

(19)



(11)

EP 3 683 505 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
22.07.2020 Bulletin 2020/30

(51) Int Cl.:
F24C 14/00 ^(2006.01) **F24C 15/32** ^(2006.01)

(21) Application number: **19382029.7**

(22) Date of filing: **17.01.2019**

(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

(72) Inventors:
• **TORNÉ PICAPAL, Albert**
25123 TORREFARRERA (Lleida) (ES)
• **SANTALLUSIA CASTELLS, Josep**
25123 TORREFARRERA (Lleida) (ES)

(74) Representative: **Herrero & Asociados, S.L.**
Cedaceros, 1
28014 Madrid (ES)

(71) Applicant: **Inmobles del Segria, S.L.**
25123 Torrefarrera (Lerida) (ES)

(54) **SYSTEM FOR DISPERSING CHEMICAL AGENTS IN OVENS**

(57) The system for dispersing chemical agents in ovens comprises a first tube (4) for injecting water so that said water is dissolved with the chemical agent (1); a fan (2) for distributing the mixture of water and chemical agent (1) in a heat-generating area (8) and a cooking area (7) of the oven; and means for rinsing the mixture of water and chemical agent (1); wherein said first tube (4) for injecting water is actuated by a spraying solenoid

valve (15) which also produces steam when the water is injected; and wherein said means for rinsing the mixture of water and chemical agent (1) comprise a second tube (12) for injecting water, the water injection of which is actuated by a rinsing solenoid valve (11).

It enables a cheaper dispersion system for ovens to be provided.

EP 3 683 505 A1

Description

[0001] The present invention relates to a system for dispersing chemical agents in ovens, in particular professional ovens for fine cuisine and hotels, using a chemical agent in a solid format without recirculation in the oven.

Background of the invention

[0002] Professional ovens are specialised machines for cooking and processing food with a very wide and very precise control over the conditions inside the cooking chamber. They enable the control of the temperature, the stability thereof, both at very low and high temperatures, the moisture, the steam convection, the homogeneity inside the oven, etc.

[0003] Most professional ovens have self-cleaning systems that enable the oven to wash itself at the end of the day.

[0004] Professional ovens are usually equipped with self-cleaning systems, based on the introduction of degreasing elements in the cooking cavity of the oven, which act on the present dirtiness, dissolving it and subsequently removing it through the drain.

[0005] Apart from cleaning, other cycles can be performed, such as polishing or decalcification depending on the chemical agent used.

[0006] There are two basic types of self-cleaning: without recirculation and with recirculation.

[0007] The self-cleaning system without recirculation is generally made up of one or more sprinklers of chemical agents in the upper portion of the cooking chamber. The chemical agent sprayed is usually liquid, and it is carried to the area of the sprinkler by means of a pump.

[0008] The sprinkler sprays the entire cooking chamber, usually in a rotating manner. During this process, a convection fan is turned off in order to prevent the flow of the chemical agent from being deviated by the air flow.

[0009] Once sprayed, the chemical agent is left to rest for a certain period of time under ideal temperature and moisture conditions in order for the desired effect to be produced.

[0010] After this time has passed, the rinsing will be performed by means of a solenoid valve which injects tap water into the sprinkler or other sprinklers/sprayers distributed in the cooking chamber.

[0011] It should be noted that in this type of cleaning, the leftover chemical agent is removed through a drain. Furthermore, the cleaning of the heat-generating area is poor, since the sprinkler is separated therefrom by a protective plate and, therefore, the chemical agent barely arrives at the heat-generating area.

[0012] A reduced version of this cleaning system must be made up of, at least, the following electromechanical elements:

- Pump for chemical agent

- Rinsing solenoid valve

[0013] Furthermore, it should include, at least, one rotating sprinkler, which adds cost to the system.

5 **[0014]** As for the self-cleaning system with recirculation, it is usually made up of one or several outlet points of the liquid recirculated in the upper portion of the cooking chamber.

[0015] Usually, solid chemical agent is used, in tablet or powder form, which is deposited in the cooking chamber for the dissolving thereof. However, liquid chemical agent can also be used. In that case, the liquid chemical agent is carried to the inside of the oven with an additional pump.

15 **[0016]** A solenoid valve is responsible for filling a collector, and once the chemical agent has been diluted with this water, a pump is responsible for carrying the mixture to the recirculation outlet, which is dispersed by mechanical elements, and distributed throughout all the area for cooking and for generating heat by means of the very convection fan of the oven.

[0017] This process of recirculating the mixture continues for a certain period of time under ideal temperature and moisture conditions for the desired effect to be produced. During the process of recirculating the mixture, a convection fan is generally operating in order to spread it throughout the cooking chamber and the heat-generating area.

25 **[0018]** After a time, the emptying of the collector is performed, and it is once again filled with tap water through a solenoid valve. Once this is done, the water is recirculated in order to rinse the oven. It is probable that the emptying and rinsing process must be repeated several times in order to ensure optimal rinsing.

30 **[0019]** In this type of self-cleaning it does correctly clean the heat-generating area, but the cost of the system is higher, since it needs a collector, pumps to recirculate and empty it, filling solenoid valve, etc.

35 **[0020]** A reduced version of this cleaning system must be made up of, at least, the following electromechanical elements:

- Recirculation pump
- Emptying pump
- 45 - Solenoid valve for filling the collector

[0021] Furthermore, a large collector must be included, which adds cost to the system.

50 **[0022]** Therefore, an objective of the present invention is to provide a dispersion system for ovens that is cheaper than the current dispersion systems.

Description of the invention

55 **[0023]** The dispersion system of the invention resolves the aforementioned drawbacks and has other advantages which are described below.

[0024] The system for dispersing chemical agents in

ovens according to the present invention comprises:

a first tube for injecting water so that said water is dissolved with the chemical agent;
 a fan for distributing the mixture of water and chemical agent in a heat-generating area and a cooking area of the oven; and
 means for rinsing the mixture of water and chemical agent;
 wherein said first tube for injecting water is actuated by a spraying solenoid valve which also produces steam when the water is injected; and
 wherein said means for rinsing the mixture of water and chemical agent comprise a second tube for injecting water, the water injection of which is actuated by a rinsing solenoid valve.

[0025] Advantageously, said fan is a convection fan of the very oven.

[0026] Furthermore, said chemical agent, for example, in the form of a tablet, is placed in at least one vessel, forming a collector. Preferably, said at least one vessel is placed substantially centred with respect to said fan.

[0027] In order to facilitate the inlet of water, said at least one vessel comprises upper openings for the inlet of water.

[0028] Furthermore, said at least one vessel comprises an overflow hole for supplying the mixture of water and chemical agent from the at least one vessel to the fan, dispersing the mixture in the heat-generating area and the cooking area of the oven.

[0029] Preferably, the first tube for injecting water comprises a deflector for diverting the water in order to reach all the heat-generating and cooking area of the oven, and an outlet hole located between the heat-generating area and the cooking area of the oven.

[0030] Moreover, the cooking area of the oven comprises an opening located in the upper portion thereof which receives the air flow generated by said fan.

[0031] With respect to the systems without recirculation, the advantages of the invention are:

- Lower cost, since neither the pump nor the sprinkler are necessary.
- Use of solid detergent: lower transportation and storage costs, as well as greater safety.

[0032] With respect to the systems with recirculation, the advantages of the invention are:

- Lower cost, since neither the recirculation and emptying pumps nor the collector are necessary.
- Greater degreasing power, since the dilution is highly concentrated.
- Less time needed to perform a cleaning process.

Brief description of the drawings

[0033] To better understand what has been set forth above, several drawings schematically depicting only by way of non-limiting example a practical embodiment are attached.

Figure 1 is a front elevation view of an oven including the dispersion system according to the present invention;

Figure 2 is a perspective view of a cross section of a portion of the oven of Figure 1;

Figure 3 is a perspective view of a cross section of the portion shown in Figure 2 with greater detail with the chemical agent placed in the use position thereof; Figure 4 is a perspective view of a cross section showing the dispersion system according to the present invention; and

Figure 5 is an elevation view of a cross section of an oven including the dispersion system according to the present invention.

Description of a preferred embodiment

[0034] The present invention describes a system for dispersing chemical agents in a solid format without recirculation in an oven. These chemical agents can have different purposes, such as the cleaning of the oven, decalcification, polishing, anti-rust treatments, etc.

[0035] The chemical agent 1, for example, in tablet form, is placed in the centre of a convection fan 2 of the oven in one or several vessels 3, which are preferably inclined in order for the chemical agent 1 to fit therein and not come out due to vibrations or turbulence in the air.

[0036] In the upper portion of the vessel there is a first tube for injecting water 4, also used for generating steam, which will be activated when it is necessary to dissolve the chemical agent 1.

[0037] The bottom of this inclined vessel 3 is closed, such that it acts as a collector 5. By actuating a solenoid valve 15, the chemical agent 1 with water is sprayed through the first tube 4.

[0038] The water dilutes the chemical agent 1 in a controlled manner, the dilution staying in the bottom of the collector 5 defined by the vessel 3. As the chemical agent 1 becomes increasingly diluted, the mixture of water and the chemical agent 1 in the collector 5 overflows from a hole 6.

[0039] This liquid, containing the mixture of the chemical agent 1 with water, is sucked through the convection fan 2, and distributed in all the cooking 7 and heat-generating 8 area of the oven. The side portion 9 and the rear portion 10 of the vessel 3 must be such that they prevent the penetration of the chemical agent 1 without dissolving in the convection fan 2.

[0040] In the preferred embodiment, the rear portion 10 of the vessel 3 is solid or filled in (meaning without holes), except for the hole 6 through which the mixture

overflows, since this prevents the dispersion of the water flow towards the convection fan 2 and facilitates the dissolution of the chemical agent 1.

[0041] The side portion 9 can have openings and the upper portion 17 can also have several openings 18 through which the first tube 4 sprays the chemical agent 1 inside the vessel 3 with water.

[0042] Once dissolved and distributed, the chemical agent 1 is left to rest for a certain period of time under ideal temperature and moisture conditions in order for the desired effect to be produced on the heat-generating area 8 and the cooking area 7 of the oven.

[0043] After this time has passed, the rinsing is performed by activating a rinsing solenoid valve 11 which injects tap water in the upper area of the oven through a second tube for injecting water 12, the hole 13 of which is in the boundary between the cooking area 7 and the heat-generating area 8 of the oven.

[0044] When this rinsing solenoid valve 11 is activated, a jet of water is directed at a deflector 14 strategically placed so it can reach all the cooking 7 and heat-generating 8 area of the oven.

[0045] The air generated by the convection fan 2 is directed to the upper portion of the cooking area 7 through an opening 16 close to the outlet hole 13 for water and a deflector 14.

[0046] This air flow helps the water to be distributed throughout all the heat-generating 8 and cooking 7 area of the oven, performing the rinsing in an effective manner.

[0047] Despite the fact that reference has been made to a specific embodiment of the invention, it is evident for the person skilled in the art that numerous variations and changes may be made to the dispersion system described, and that all the aforementioned details may be substituted by other technically equivalent ones, without detracting from the scope of protection defined by the attached claims.

Claims

1. A system for dispersing chemical agents in ovens, comprising:

a first tube (4) for injecting water so that said water is dissolved with the chemical agent (1);
a fan (2) for distributing the mixture of water and chemical agent (1) in a heat-generating area (8) and a cooking area (7) of the oven; and
means for rinsing the mixture of water and chemical agent (1);

characterised in that said first tube (4) for injecting water is actuated by a spraying solenoid valve (15) which also produces steam when the water is injected; and

in that said means for rinsing the mixture of water and chemical agent (1) comprise a second tube (12) for injecting water, the water injection

of which is actuated by a rinsing solenoid valve (11).

2. The system for dispersing chemical agents in ovens according to claim 1, wherein said fan (2) is a convection fan.
3. The system for dispersing chemical agents in ovens according to claim 1, wherein said chemical agent (1) is placed in at least one vessel (3), forming a collector (6).
4. The system for dispersing chemical agents in ovens according to claim 1, wherein said at least one vessel (3) is placed substantially centred with respect to said fan (2).
5. The system for dispersing chemical agents in ovens according to claim 3, wherein said at least one vessel (3) comprises upper openings (18) for the inlet of water.
6. The system for dispersing chemical agents in ovens according to claim 3, wherein said at least one vessel (3) comprises an overflow hole (6) for supplying the mixture of water and chemical agent (1) from the at least one vessel (3) to the fan (2), dispersing the mixture in the heat-generating area (8) and the cooking area (7) of the oven.
7. The system for dispersing chemical agents in ovens according to claim 1, wherein the first tube (4) for injecting water comprises a deflector (14) for diverting the water in order to reach all the heat-generating (8) and cooking (7) area of the oven.
8. The system for dispersing chemical agents in ovens according to claim 1, wherein the first tube (4) for injecting water comprises an outlet hole (13) located between the heat-generating area (8) and the cooking area (7) of the oven.
9. The system for dispersing chemical agents in ovens according to claim 1, wherein the cooking area (7) of the oven comprises an opening (16) located in the upper portion thereof which receives the air flow generated by said fan (2).

FIG. 1

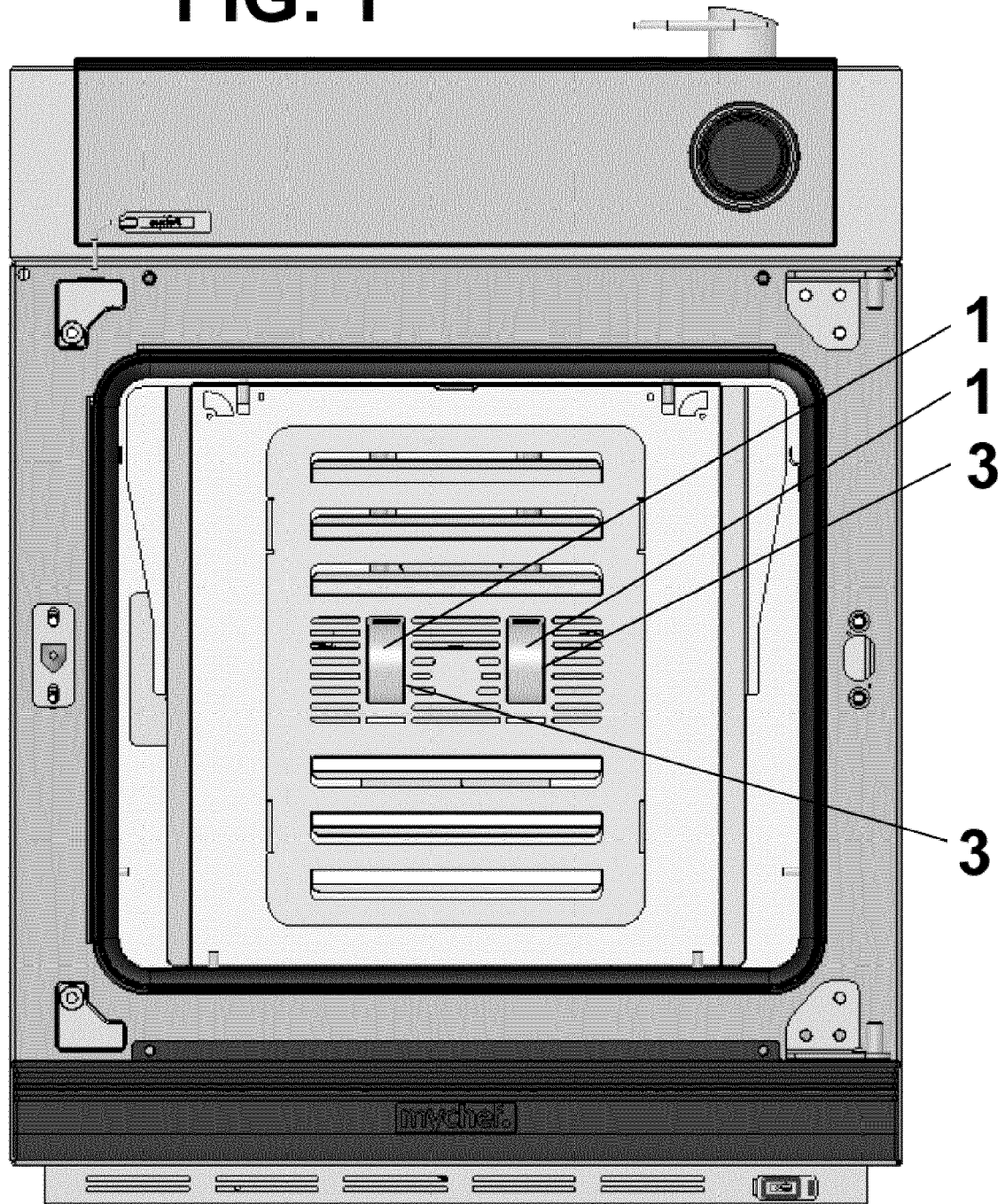


FIG. 2

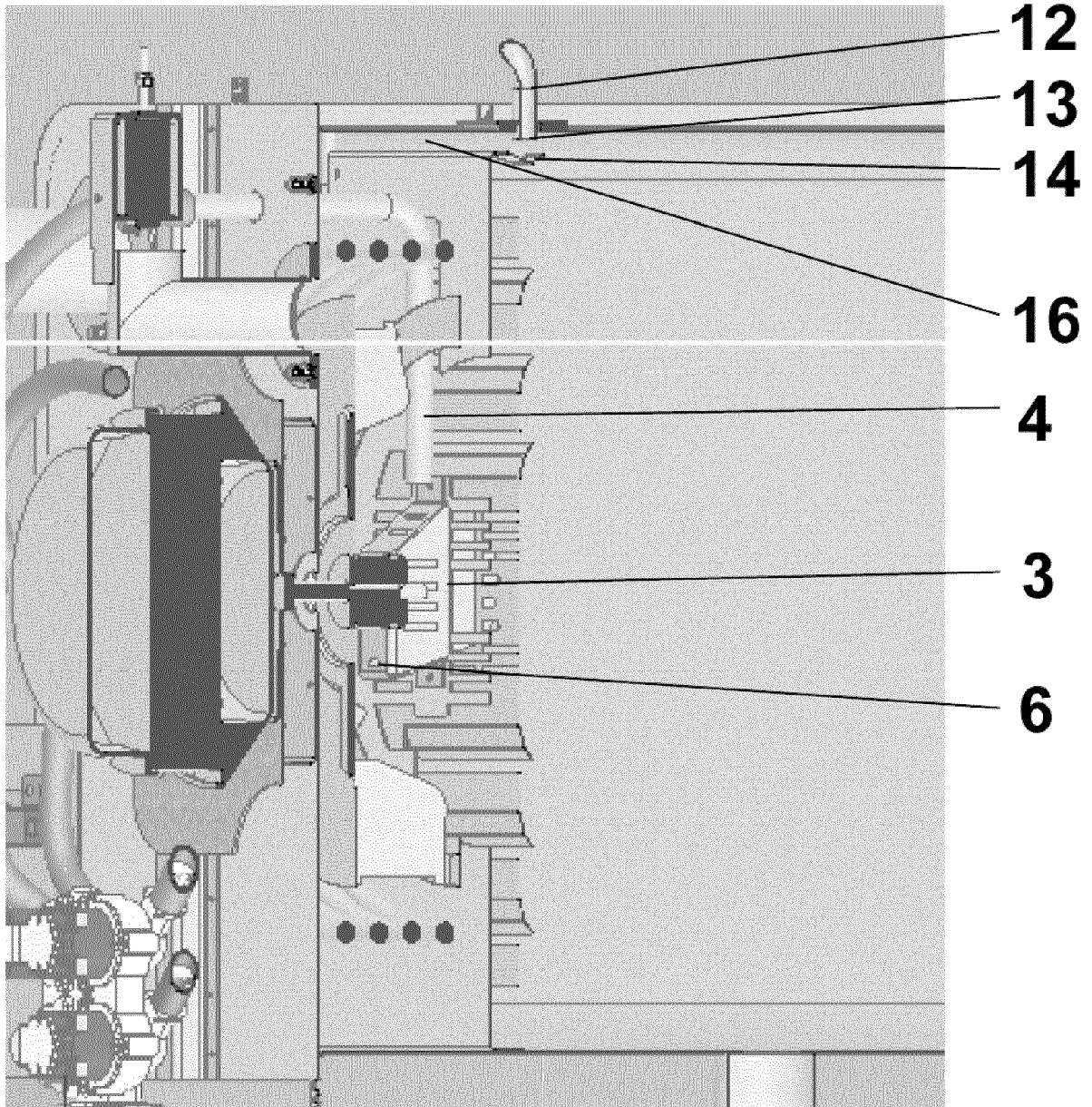
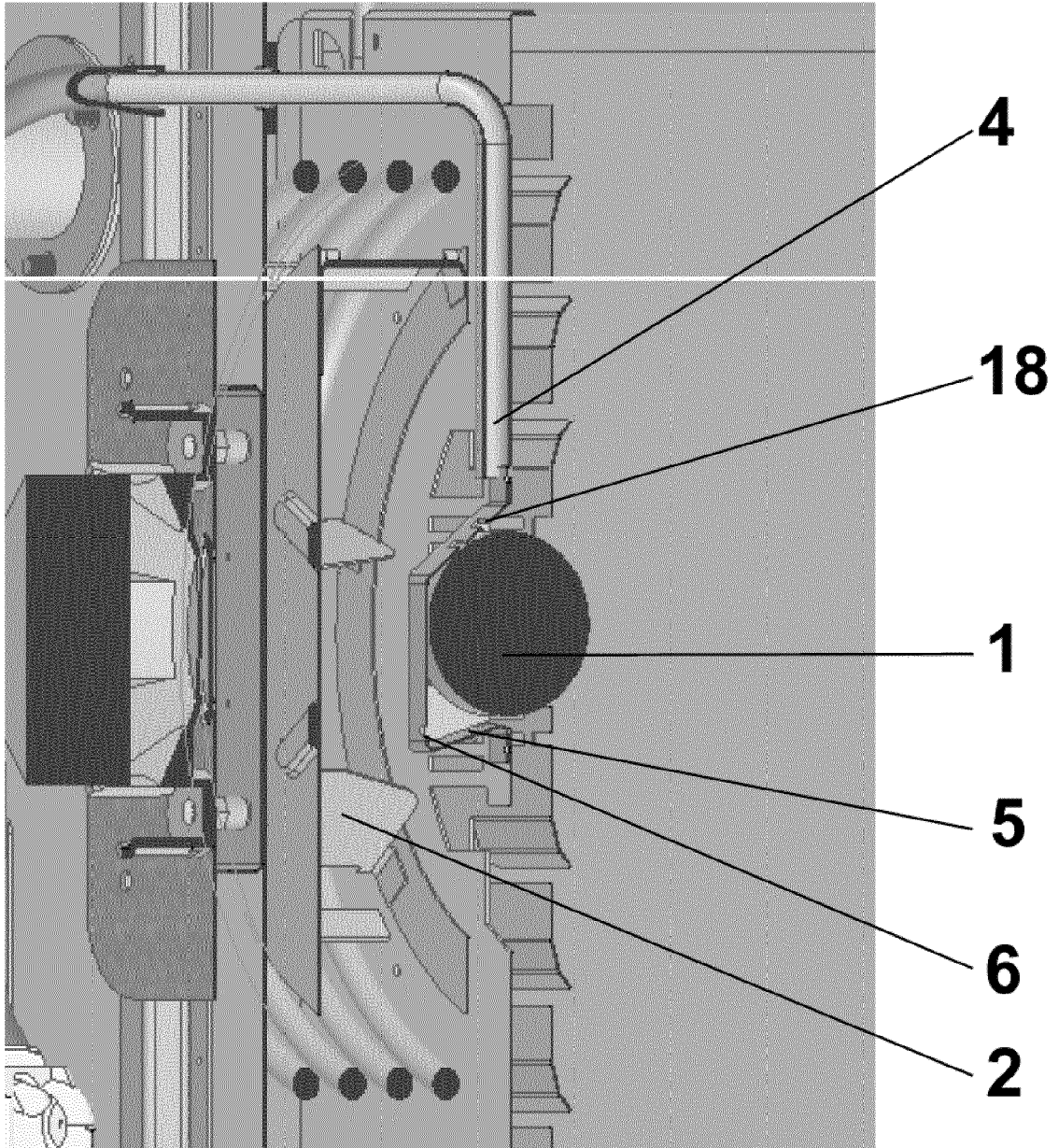


FIG. 3



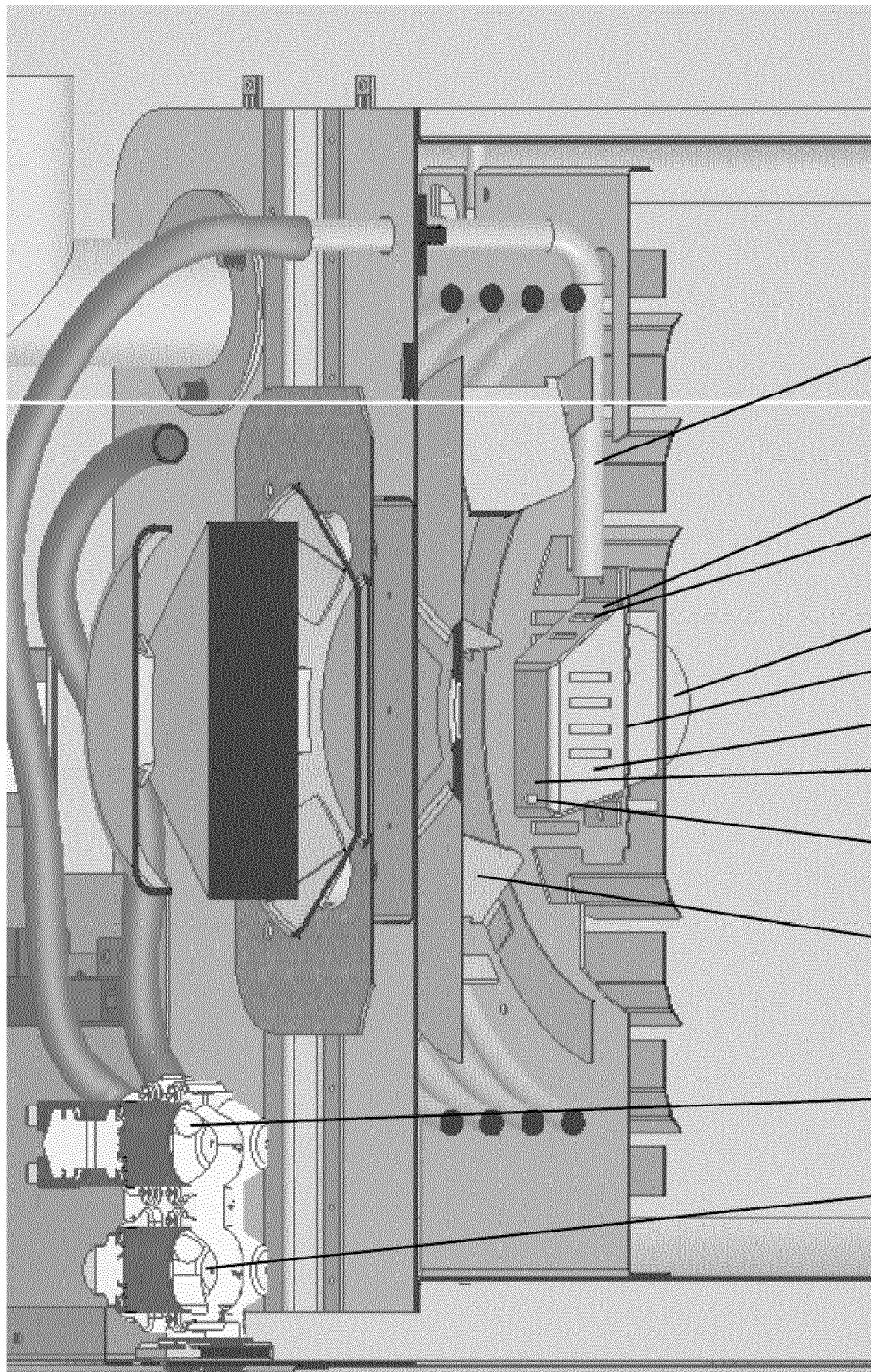
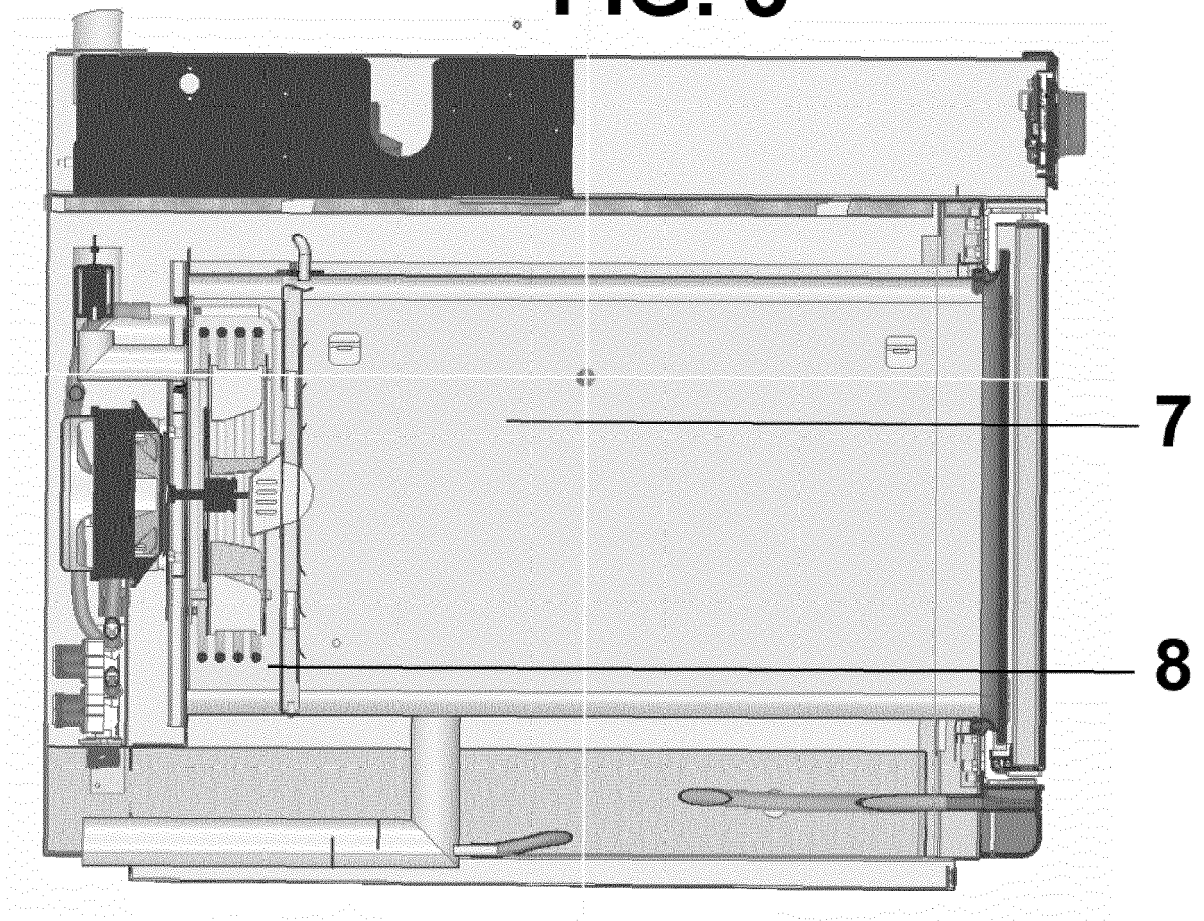


FIG. 5





EUROPEAN SEARCH REPORT

Application Number
EP 19 38 2029

5

10

15

20

25

30

35

40

45

50

55

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2008/223357 A1 (BARTELUCK JANUS [US] ET AL) 18 September 2008 (2008-09-18) * figures 1, 2, 3, 4, 5, 6 * * paragraphs [0003], [0004], [0008], [0023], [0026], [0027], [0028], [0039], [0030], [0040] * -----	1-6,8,9	INV. F24C14/00 ADD. F24C15/32
X	EP 0 892 220 A1 (WIESHEU GMBH [DE]) 20 January 1999 (1999-01-20) * column 1, line 3 - column 1, line 18 * * column 2, line 12 - column 2, line 14 * * column 2, line 40 - column 2, line 45 * * column 3, line 41 - column 3, line 50 * * column 4, line 17 - column 4, line 20 * * column 5, line 4 - column 5, line 13 * * column 6, line 44 - column 6, line 45 * * column 6, line 49 - column 6, line 58 * * column 7, line 11 - column 7, line 26 * * column 7, line 33 - column 7, line 38 * * column 8, line 18 - column 8, line 22 * * column 8, line 31 - column 8, line 39 * * column 9, line 13 - column 9, line 18 * -----	1-4,8,9	TECHNICAL FIELDS SEARCHED (IPC) F24C
A	EP 0 801 271 A1 (WIESHEU WIWA GMBH [DE]) 15 October 1997 (1997-10-15) * column 1, line 3 - column 1, line 6 * * column 1, line 24 - column 1, line 28 * * column 1, line 40 - column 1, line 43 * * column 1, line 48 - column 2, line 2 * * column 4, line 32 - column 4, line 42 * * column 4, line 54 - column 5, line 23 * * column 5, line 32 - column 5, line 44 * * column 6, line 39 - column 6, line 45 * * column 7, line 19 - column 7, line 30 * * column 7, line 35 - column 7, line 39 * -----	1-9	
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 24 June 2019	Examiner Jalal, Rashwan
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	

EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 19 38 2029

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

24-06-2019

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2008223357 A1	18-09-2008	NONE	
EP 0892220 A1	20-01-1999	DE 19730610 C1 EP 0892220 A1	22-10-1998 20-01-1999
EP 0801271 A1	15-10-1997	DE 19614439 A1 EP 0801271 A1	16-10-1997 15-10-1997