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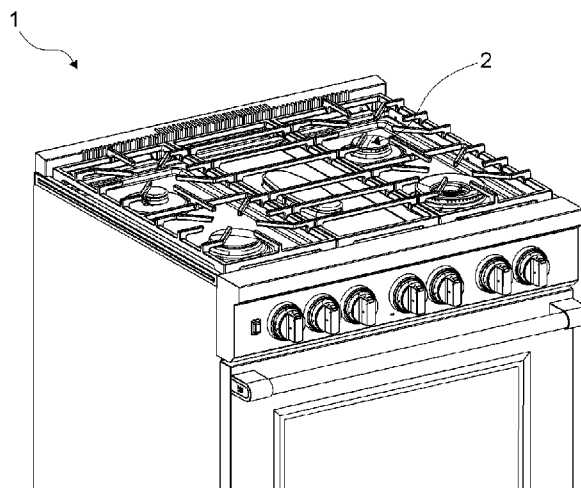
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(54) Title: A COOKING DEVICE COMPRISING AN INJECTOR

Figure 1



(57) Abstract: The present invention relates to a cooking device (1) comprising a burner (2) having a burner body (3) that generates flame by the flammable gases being burned, that enables the cooking container placed thereon to be heated and that has a mixing chamber (4) wherein the gas and the environment air is mixed; a burner head (5) that is disposed on the burner body (3) and that enables the flame to be delivered to the base of the cooking container from the holes that are disposed around the burner head (5); a housing (6) that is arranged at the base of the burner body (3); an injector (7) that is disposed into the housing (6) and that enables the gas to be delivered from the lower side of the burner body (3) into the mixing chamber (4), and a gas inlet line (8) that delivers gas to the injector (7).

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Description**A COOKING DEVICE COMPRISING AN INJECTOR**

[0001] The present invention relates to a cooking device comprising an injector.

[0002] In gas cooking devices such as cooker, oven, etc., the gas received from the network is delivered to the burner by means of a gas line. In order to provide the safety of the device, a leakproofness test must be carried out on the device. In the state of the art, the leakproofness test is realized by connecting the leakproofness control device to the gas inlet of the cooking device. However, in case the leakproofness control device is connected to the cooking device via the gas regulator, the leakproofness control device cannot realize the necessary control due to regulator-induced pressure fluctuations. Consequently, the time elapsed during the leakproofness test extends. Furthermore, since the gas inlet is positioned at the lower side of the cooking device and can be accessed from the rear side of the body, it becomes difficult to connect the leakproofness control device to the gas inlet. In compliance with the standards, in addition to the leakproofness test, the cooking devices must also have a pressure measurement point where the regulator can be controlled after the production and/or the assembly process.

[0003] In the state of the art United States Patent Application No. US5133334 a burner is disclosed having a Venturi channel and an injector.

[0004] The aim of the present invention is the realization of a cooking device of which the safety control is facilitated.

[0005] The cooking device realized in order to attain the aim of the present invention, explicated in the first claim and the respective claims thereof, comprises a burner that have

[0006] - a burner body that has a mixing chamber wherein the gas and the ambient air are mixed,

[0007] - a burner head that is disposed on the burner body and that enables the flame to be delivered to the base of the cooking container from the holes that are disposed around the burner head,

[0008] - a housing that is arranged at the base of the burner body,

[0009] - an injector that is disposed in the housing and that enables the gas to be

delivered from the lower side of the burner body to the mixing chamber, and a gas inlet line that delivers the gas to the injector.

[0010] The cooking device of the present invention comprises the injector that has

[0011] - a first extension that is disposed into the housing,

[0012] - a second extension that extends from the base of the burner body towards the burner head in the vertical direction when the first extension is placed into the housing, and

[0013] - a collar that connects the first extension and the second extension to each other.

[0014] When the injector is placed into the burner body, the first extension is fitted into the housing and the second extension extends perpendicularly from the base of the burner body towards the burner head. The second extension that is preferably longer than the collar provides a suitable area on the injector for the connection of the hose of the leakproofness control device. Thus, the leakproofness control device is connected to the cooking device by means of the second extension and the leakproofness of the cooking device can be easily controlled. Moreover, by producing the second extension in different sizes determined by the producer according to the cooking device, problems such as flame lift-off and flashback are prevented.

[0015] In an embodiment of the present invention, the cooking device comprises a regulator that controls the delivery of gas from the network to the gas inlet line. The pressure of the gas leaving the regulator to be delivered to the second extension through the gas inlet line can be measured by means of a pressure measurement device that is disposed on the second extension.

[0016] In another embodiment of the present invention, the injector comprises a channel that extends along the first extension, the second extension and the collar. The channel have two open ends that open to the gas inlet line and the mixing chamber. The gas delivered from the gas inlet line to the injector is carried along the injector by means of the channel and then delivered to the mixing chamber.

- [0017] In another embodiment of the present invention, the cooking device comprises the cylindrical second extension. The cylindrical form of the second extension provides that the leakproofness control devices and the pressure measurement devices having hoses with circular cross-sections can be connected to the second extension and thus the relevant controls can be realized.
- [0018] In another embodiment of the present invention, the injector comprises an outlet port that is arranged in the channel so as to be on the second extension. By means of the preferably frustoconical outlet port that opens into the mixing chamber, the flow rate of the gas delivered into the mixing chamber through the injector is increased, and the gas is enabled to be efficiently mixed with air in the mixing chamber.
- [0019] In another embodiment of the present invention, the cooking device comprises screw threads that are arranged on the first extension and the housing and that enable the injector to be disposed into the burner body by being screwed. In this embodiment the collar is in the form of a nut. The injector is leakproofingly mounted to the burner body by means of the screw threads. Thus, the accuracy of the measurement performed via the second extension is improved.
- [0020] In another embodiment of the present invention, the cooking device comprises the injector that is used as the pressure measurement point. The pressure measurement device is connected to the second extension by means of a hose, and the gas pressure is measured by means of the second extension. Thus, the injector is enabled to be used as the pressure measurement point that must be provided on the cooking device in compliance with the standards. The pressure of the gas delivered by the regulator to the gas line can be controlled through the injector.
- [0021] In another embodiment of the present invention, the cooking device comprises the injector that is used as the leakproofness test gas intake point. The leakproofness control device is connected to the second extension by means of a hose, and the leakproofness test is realized by means of the second extension. Thus, the need for connecting the leakproofness control device to the gas inlet line or the regulator for

conducting the leakproofness test is eliminated, and the leakproofness test is enabled to be realized through the injector.

[0022] In another embodiment of the present invention, the cooking device comprises the collar in a form suitable for mounting with a wrench, that enables the injector to be mounted to/dismounted from the burner body. Thus, the injector is enabled to be tightly mounted to the burner body and a leak-proof structure is provided between the injector and the burner body.

[0023] By means of the present invention, the leakproofness control and the pressure measurement of the cooking device are realized through the second extension disposed on the injector. Thus, the need for making a connection onto the regulator for the leakproofness control and the pressure measurement is eliminated, and it is provided that the leakproofness control and the pressure measurement are more easily and quickly performed through the second extension. Moreover, by means of the second extension, the problems of flame lift-off and flashback are prevented.

[0024] The cooking device realized in order to attain the aim of the present invention is illustrated in the attached figures, where:

[0025] Figure 1 – is the perspective view of a cooking device.

[0026] Figure 2 – is the perspective view of the cooking device in an embodiment of the present invention.

[0027] Figure 3 – is the perspective view of the burner when the injector is in the burner body in an embodiment of the present invention.

[0028] Figure 4 – is the perspective view of the burner before the injector is placed into the burner body in an embodiment of the present invention.

[0029] Figure 5 – is the perspective view of the burner in an embodiment of the present invention.

[0030] Figure 6 – is the cross-sectional view of the injector in an embodiment of the present invention.

[0031] The elements in the figures are numbered as follows:

1. Cooking device
2. Burner

3. Burner body
4. Mixing chamber
5. Burner head
6. Housing
7. Injector
8. Gas inlet line
9. First extension
10. Second extension
11. Collar
12. Channel
13. Outlet port
14. Regulator

[0032] The cooking device (1) comprises a burner (2) that generates flame by the flammable gases being burned, that enables the cooking container placed thereon to be heated and that has

[0033] - a burner body (3) that has a mixing chamber (4) wherein the gas and the ambient air are mixed,

[0034] - a burner head (5) that is disposed on the burner body (3) and that enables the flame to be delivered to the base of the cooking container from the holes that are disposed around the burner head (5),

[0035] - a housing (6) that is arranged at the base of the burner body (3),

[0036] - an injector (7) that is disposed in the housing (6) and that enables the gas to be delivered from the lower side of the burner body (3) to the mixing chamber (4), and a gas inlet line (8) that delivers the gas to the injector (7)

[0037] (Figure 2 and Figure 5).

[0038] The cooking device (1) of the present invention comprises the injector (7) that has

[0039] - a first extension (9) that is disposed into the housing (6),

[0040] - a second extension (10) that extends from the base of the burner body (3) towards the burner head (5) in the vertical direction when the first extension (9) is placed into the housing (6), and

[0041] - a collar (11) that connects the first extension (9) and the second extension (10) to each other

[0042] (Figure 4 and Figure 6).

[0043] In the cooking device (1) of the present invention, the gas received from the network is delivered to the burner (2) through the gas inlet line (8). The gas that is delivered from the injector (7) is mixed with the air taken from the outer environment in the mixing chamber (4). The gas-air mixture created in the mixing chamber (4) is transferred from the mixing chamber (4) to the burner head (5). When the injector (7) is placed into the housing (6), the first extension (9) disposed at one end of the collar (11) is entirely fitted into the housing (6) and the collar (11) is seated onto the base of the burner body (3). The second extension (10) that is disposed at the other end of the collar (11) extends to the mixing chamber (4) in the vertical direction from the base of the burner body (3) towards the burner head (5). During the leakproofness control of the cooking device (1), the hose of the leakproofness control device is fitted onto the second extension (10) of the injector (7), extending outwards. Thus, the leakproofness control is conducted through the second extension (10) with requiring to connect the leakproofness control device to the gas inlet line (8).

[0044] In an embodiment of the present invention, the cooking device (1) comprises a regulator (14) that controls the delivery of gas from the network to the gas inlet line (8). The pressure of the gas leaving the regulator (14) to be delivered to the second extension (10) through the gas inlet line (8) can be measured by means of a pressure measurement device that is disposed on the second extension (10). By fitting the hose of the pressure measurement device onto the second extension (10), the pressure of the gas leaving the regulator (14) can be controlled and thus, by means of the second extension (10), a pressure measurement point is created on the cooking device (1).

[0045] In another embodiment of the present invention, the injector (7) comprises a channel (12) that extends along the first extension (9), the second extension (10) and the collar (11). By means of the channel (12) with one end opening to the gas inlet line (8) and the other end to the mixing chamber (4), the gas carried to the burner body (3) through the gas inlet line (8) advances through the channel (12) to be delivered to the mixing

chamber (4). The leakproofness of the gas line that starts from the regulator (14) and extends along the gas inlet line (8) and the injector (7) is controlled by means of the leakproofness control device connected onto the second extension (10) that can be easily accessed from outside the cooking device (1). Thus, the safety of the cooking device (1) is more easily and quickly controlled.

[0046] In another embodiment of the present invention, the cooking device (1) comprises the cylindrical second extension (10). By means of the cylindrical form of the second extension (10), the gas leak from between the second extension (10) and the circular extension fitted over the second extension (10) is prevented during the leakproofness control and the pressure measurement. Thus, the leakproofness of the cooking device (1) is efficiently controlled.

[0047] In another embodiment of the present invention, the injector (7) comprises an outlet port (13) that is arranged in the channel (12) so as to be on the second extension (10). The outlet port (13) opens into the mixing chamber (4) and enables the gas delivered from the injector (7) into the mixing chamber (4) to be efficiently mixed with air in the mixing chamber (4) (Figure 6). The preferably flat cylinder-shaped outlet port (13) is produced with different cross-sections determined by the producer according to the type of gas used in the cooking device (1).

[0048] In another embodiment of the present invention, the cooking device (1) comprises screw threads that are arranged on the first extension (9) and the housing (6) and that enable the injector (7) to be disposed into the burner body (3) by being screwed. By means of the screw threads, the injector (7) is airtightly fitted into the housing (6). Thus, the entire gas received from the regulator (14) passes through the injector (7) to be delivered to the mixing chamber (4), and the accuracy of the pressure measurement conducted through the second extension (10) is ensured.

[0049] In another embodiment of the present invention, the cooking device (1) comprises the injector (7) that is used as the pressure measurement point. The pressure measurement device is connected to the second extension (10) by means of a hose, and the gas pressure is measured by means of

the second extension (10). Thus, the injector (7) provides the pressure measurement point on the cooking device (1).

- [0050] In another embodiment of the present invention, the cooking device (1) comprises the injector (7) that is used as the leakproofness test gas intake point. The leakproofness control device is connected to the second extension (10) by means of a hose, and the leakproofness test is realized by means of the second extension (10). Thus, the injector (7) provides the leakproofness gas inlet point on the cooking device (1).
- [0051] In another embodiment of the present invention, the cooking device (1) comprises the collar (11) in a form suitable for mounting with a wrench, that enables the injector (7) to be mounted to/dismounted from the burner body (3). The preferably nut-shaped collar (11) enables the injector (7) to be mounted to/dismounted from the burner body (3) by means of a wrench. Thus, the mounting of the injector (7) to the burner body (3) is facilitated.
- [0052] In the cooking device (1) of the present invention, by means of the second extension (10), extending to the mixing chamber (4), of the injector (7), the leakproofness test can be conducted through the injector (7). Moreover, by means of the second extension (10), a pressure measurement point is created on the cooking device (1) and the control of the regulator (14) by means of the pressure measurement test can be realized through the second extension (10).

Claims

1. A cooking device (1) **comprising** a burner (2) that generates flame by the flammable gases being burned, that enables the cooking container placed thereon to be heated and that has
 - a burner body (3) that has a mixing chamber (4) wherein the gas and the ambient air are mixed,
 - a burner head (5) that is disposed on the burner body (3) and that enables the flame to be delivered to the base of the cooking container from the holes that are disposed around the burner head (5),
 - a housing (6) that is arranged at the base of the burner body (3),
 - an injector (7) that is disposed in the housing (6) and that enables the gas to be delivered from the lower side of the burner body (3) to the mixing chamber (4), and a gas inlet line (8) that delivers the gas to the injector (7).**characterized by** the injector (7) that has
 - a first extension (9) that is disposed into the housing (6),
 - a second extension (10) that extends from the base of the burner body (3) towards the burner head (5) in the vertical direction when the first extension (9) is placed into the housing (6), and
 - a collar (11) that connects the first extension (9) and the second extension (10) to each other.
2. A cooking device (1) as in Claim 1, **characterized by** a regulator (14) that regulates the delivery of gas from the network to the gas inlet line (8).
3. A cooking device (1) as in Claim 1 or 2, **characterized by** the injector (7) comprising a channel (12) that extends along the first extension (9), the second extension (10) and the collar (11).
4. A cooking device (1) as in any one of the claims 1 to 3, **characterized by** the cylindrical second extension (10).
5. A cooking device (1) as in Claim 3 or 4, **characterized by** the injector (7) comprising an outlet port (13) that is positioned in the channel (12) so as to be on the second extension (10).
6. A cooking device (1) as in any one of the above claims, **characterized by** screw threads that are arranged on the first extension (9) and the housing (6) and that enable the injector (7) to be disposed into the burner body (3) by being

screwed.

7. A cooking device (1) as in any one of the above claims, **characterized by the injector (7) that is used as the pressure measurement point.**
8. A cooking device (1) as in any one of the above claims, **characterized by the injector (7) that is used as the leakproofness test gas inlet point.**
9. A cooking device (1) as in any one of the above claims, **characterized by the collar (11) in a form suitable for mounting with a wrench, that enables the injector (7) to be mounted to/dismounted from the burner body (3).**

Figure 1

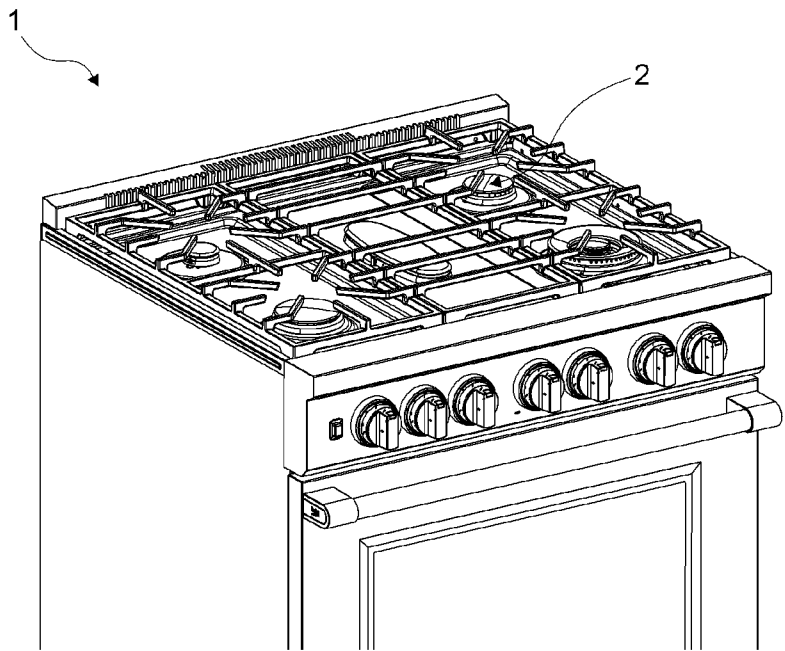


Figure 2

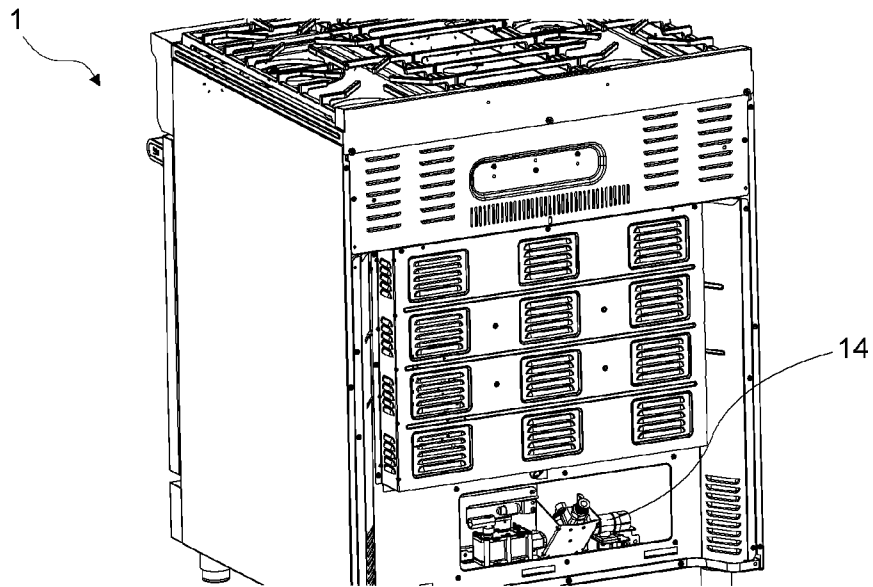


Figure 3

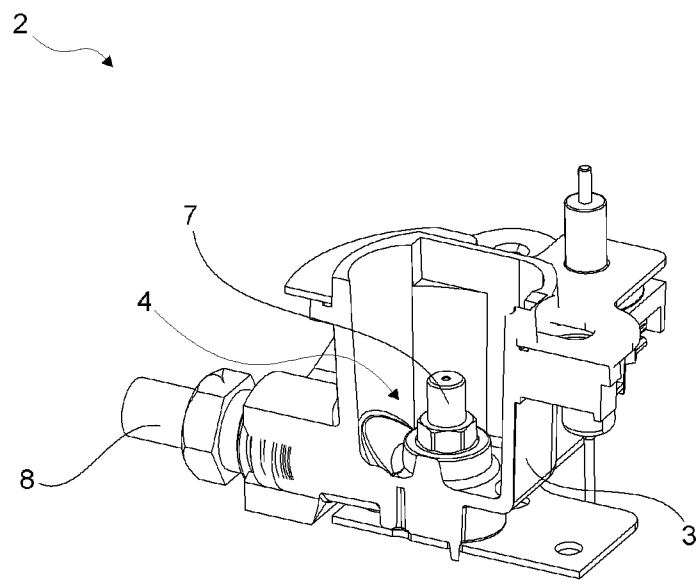


Figure 4

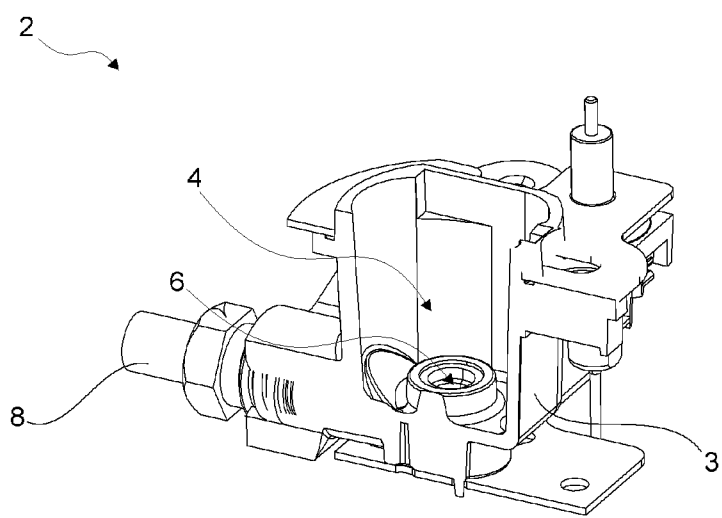


Figure 5

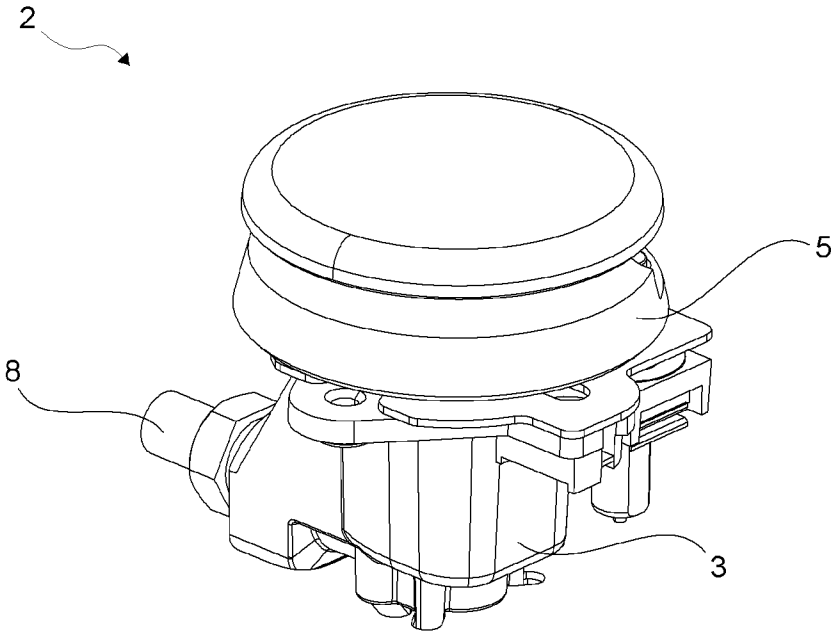
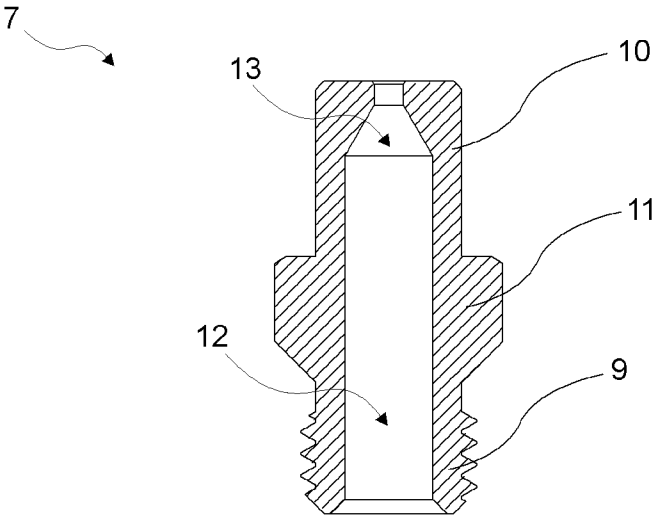


Figure 6



INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2017/063997

A. CLASSIFICATION OF SUBJECT MATTER

INV. F23D14/06 F23D14/64
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
F23D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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X	WO 2014/207782 A1 (RINNAI KK [JP]) 31 December 2014 (2014-12-31) abstract; figures 1,2 -----	1-9
X	JP 2013 142500 A (RINNAI KK) 22 July 2013 (2013-07-22) figures 1,2 -----	1-6,9
X	JP S53 35448 U ([JP]) 28 March 1978 (1978-03-28) figures 1-3 -----	1-6,9
X	EP 1 666 793 A1 (BRANDT IND SAS [FR]) 7 June 2006 (2006-06-07) column 4, paragraph 23 - column 5, paragraph 30 figures 1,2 ----- -/-	1-3,5,6



Further documents are listed in the continuation of Box C.



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Date of the actual completion of the international search

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31/08/2017

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INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2017/063997

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 994 301 A1 (BRANDT COOKING [FR]) 19 April 2000 (2000-04-19) column 7, paragraph 29 - paragraph 30 figures 3,4 -----	1-3,5,6
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

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