which flames exit the gas burner 4. The tube 5 is connected to the burner ring 6 to provide the burner ring 6 with gas. Upon ignition of the gas, flames are generated.

[0056] Surrounding the burner ring 6, the gas burner 4 includes a pot holder 7. The pot holder 7 has a ring shape with elevations 15 in three locations around the circumference of the pot holder 7. When a pot is placed on the pot holder 7 for cooking, the pot stands on the elevations 15 above the flames. At least one of the elevation 15 is covered by an insulating sleeve such as a silicon sleeve such as to form a handle 8 for handling the gas burner 4.

[0057] Fig. 3 shows the same work surface arrangement 100 as Fig. 2, wherein all gas burners 4 are taken out of the storage portion 3 and placed on the work surface 101. As shown in Fig. 2 and 3, the gas burners 4 can be placed anywhere on the work surface 101 on all sides around the accommodation element 2. A distance between the accommodation element 2 and the gas

burners 4 is smaller or equal to a length of the tubes 5. The tubes extend through the storage portion 3 of the accommodation element 2 without being fixedly attached thereto. The tubes 5 connect the gas burners 4 to a main pipe (not shown) located below the accommodation element 2 and below the work surface 101. The main pipe provides the respective tubes 5 with combustible gas. The tubes 5 conduct the combustible gas to the gas burners 4, where flames are provided for cooking.

[0058] In the example of Fig. 3, the work surface arrangement 100 includes a control knob 103 for the user to select a power to each gas burner 4. The control knob 103 is coupled to a valve unit (not shown) of the gas burner arrangement 1 which adjusts a gas flow to the respective gas burners in accordance with the setting of the control knob 103.

[0059] Fig. 4 shows the same work surface arrangement 100 as Fig. 2 and 3, wherein all gas burners 4 and their tubes 5 are stored away in the storage portion 3. The entire gas burner arrangement 1 can thereby be packed in a small cylindrical space defined by the accommodation element 2.

[0060] The work surface opening 104 and the cylindrical receptacle 13 have diameters corresponding to a diameter of the accommodation element 2. The accommodation element 2 can be vertically retracted into the work surface 101 in the vertical direction V. Fig. 5 shows the accommodation element 2 which is partly retracted in the work surface 101 with all gas burners 4 and tubes 5 stored in the storage portion 3. Fig. 6 shows the accommodation element 2 which is entirely retracted in the work surface 101 with all gas burners 4 and tubes 5 stored in the storage portion 3.

[0061] In detail, when the gas burner arrangement 1 is in its pulled-out state (Fig. 2 or 4), a user can push the accommodation element 2 vertically downwards. This makes the accommodation element 2 slide into the work surface opening 104 and the cylindrical receptacle 13 (Fig. 3 and 4). The flexible tubes 5 are pulled inside the work surface 101 through the work surface opening 104. The accommodation element 2 and/or the receptacle 13 may include a push-pull system, spring system and/or a blocking system allowing to maintain the accommodation element 2 at the partly or entirely retracted position in accordance with how far it was pushed down by the user.

[0062] Once the accommodation element 2 is entirely retracted into the work surface 101 (Fig. 6), the upper surface 12 of the accommodation element 2 is flush with the work surface 101 (see Fig. 7). In other words, the gas burner arrangement 1 entirely disappears inside the work surface 101, thereby increasing a surface available for cutting food of the like.

[0063] When the user wants to use the gas burners 4, he can push the upper surface 12 of the retracted accommodation element 2 vertically downward. The push-pull system within the accommodation element 2 and/or the receptacle 3 pushes the accommodation element 2 vertically out of the work surface 101 (upward), to reach

the intermediate pulled-out and entirely pulled-out stated of Fig. 4 and 5.

[0064] As shown in Fig. 8 and 9, it is also possible to partly retract the accommodation element 2 while one or multiple gas burners 4 are placed on the work surface 101. In detail, the accommodation element 2 is retracted so far into the work surface 101 that it only leaves sufficient space for the tubes 5 to come out of the openings 10 and conduct gas to the gas burners 4. This allows storing away the accommodation element 2 even during cooking.

[0065] Fig. 10 shows the portion of Fig. 9 in the dashed box. As shown in Fig. 10, in the partly retracted state, the gas burner arrangement 1 can be used to absorb cooking fumes 102. Namely, the gas burner arrangement 1 comprises, below the accommodation element 2, an exhaust element (not shown) for absorbing cooking fumes 102. As shown by the arrows in Fig. 10, the cooking fumes 102 enter the accommodation element 2 through the parts of the openings 10 that are above the work surface 101. This allows a 360° air intake. The cooking fumes 102 are then guided through the interior of the accommodation element 2 (through the storage portion 3) towards the exhaust element. The exhaust element includes a filter for filtering the cooking fumes 102 and removing odors from the cooking fumes 102, for example.

[0066] Fig. 11 shows a method for operating the gas burner arrangement 1. In a step S1, at least one gas burner 4 is manually placed in the storage portion 3 to store away the at least one gas burner 4. In a step S2, the at least one gas burner 4 is taken out of the storage portion 3 and provided with fuel gas through the tube 5.

[0067] Although the present invention has been described in accordance with preferred embodiments, it is obvious for the person skilled in the art that modifications are possible in all embodiments. For example, instead of a gas burner arrangement 1 comprising four gas burners 4, the gas burner arrangement 1 may include one, two, three, five or more gas burners 4. Different gas burners 4 of a same gas burner arrangement 1 can have different shapes and/or sizes. Instead of a cylindrical accommodation element 2, the accommodation element can have the shape of a rectangular cuboid, for example.

Reference Numerals:

[0068]

- 1 gas burner arrangement
- 2 accommodation element
- 3 storage portion
- 4 gas burner
- 5 tube
- 6 burner ring
- 7 pot holder
- 8 handle
- 9 holder
- 10 opening

- 11 lateral surface
- 12 upper surface
- 13 receptacle
- 14 bridge portion
- 5 15 elevation
- 100 work surface arrangement
- 101 work surface
- 102 cooking fumes
- 103 control knob
- 10 104 work surface opening
- V vertical

Claims

1. A gas burner arrangement (1), comprising:
 - an accommodation element (2) configured to be vertically (V) retractable into a work surface (101) and including at least one storage portion (3);
 - at least one gas burner (4) configured to be removably stored in the storage portion (3); and
 - at least one tube (5) extending at least partly through the accommodation element (2) for conducting gas to the at least one gas burner (4).
2. The gas burner arrangement according to claim 1, wherein the at least one tube (5) is bendable such as to be stored in the storage portion (3) together with the at least one gas burner (4).
3. The gas burner arrangement according to claim 1 or 2, comprising:
 - multiple gas burners (4) configured to be removably stored in the storage portion (3); and
 - multiple tubes (5) each extending at least partly through the accommodation element (2) and for conducting gas to the corresponding gas burner (4).
4. The gas burner arrangement according to claim 3, comprising between four and six gas burners (4) and tubes (5).
5. The gas burner arrangement according to one of claims 1 to 4, wherein the storage portion (3) is formed on an interior of the accommodation element (2) and wherein the at least one gas burner (4) is configured to be removably stored inside the storage portion (3).
6. The gas burner arrangement according to one of claims 1 to 5, wherein the accommodation element (2) has a cylindrical shape.
7. The gas burner arrangement according to claim 6,

wherein the cylindrical accommodation element (2) has a lateral opening (10) for inserting and removing the at least one gas burner (4) into and out of the storage portion (3).

8. The gas burner arrangement according to claim 6 or 7, wherein the accommodation element (2) has a cylindrical shape which is hollow in an interior thereof, and wherein the storage portion (3) is formed by the hollow part of the cylindrical accommodation element (2). 5 10
9. The gas burner arrangement according to anyone of claims 1 to 8, further including a connection portion for connecting the at least one tube (5) to a main pipe providing the gas burner arrangement (1) with gas. 15
10. The gas burner arrangement according to one of claims 1 to 9, wherein the at least one gas burner (4) includes a handle (8), wherein the handle (8) in particular has an insulating sleeve, in particular a silicon sleeve. 20
11. The gas burner arrangement according to one of claims 1 to 10, wherein 25
 - the accommodation element (2) further includes a user interface for selecting a power to the at least one gas burner (4); and 30
 - the accommodation element (2) further includes a valve unit for adjusting a gas flow to the at least one gas burner (4) as a function of the power selected through the user interface. 35
12. The gas burner arrangement according to one of claims 1 to 11, further including an exhaust element located below the accommodation element (2) for absorbing cooking fumes; wherein the accommodation element (2) is configured to guide the cooking fumes towards the exhaust element. 40
13. A work surface arrangement (100) comprising:
 - the gas burner arrangement (1) according to one of claims 1 to 12; and 45
 - a work surface (101), the work surface (101) having an opening into which the accommodation element (2) of the gas burner arrangement (1) is retractably arranged. 50
14. The work surface arrangement according to claim 13, wherein an upper surface (12) of the accommodation element (2) is flush with the work surface (101) when the accommodation element (2) is retracted into the work surface (101). 55
15. A method for operating the gas burner arrangement

(1) according to one of claims 1 to 12, including:

placing (S1) the at least one gas burner (4) in the storage portion (3) to store away the at least one gas burner (4); and
 taking (S2) the at least one gas burner (4) out of the storage portion (3) and providing the at least one gas burner (4) with fuel gas through the tube (5).

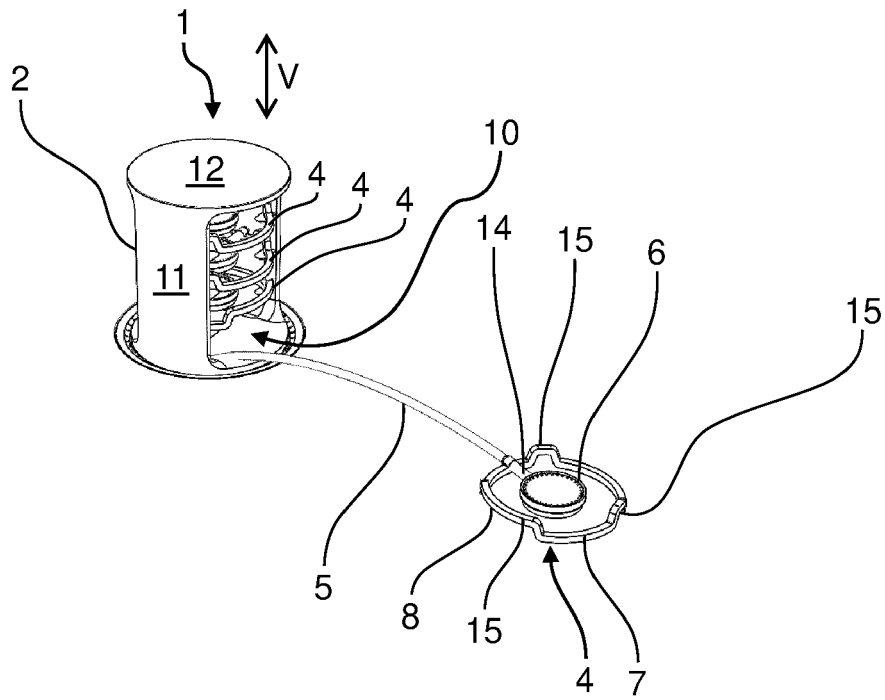


Fig. 1

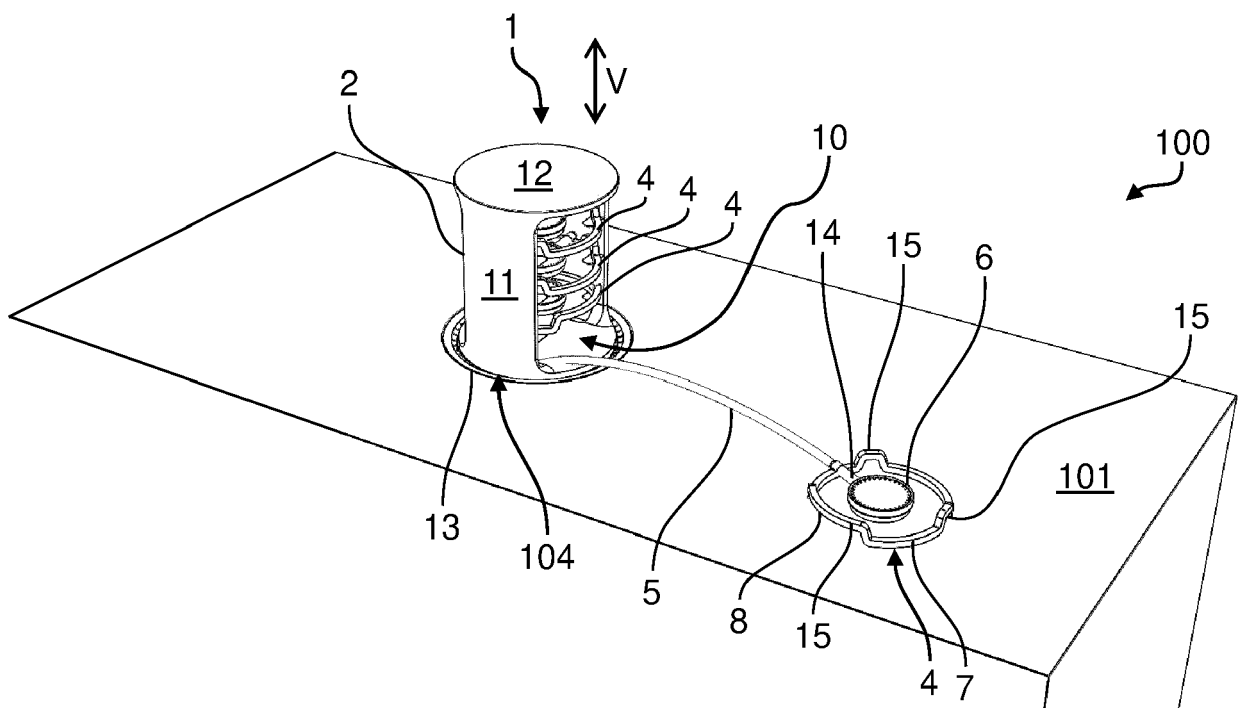


Fig. 2

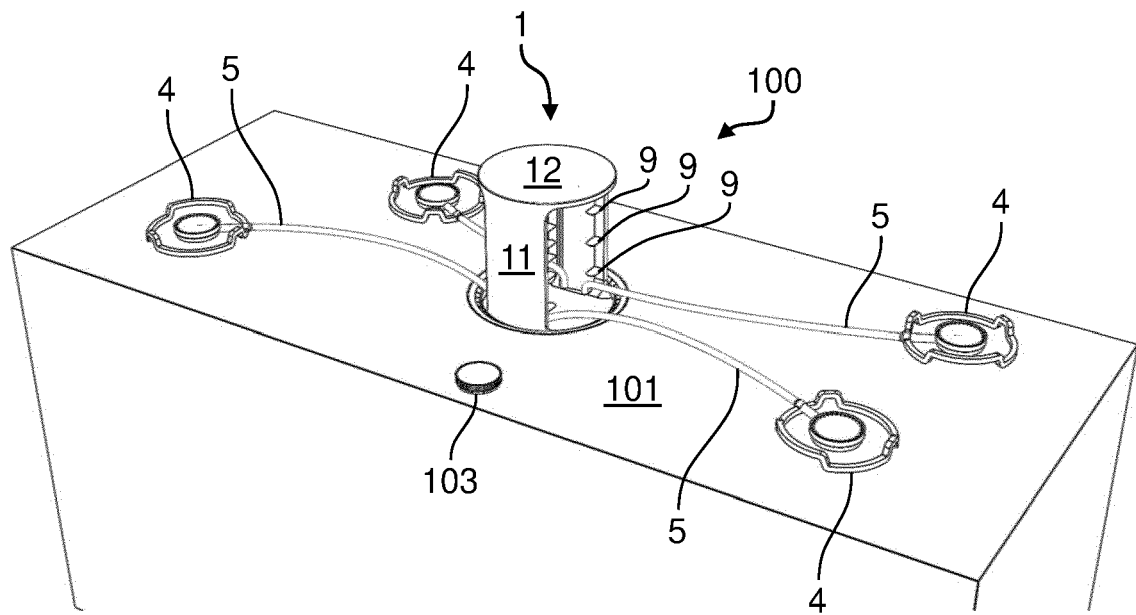


Fig. 3

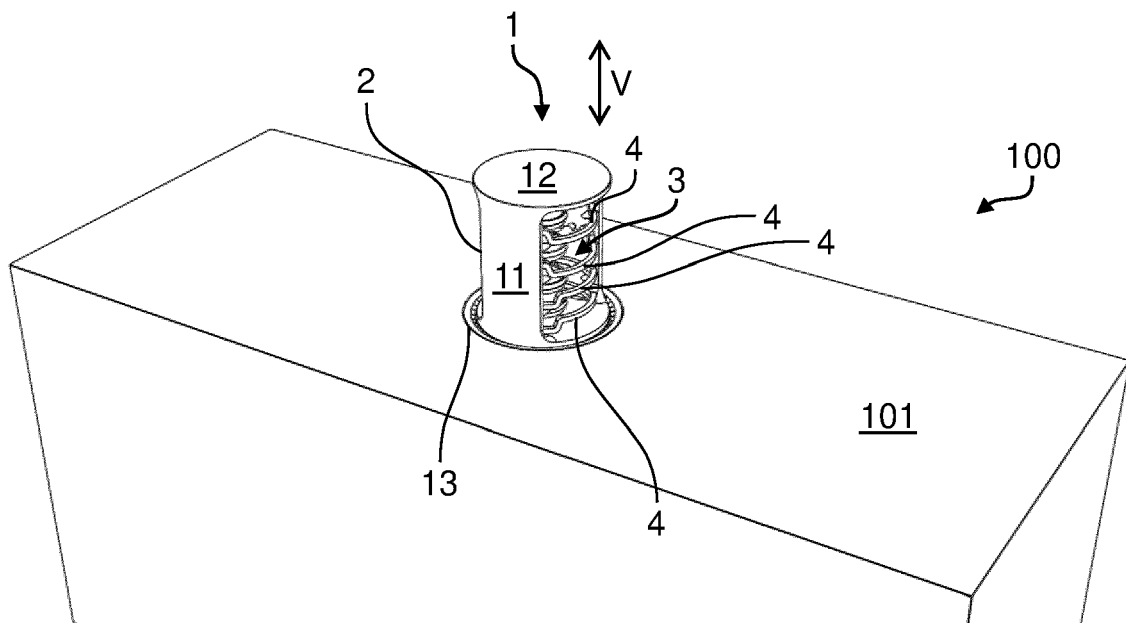


Fig. 4

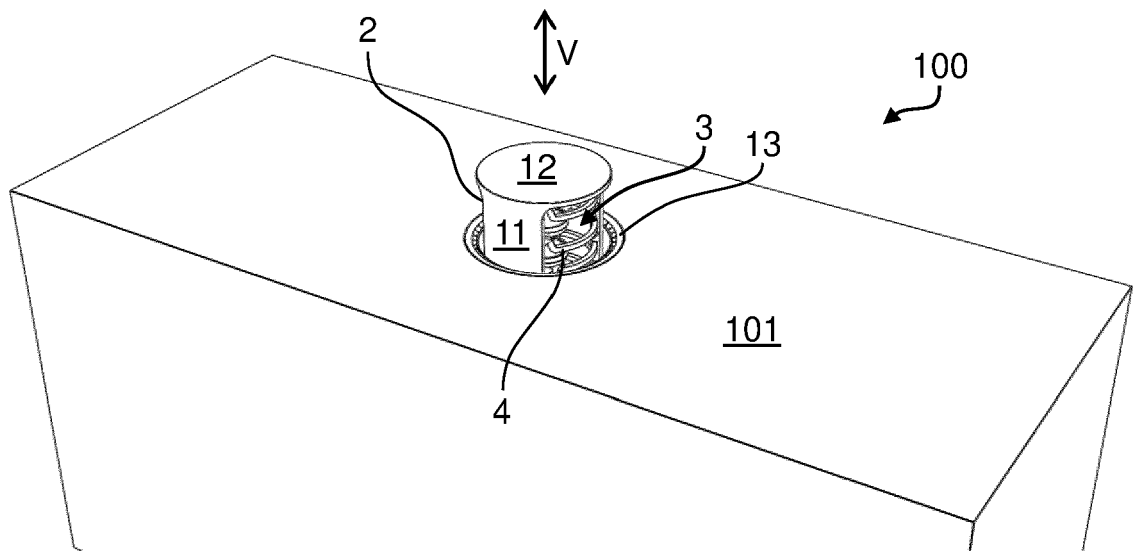


Fig. 5

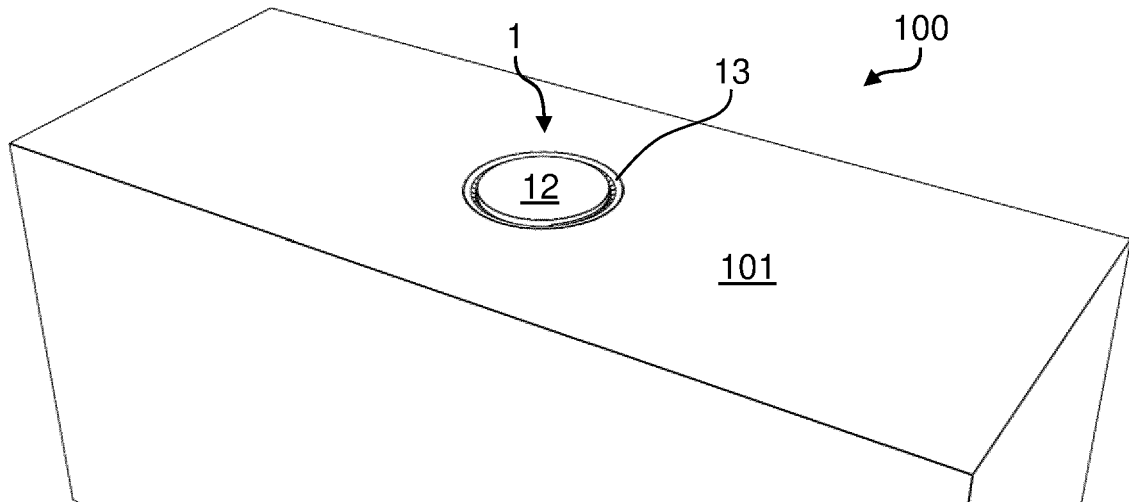


Fig. 6

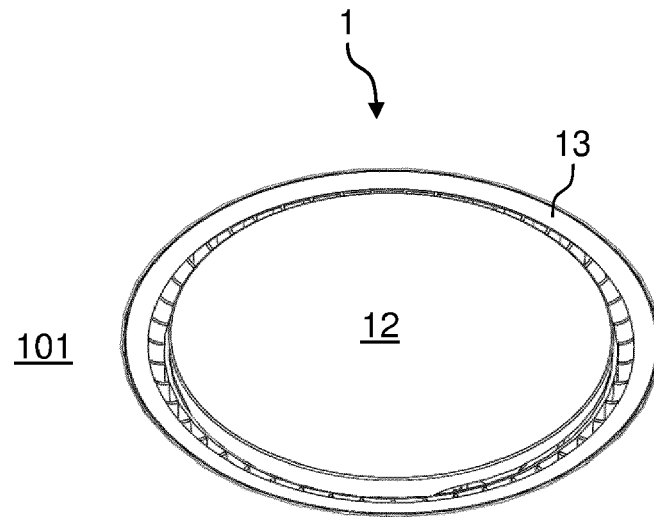


Fig. 7

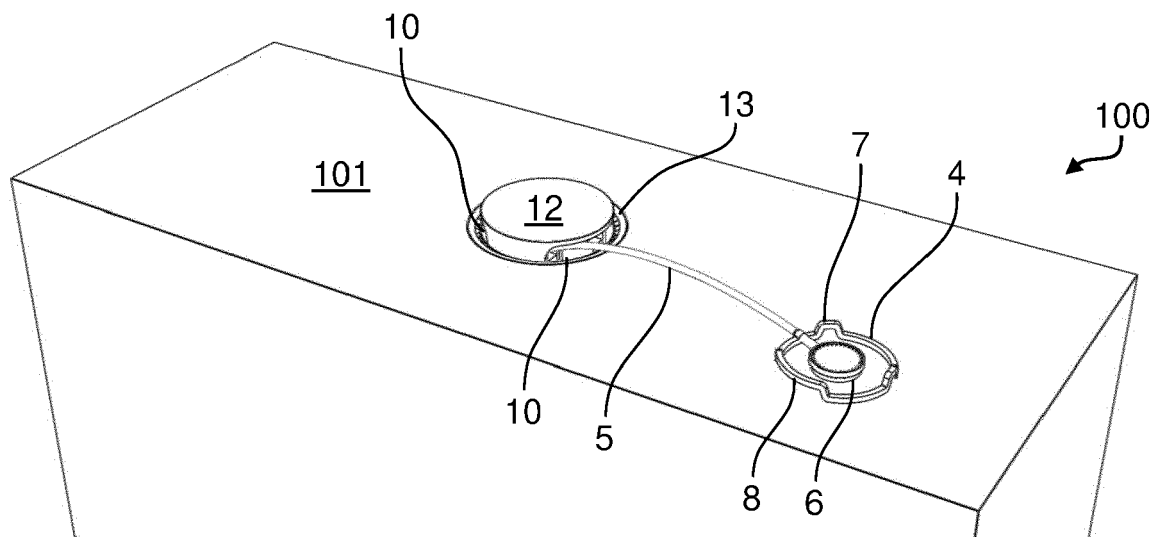


Fig. 8

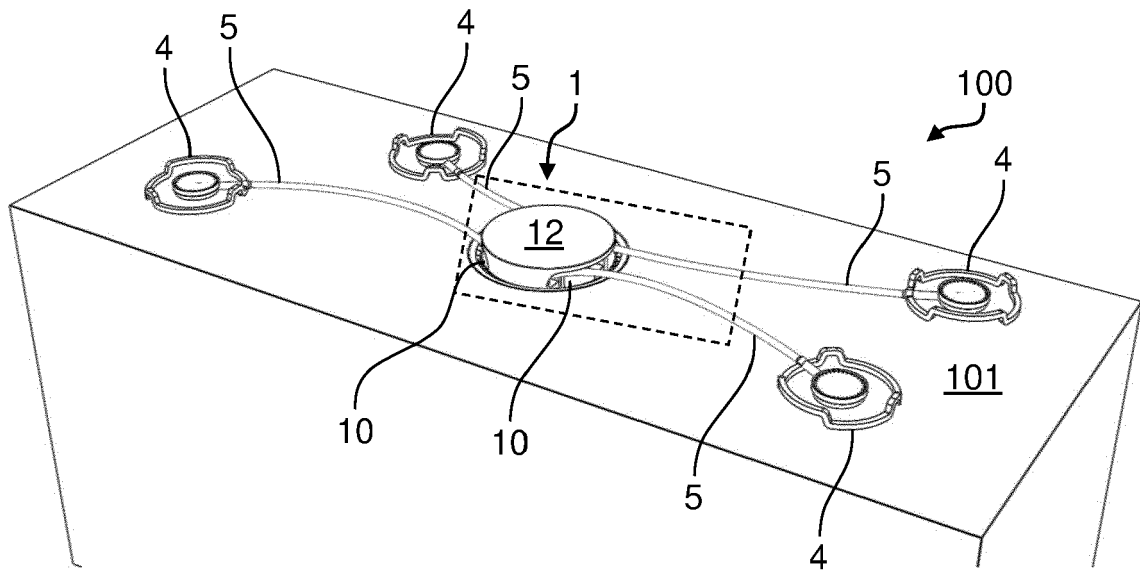


Fig. 9

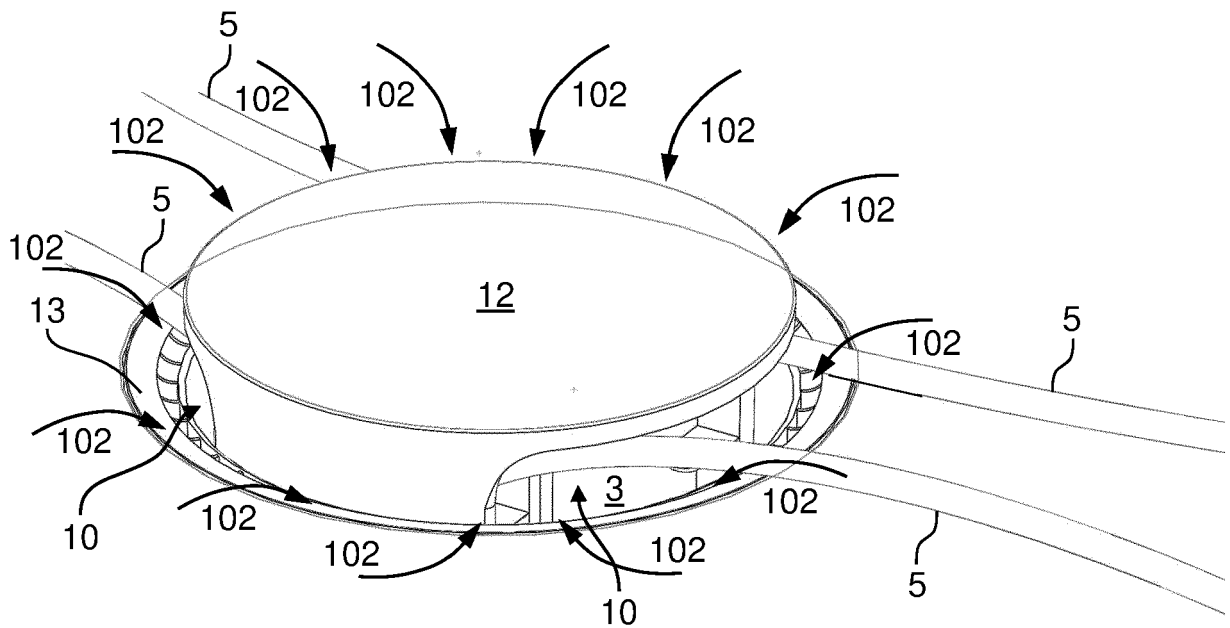


Fig. 10

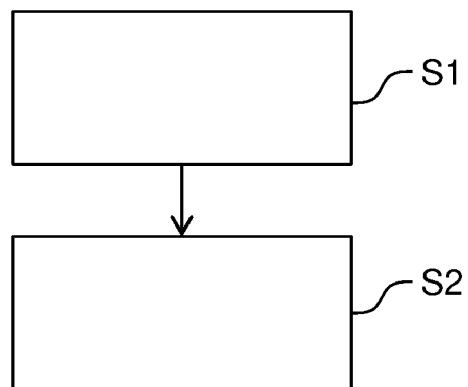


Fig. 11



EUROPEAN SEARCH REPORT

Application Number

EP 21 20 8459

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EPO FORM 1503 03.82 (P04C01)

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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			F24C
The present search report has been drawn up for all claims			
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