(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 3 002 516 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
06.04.2016 Bulletin 2016/14

(21) Application number: **15002299.4**

(22) Date of filing: **02.08.2015**

(51) Int Cl.:
F23N 5/00 *(2006.01)* ***F23N 5/02*** *(2006.01)*
F23N 5/24 *(2006.01)* ***F23D 3/18*** *(2006.01)*
F23D 3/28 *(2006.01)* ***F23D 3/26*** *(2006.01)*

(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:
MA

(30) Priority: **30.09.2014 KR 20140131363**

(71) Applicant: **Paseco Co., Ltd.**
Gyeonggi-do 425-851 (KR)

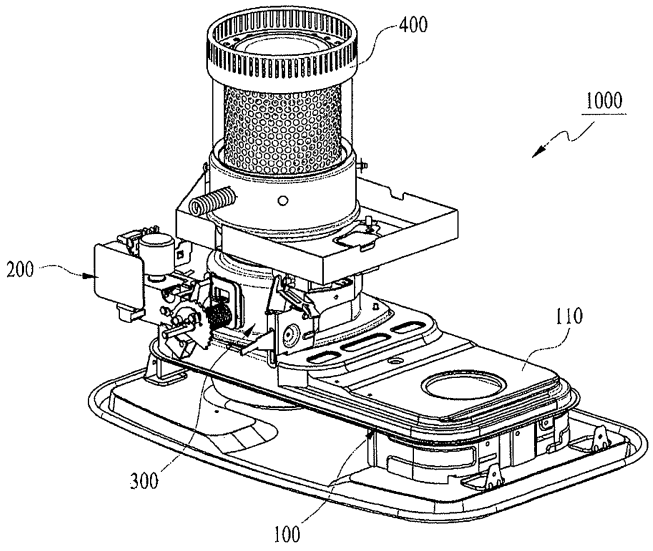
(72) Inventor: **Hong, Soon Il**
425-851 Gyeonggi-do (KR)

(74) Representative: **Hannig, Wolf-Dieter**
Cohausz Hannig Borkowski Wißgott
Patentanwaltskanzlei GbR
Friedlander Straße 37
12489 Berlin (DE)

(54) HEATER HAVING AUTOMATIC FIRE EXTINGUISHER

(57) Disclosed is a heater having an automatic fire extinguisher, the heater including: a heater body including a fuel tank; a wick elevation unit fixed to the heater body and having an outer container having an opened upper end and a hollow air tank installed to be spaced apart from an inner surface of the outer container and having an opening at an upper end thereof, for elevating a wick between the outer container and the air tank; a combustion tank disposed at an upper end of the wick elevation unit; a vent cap for opening and closing the opening at the upper end of the air tank, a temperature detection unit installed on the bottom surface of the vent cap to face the hollow portion of the air tank and located on a side opposite to a side which flames face; and an automatic fire extinguisher for receiving a signal from the temperature detection unit and lowering the wick. Because the temperature detection unit faces a side opposite to a side which flames of the wick face, the temperature detection unit can be prevented from being damaged.

Fig.1



EP 3 002 516 A1

Description

BACKGROUND OF THE INVENTION

1. Field of the invention

[0001] The present invention relates to a heater having an automatic fire extinguisher, and more particularly, to a heater having an automatic fire extinguisher for automatically extinguishing fire when excessive flames are generated by wind (an external environment) or self-overheating of the heater while the heater performs a combustion operation.

2. Description of the Prior Art

[0002] In general, heaters using wicks burn fossil fuels including a liquid such as petroleum or heating oil, and perform heating operations using generated heat.

[0003] Such a heater absorbs a fuel mainly in a wick to burn the fuel directly or through a burner.

[0004] When a fuel is absorbed in a wick to be burned, the wick is installed in the interior of a combustion tank installed in the interior of the heater body and the combustion tank is coupled to an upper portion of a wick elevation unit, in which case if the exposed wick in the combustion tank is ignited using an ignition unit, air necessary for combustion is introduced from vent holes formed at a lower portion of the heater body to expedite combustion.

[0005] The user directly manipulates an extinguisher switch to allow the conventional heater operated in this way to perform an extinguishing operation.

[0006] However, when the user goes out or falls into sleep while the heater is turned on, unnecessary consumption of a fuel cannot be prevented and the user may be exposed to a danger of fire.

[0007] When the fuel is incompletely burned, carbon dioxide or carbon monoxide may be diffused into the interior of a room, in which case carbon dioxide or carbon monoxide significantly threats health of people who live in the closed interior.

[0008] In order to solve the above-mentioned problem, an automatic fire extinguisher for automatically extinguishing fire by a timer or when carbon dioxide or carbon monoxide corresponding to a preset value or more is detected by a carbon dioxide/carbon monoxide sensor is disclosed.

[0009] Meanwhile, in the conventional heater, excessive flames may be generated instantaneously or continuously for a predetermined time period due to natural wind for ventilation or artificial wind such as wind of an electric fan or due to overheating of the product itself, and thus, soot may be generated on a heat reflection unit or the like or flames become excessively high so that a danger of a fire or a burn is present.

[0010] However, because a temperature detection unit is merely installed on a side which flames face in the conventional automatic fire extinguisher for a heater, the temperature of the flames may frequently cause breakdowns of the automatic fire extinguisher, and thus the automatic fire extinguisher may not be properly operated when excessive flames are generated.

SUMMARY OF THE INVENTION

[0011] The present invention has been made in an effort to solve the above-mentioned problems, and it is an object of the present invention to provide a heater having an automatic fire extinguisher, which, by using a temperature detection unit installed on a side opposite to a side which the flames face, can prevent a breakdown thereof due to flames when excessive flames are generated instantaneously or continuously for a predetermined time period due to natural wind for ventilation or artificial wind such as wind of an electric fan or due to overheating of the product itself.

[0012] In accordance with an aspect of the present invention, there is provided a heater having an automatic fire extinguisher, the heater including: a heater body including a fuel tank; a wick elevation unit fixed to the heater body and having an outer container having an opened upper end and a hollow air tank installed to be spaced apart from an inner surface of the outer container and having an opening at an upper end thereof, for elevating a wick between the outer container and the air tank; a combustion tank disposed at an upper end of the wick elevation unit; a vent cap for opening and closing the opening at the upper end of the air tank, a temperature detection unit installed on the bottom surface of the vent cap to face the hollow portion of the air tank and located on a side opposite to a side which flames face; and an automatic fire extinguisher for receiving a signal from the temperature detection unit and lowering the wick.

[0013] The heater may further include: a support frame having a fixed plate spaced apart from a bottom surface of the vent cap, and support legs extending upwards from the fixed plate and fixed to the bottom surface of the vent cap, and the temperature detection unit may be fixedly installed on a bottom surface of the fixed plate.

[0014] The support legs may be fixed to the vent cap by inserting upper ends of the support legs into vent holes formed in the vent cap and bending the support legs.

[0015] The vent cap may have an upwardly convex shape, and the fixed plate may protrude downwards further from a lower end of the vent cap.

[0016] According to the present invention, because the temperature detection unit is installed on the bottom surface of the vent cap to face the hollow part of the air tank and is located on a side opposite to a side which flames of the wick face, the temperature detection unit can be prevented from being damaged by the flames.

[0017] Furthermore, according to the present invention, because the support frame for installing the temperature detection unit includes a fixed plate spaced apart from the bottom surface of the vent cap, and support legs

extending upwards from the fixed plate, fixed to the bottom surface of the vent cap, and upper ends thereof inserted into vent holes formed in the vent cap and bended, the support frame can be firmly fixed to the vent cap.

[0018] In particular, because the support frame may be fixed to the vent cap using the vent holes formed already, there is no burden for additional fixing costs, and the support frame can be separated, the temperature detection unit can be easily maintained and installed.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] The above and other objects, features and advantages of the present invention will be more apparent from the following detailed description taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a perspective view illustrating a heater including an automatic fire extinguisher according to the present invention;

FIG. 2 is an exploded perspective view of FIG. 1;

FIG. 3 is a bottom perspective view illustrating a coupling structure of a vent cap, a support frame, and a temperature detection unit of FIG. 2;

FIG. 4 is a top exploded perspective view of FIG. 3;

FIG. 5 is a bottom exploded perspective view of FIG. 3; and

FIG. 6 is a side view illustrating a coupling structure of the vent cap, the support frame, and the temperature detection unit of FIG. 2.

DETAILED DESCRIPTION OF THE EXEMPLARY EMBODIMENTS

[0020] Hereinafter, an exemplary embodiment of the present invention will be described with reference to FIGS. 1 to 6.

[0021] As illustrated in FIGS. 1 and 2, a heater 1000 including an automatic fire extinguisher according to the present invention includes: a heater body 100 including a fuel tank 110; a wick elevation unit 300 fixed to the heater body 100 and having an outer container 310 having an opened upper end and a hollow air tank 320 installed to be spaced apart from an inner surface of the outer container 310 and having an opening 321 at an upper end thereof, for elevating a wick 330 between the outer container 310 and the air tank 320; a combustion tank 400 disposed at an upper end of the wick elevation unit 300; a vent cap 500 for opening and closing the opening 321 at the upper end of the air tank 320, a temperature detection unit 600 installed on the bottom surface of the vent cap 500 to face the hollow portion of the air tank 320 and located on a side opposite to a side which flames face; and an automatic fire extinguisher 200 for receiving a signal from the temperature detection unit 600 and lowering the wick 330.

[0022] Because the temperature detection unit 600 is installed on the bottom surface of the vent cap 500 to face the follow portion of the air tank 320 and is located on a side opposite to the side which flames face while the wick 330 is lifted, the temperature detection unit 600 is minimally damaged by the flames.

[0023] When excessive flames in a heater are generated instantaneously or continuously for a predetermined time period due to natural wind for ventilation or artificial wind such as wind of an electric fan or due to overheating of the product itself, the interior of the combustion tank 400 is overheated so that an overheated lower portion of the combustion tank 400 is detected by the temperature detection unit 600, and when a temperature corresponding to a preset value or more is detected, a detection signal is transmitted to the automatic fire extinguisher 200 such that the automatic fire extinguisher performs an extinguishing operation.

[0024] Furthermore, as illustrated in FIGS. 3 to 6, it is preferable that the temperature detection unit 600 is spaced apart from the bottom surface of the vent cap 500 by the medium of a support frame 700.

[0025] This structure is also to space the temperature detection unit 600 apart from the combustion tank 400 as far as possible to prevent the temperature detection unit 600 from being directly damaged by overheat of the excessive flames.

[0026] To achieve this, it is preferable that the support frame 700 includes a fixed plate 710 spaced apart from the bottom surface of the vent cap 500, and support legs 720 extending upwards from the fixed plate 710 and fixed to the bottom surface of the vent cap 500.

[0027] In this case, the temperature detection unit 600 is fixedly installed on the bottom surface of the fixed plate 710 of the support frame 700 through a suitable coupling unit 770.

[0028] The temperature detection unit 600 may employ a bimetal sensor for performing an on/off operation according to a preset temperature, but also may employ a known general temperature sensor.

[0029] A plurality of legs 720 may be provided to be disposed at an interval along the circumference of the fixed plate 710.

[0030] With this configuration, the temperature detection unit 600 is prevented from being closed such that temperature can be detected more accurately.

[0031] Furthermore, the support frame 700 may be firmly fixed to the vent cap 500 by inserting upper ends of the support legs 720 into vent holes 510 formed in the vent cap 500 and bending the support legs 720.

[0032] In this way, because the support frame 700 can be fixed to the vent cap 500 using the vent holes 510 formed already, there is no burden for additional fixing costs, and the support frame 700 can be separated, the temperature detection unit 600 can be easily maintained and installed.

[0033] Of course, the support frame 700 may be installed in the vent cap 500 through a separate coupling member.

[0034] Meanwhile, it is preferable that the vent cap 500

has an upwardly convex shape and the fixed plate 710 protrudes downwards further from a lower end of the vent cap 500.

[0035] Accordingly, the temperature detection unit 600 can be prevented from being damaged by the heat of the flames introduced through auxiliary vent holes 521 formed along a circumferential side surface 520 of the vent cap 500 having an upwardly convex shape.

[0036] The automatic fire extinguisher 200 is an apparatus for automatically extinguishing flames as a detection signal is transferred to the automatic fire extinguisher 200 when the temperatures of a lower portion of the combustion tank 400 and the temperature of the hollow part of the air tank 320 detected by the temperature detection unit 600 are a preset temperature values or higher.

[0037] In more detail, the wick 330 can be lifted by rotating the wick driving shaft 210 illustrated in FIG. 1 and be ignited, and when excessive flames are generated during use of the heater, a signal is transmitted from the temperature detection unit 600 to the automatic fire extinguisher 200 to operate the automatic fire extinguisher 200, so that the wick driving shaft 210 is reversely rotated by a resilient restoring force such that the wick is lowered and extinguished.

[0038] The automatic fire extinguisher 200 illustrated in FIG. 1 is the same as an apparatus disclosed in Korean Patent No. 10-1129325 and their operational methods are also the same, and thus a detailed description thereof will be omitted.

[0039] However, of course, an apparatus having another known structure and another operational method can be employed as the automatic fire extinguisher 200.

[0040] Although the exemplary embodiment of the present invention has been described until now, the present invention is not limited to the above-described embodiment, but the scope of the present invention include the claims and various modifications thereof made by those skilled in the art to which the present invention pertains, without departing from the spirit of the present invention described in the claims.

Claims

1. A heater having an automatic fire extinguisher, the heater comprising:

a heater body including a fuel tank;
a wick elevation unit fixed to the heater body and having an outer container having an opened upper end and a hollow air tank installed to be spaced apart from an inner surface of the outer container and having an opening at an upper end thereof, for elevating a wick between the outer container and the air tank;
a combustion tank disposed at an upper end of the wick elevation unit;
a vent cap for opening and closing the opening at the upper end of the air tank,
a temperature detection unit installed on the bottom surface of the vent cap to face the hollow portion of the air tank and located on a side opposite to a side which flames face; and
an automatic fire extinguisher for receiving a signal from the temperature detection unit and lowering the wick.

2. The heater of claim 1, further comprising:

a support frame having a fixed plate spaced apart from a bottom surface of the vent cap, and support legs extending upwards from the fixed plate and fixed to the bottom surface of the vent cap,
wherein the temperature detection unit is fixedly installed on a bottom surface of the fixed plate.

3. The heater of claim 2, wherein the support legs are fixed to the vent cap by inserting upper ends of the support legs into vent holes formed in the vent cap and bending the support legs.

4. The heater of claim 3, wherein the vent cap has an upwardly convex shape, and the fixed plate protrudes downwards further from a lower end of the vent cap.

Fig.1

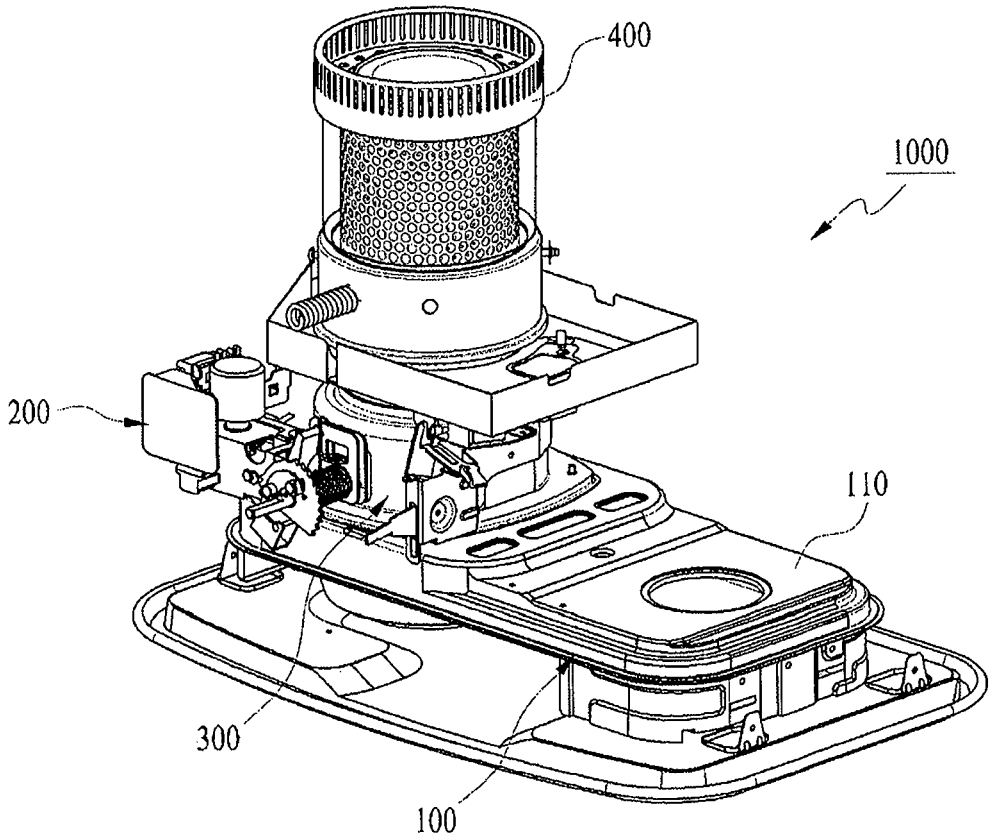


Fig. 2

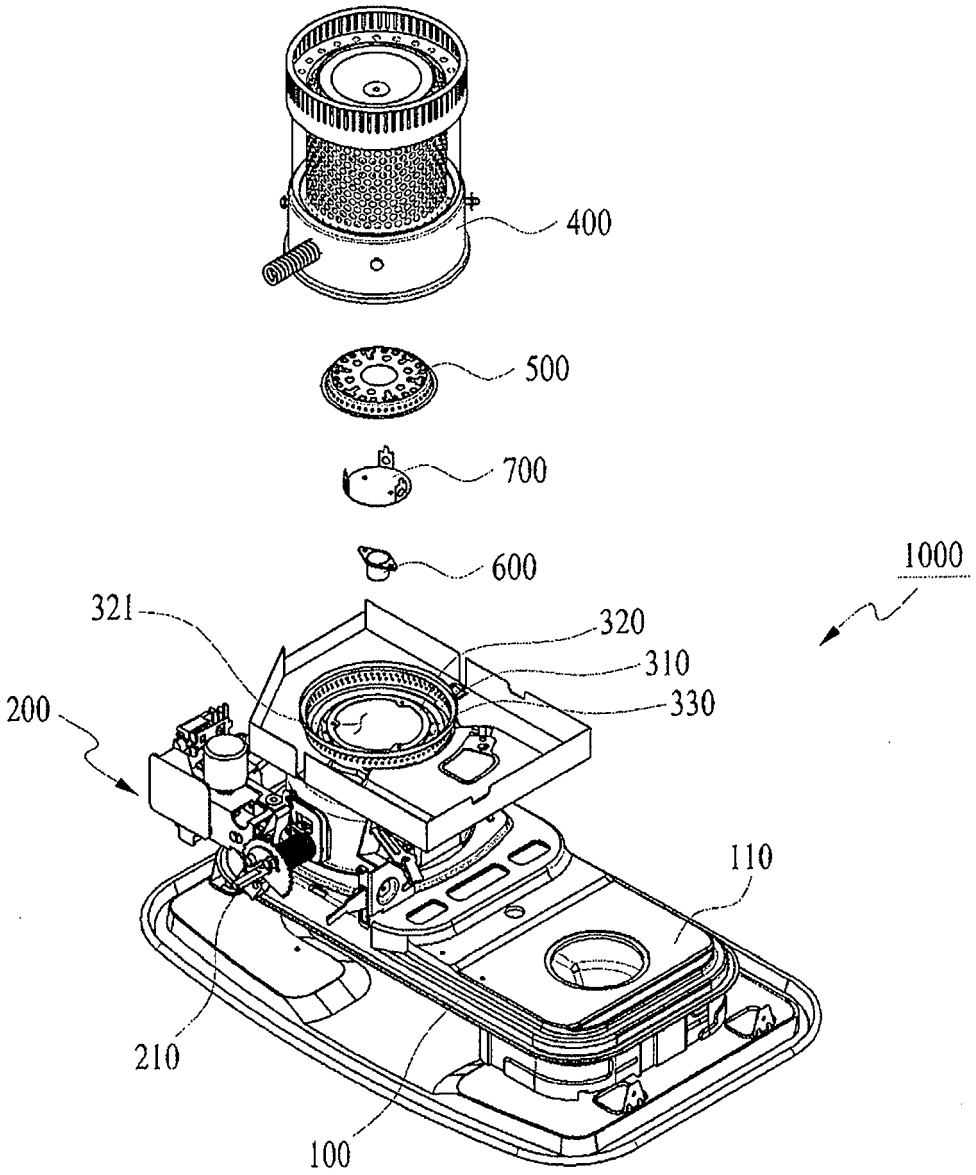


Fig. 3

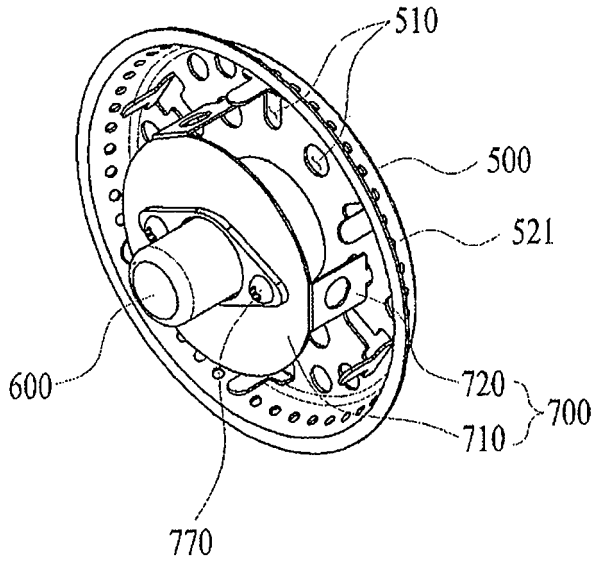


Fig. 4

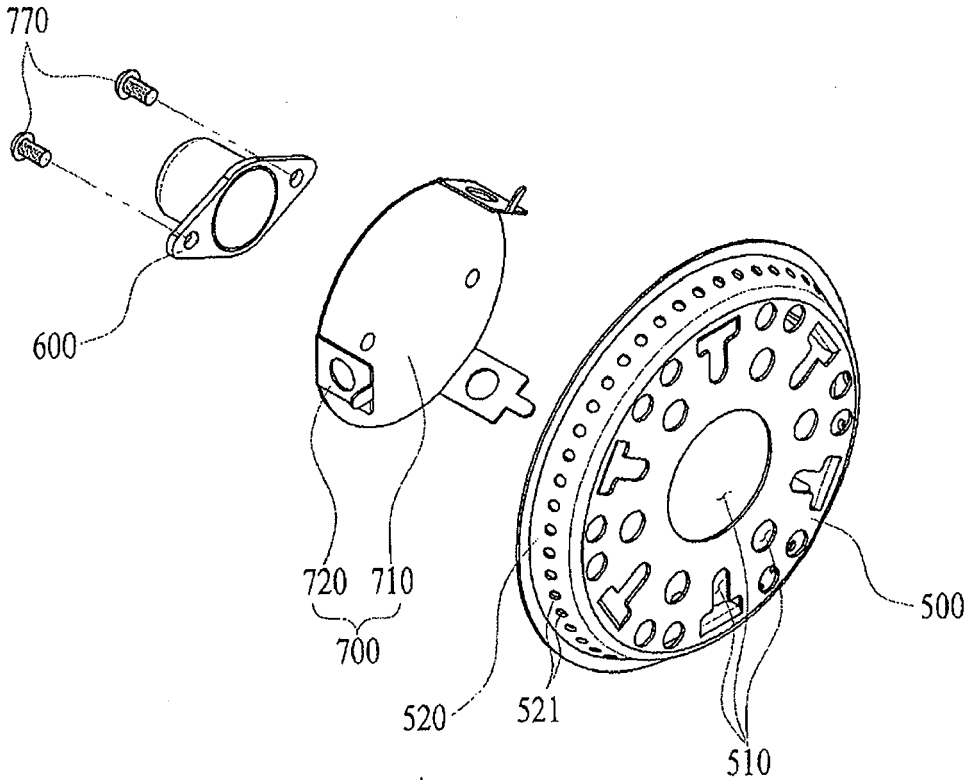


Fig. 5

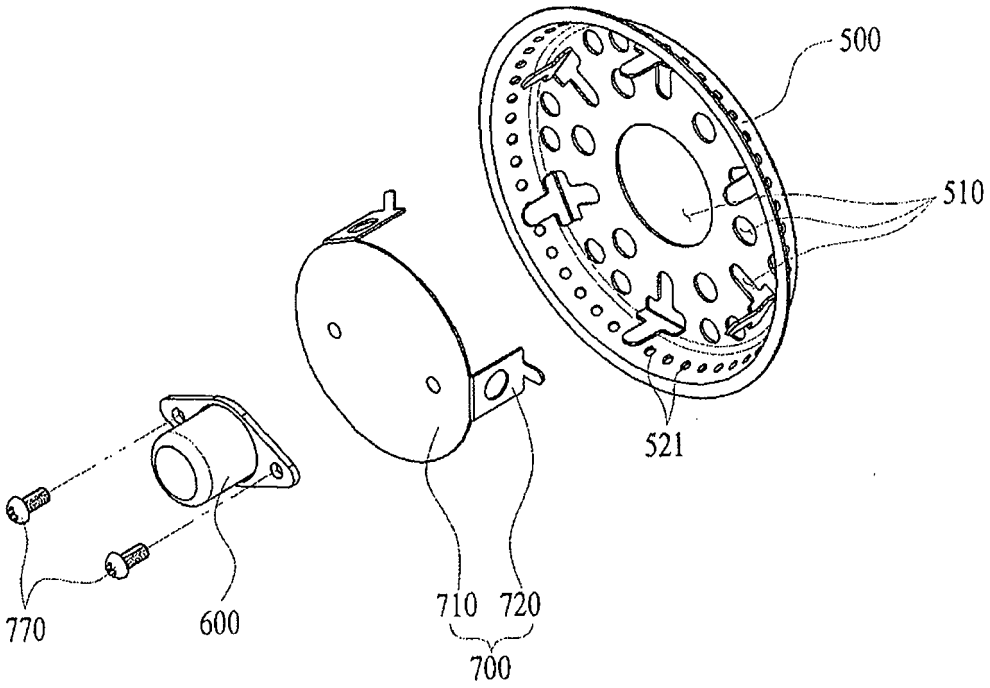
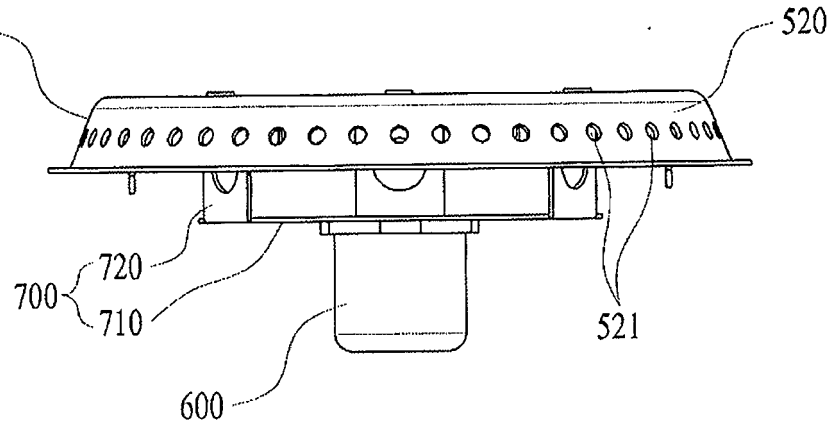


Fig. 6



Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 15 00 2299

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	EP 2 525 147 A2 (PASECO CO LTD [KR]) 21 November 2012 (2012-11-21) * paragraph [0020] - paragraph [0082]; claim 2; figures 1-6 *	1-4	INV. F23N5/00 F23N5/02 F23N5/24 F23D3/18 F23D3/28 F23D3/26
Y	US 4 175 436 A (CRAWFORD WILLIAM B [US] ET AL) 27 November 1979 (1979-11-27) * abstract; figures 1-2 *	1-4	
Y	EP 0 200 549 A2 (TOYOTOMI KOGYO CO LTD [JP]) 5 November 1986 (1986-11-05) * abstract; figures 1-7 *	1-4	
A	US 2010/259376 A1 (HONG SEONG-KOOK [KR]) 14 October 2010 (2010-10-14) * abstract *	1-4	
A	US 2012/315589 A1 (LEE SEUNGSOO [US]) 13 December 2012 (2012-12-13) * abstract *	1-4	

TECHNICAL FIELDS SEARCHED (IPC)

F23N
F23D
G08B
G01N

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	26 January 2016	Munteh, Louis

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 15 00 2299

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.

26-01-2016

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 2525147 A2	21-11-2012	CN 103518101 A	15-01-2014
		EP 2525147 A2	21-11-2012
		JP 5758047 B2	05-08-2015
		JP 2014517902 A	24-07-2014
		KR 101129325 B1	26-03-2012
		WO 2012157809 A1	22-11-2012
US 4175436 A	27-11-1979	CA 1115555 A	05-01-1982
		CH 642175 A5	30-03-1984
		DE 2928885 A1	13-03-1980
		FR 2435084 A1	28-03-1980
		GB 2029031 A	12-03-1980
		IT 1125417 B	14-05-1986
		JP S5531991 A	06-03-1980
		MX 149086 A	19-08-1983
		US 4175436 A	27-11-1979
EP 0200549 A2	05-11-1986	AT 84133 T	15-01-1993
		DE 3687363 D1	11-02-1993
		DE 3687363 T2	29-04-1993
		DK 197886 A	31-10-1986
		EP 0200549 A2	05-11-1986
		NO 861654 A	31-10-1986
		US 4797088 A	10-01-1989
US 2010259376 A1	14-10-2010	KR 100849941 B1	01-08-2008
		US 2010259376 A1	14-10-2010
		WO 2009134025 A2	05-11-2009
US 2012315589 A1	13-12-2012	KR 20120137084 A	20-12-2012
		US 2012315589 A1	13-12-2012

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- KR 101129325 **[0038]**