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## Combo hood Breeze function as dryer feature\_ID-05698

Paolo Markovina

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## Combo hood Breeze function as dryer feature\_ID-05698

### 1.Summary of the disclosure

The invention discloses a method of combo hood (the induction cooking hob integrated with down suction hood) inner cavity and filters drying after the cooking process for the scope to enable the air cleaning filters (grease and odors) regeneration for the next cooking cycle, without reduced filtering performances.

In particular, since that dry airflow prevents the molds and yeasts generation and growth, the concept predicts to ventilate and dry the appliance cavity, a built-in furniture, and a backwall close to appliance installation, for some time after cooking process ended, since that the same became wet through the cooking phase, when the appliance is installed without an exhausting piping system.

Accordingly, in order to reduce the condensed water load within the appliance cavity space itself and there installed air filtering elements (the odor filter in particular) the method comprises the use of combination an intensive (a “booster”) short duration room temperature airflow followed by one low intensive and long duration (a “breeze”) airflow, a both characterized by low humidity level, enable an effective post-cooking drying of the appliance cavity, filters, as well as the appropriate built-in furniture and noted backwall structure.

### 2. Applicable patent categorization

<u>F24C15/10</u>	Tops, e.g. hot plate, rings;
<u>F24F7/00</u>	Ventilation, e.g. by means of wall ducts; systems using windows or roof apertures;
<u>F24C15/20</u>	Removing cooking fumes;
<u>F24C15/00</u>	Details, arrangements for discharging combustion gases;
<u>F24C7/08</u>	Arrangement or mounting of control of safety device;

### 3.Technology domain

The present invention relates to the home appliance cooking induction hob with system for the central downward suction of cooking vapors, their treatment and exhausting, controlled by the software. More specifically, the invention relates to a hob integrated suction system functionality that performs the appliance inner structure drying effect, including the appropriate built-in mobile and near backwall drying to reduce molds and yeasts generation outcomes.

#### 4.References

1. DE102011018962A1; Cooking hob has cooking fume withdrawing device that is provided in the center area of cooking surface, such that cooking fumes are pulled downwardly in vertical direction of cooking hob  
Abstract

*The cooking hob has several cooking zones that are arranged in preset manner on a cooking surface. A device for withdrawing cooking fume is provided in the center area of cooking surface, such that cooking fumes are pulled downwardly in vertical direction of cooking hob. A recess is provided in the region provided around the device for withdrawing cooking fume.*

2. US2014048057AA; Hob with central removal of cooking vapours by suction-extraction in the downward direction  
Abstract

*A hob with one or more cooking locations, which, as viewed from above, exhibits one or more recesses only in the area around its geometric center, which are respectively connected with one or more devices for removing cooking vapors through suction, wherein these devices for removing cooking vapors through suction downwardly remove the cooking vapors that arise above the cooking locations by suction in a direction pointing vertically below the hob, and such a hob, which in the assembly unit is designed with a device for operating the hob and downwardly removing cooking vapors by suction.*

3. US2021063234AA; Cooktops with integration extraction hoods and scales  
Abstract

*A cooktop as claimed in the present invention comprises a main body having a top surface and a bottom surface; at least one cooking area configured to accommodate a heating element proximate to the top surface; a suction opening formed on the top surface; suction means in fluid communication with the suction opening and configured to draw in cooking fumes; a support member connected to the main body weight sensing means located between the support element and the main body for sensing the weight of objects to be weighed; the support element at least partially overlaps the suction means.*

#### 5.Problem to be solved

A combined and compact cooking appliance, obtained by integration of induction cooking hob and cooking fumes extraction module, is developed recently. The corresponding application has a more cooking surfaces and one suction hole onto worktop central area where the airflow is sucked, by short path, directly down into appliance cavity, where the grease and odor filters together with compact ventilator unit are positioned. The appliance operates without a specific vapors condensing solution.

Accordingly, the installed filters clean the air stream from oil and odors while the humidity condenses, partially onto all cavity inner surfaces including the filter structures (making them inefficient with time) and partially comes to be expelled out of the appliance cavity, into the appropriate built-in furniture or to be impinged directly onto backwall surface, placed behind the appliance itself.

In accordance, these effects create: the water condensation in the cavity weakening filters functionality effects and the appliance built-in furniture wetting and deterioration from the molds and yeasts, also generated on the backwall surface in case of exhaust humid air impingement onto same.

Moreover, the market trend tends to appreciate the appliance installation as much as possible agile, giving a higher value to the appliance installation without or with the shortest possible exhausting piping solution, when the water, condensed in the appliance cavity, hasn't a specific collecting space nor a drainage sewer connection.

## 6. Proposed solution

The invention discloses the method for the Combo appliance cavity post-cooking drying and drying effects of the built-in fitting furniture and appliance near backwall surface where the mix of suction air cooking wet vapors impinges the wall when the combo appliance is installed close the wall, without an exhausting piping system.

Accordingly, in order to perform the drying of the combo appliance cavity from the collected water, remained from the previous cooking process, the drying solution predicts that at some (anyhow short) time distance after the last cooking phase, the suitable software routine would switch-on the appliance's ventilator, in order to ensure the room temperature and relatively dry airflow through the cavity. Following the same, the software should firstly switch-on the ventilator unit at max. speed (the "booster" speed) for 20 sec. duration, afterwhile the ventilator should operate for 1 hour at minimal (the "breeze") and silent airflow speed.

Accordingly, the "booster" suction airflow should generate an intensive turbulence within the cavity, doing the extraction of water droplets from the appliance's cavity, and move the established layers of collected water from the inner corners and sharp borders onto areas of cavity where the successive the "breeze" airflow could perform their slow evaporation and by this an effective drying of the cavity with a appropriate functional structures (filters, ventilator and their supports). Duration of "breeze" air flow function should ensure an effective post-cooking drying of the appliance cavity and the dehumidification of the appliance built-in furniture and backwall impinging area, loaded by humidity through the wet air expelling through the cooking process.

## 7. Description

The home cooking appliance market in the last years showed a new trend through the combined appliance functionality, merging the induction cooking hob with cooking fumes extracting hood. In order to satisfy the marketing request for Combo cooking hob simple installation in the cooking room, it is predicted its the installation without venting (exhausting) piping solution.

Following the same, the appliance could be installed in the ductless recirculation way (Fig.1), to expel the sucked room air mixed with cooking process vapors (3) from cookware(2) directly onto back wall (10) behind the appliance through a very short exhaust pipe (7).

In accordance, the wet airflow, being sucked into the appliance cavity (8) and partially condensed within the same (becoming a less wet) comes to be cleaned at grease (a) and odor filter(b) and sucked by the ventilation unit (5) as tepid (4) airflow, after while the same airflow comes to be expelled (6).

Moreover, the appliance could be also installed into appropriate build-in furniture (Fig.2), where the sucked room airflow, mixed with collected cooking vapors(3) from the cooking process (2), being partially dehumidified and dried by its partial condensation within the cavity(8) is discharged through the short exhaust pipe(7), being successively expelled onto room floor surface in distributed manner.

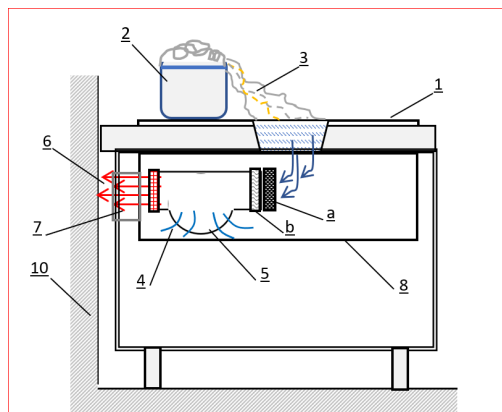


Fig. 1.: Combo hob a ductless recirculation solution.

Accordingly, following the concept of appliance installation without expelling (venting) piping system, the Combo hob appliance is installable for use also in a half-pipe (Fig.3) recirculation form, enabling in this way the discharge of the warm and wet airflow under the built-in mobile directly onto floor or parallel with the same.

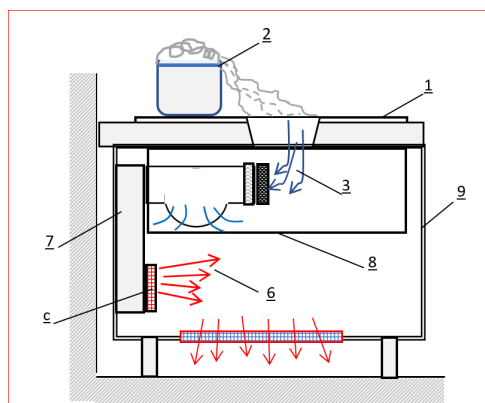


Fig. 2: The Combo hob with a built-in recirculation structure

In accordance with previous, all three listed Combo hob installation solutions, enable the fast appliance positioning for use, however, they generate also the conditions for the molds and yeasts grow, at the cooking room back wall exhausting area and within the built-in furniture space (9) in particular (with accelerated deterioration effects) with creation of unappreciated odors and hygienic issues.

Accordingly, it is known that dry air can prevent molds and yeasts generation and growth. Therefore, here is described the solution to integrate the special software routine and use case to apply Combo hood.

ventilation unit for the drying effect of the cavity (8), the built-in furniture (9), and back wall surface (10), after cooking phase finishing, without application of heating power.

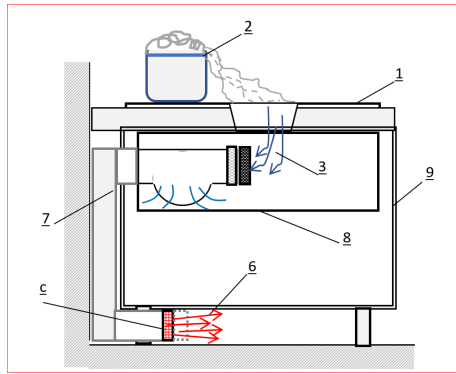


Fig. 3: The Combo hob with a half-piping recirculation (airflow expelling on the floor) solution.

and ventilation unit, as well for the built-in furniture and the back wall impinged surface, is to be performed, through the two steps. Accordingly, the ventilation unit (8) operation(only), for the post-cooking drying effect, of appliance's cavity with filters

The first step considers the ventilation unit short period operation (20 sec.) and high-speed level, by so called "booster" speed function. The second step, to be perform right after the first one, considers the ventilation unit long period operation(1h) at low speed (silent) level, by so called "breeze" function.

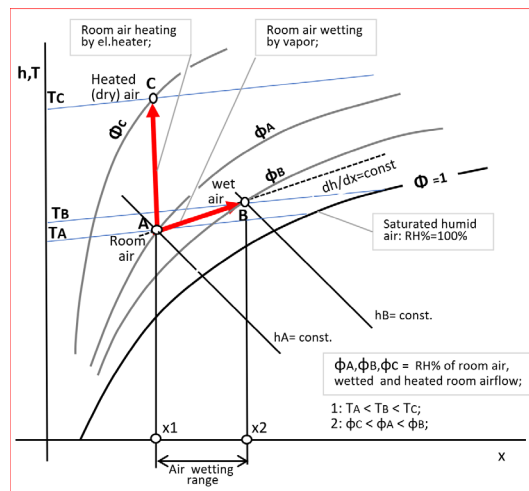


Fig. 4: Humid air hx-diagram with effects of: room airflow wetting by cooking process vapors and heating by el. heater, for drying effect enhancement.

Accordingly, the ventilation unit has three nominal working speeds, applicable through the cooking process fumes suction, while the "booster" and "breeze" functions are an intensive and a slow ventilator unit speed level, not applied for Combo hood cooking process support.

Moreover, it is to expect that the mayor part of the water collected in the cavity through the previous cooking process would be expelled and evaporate by the "booster" and "breeze" effects, enabling the dryness of cavity and inside placed functional structures (filters and their surfaces and supports) and ensuring the functionality of appliance for the next cooking process.

In particular, since that lower threshold of air temperature to destroy molds and yeasts should be 60°C, the applied heating power should be reasonable high. Following this, the heater could operate constantly or temporary, in function of the discharged airflow relative humidity level through the heating process.

Moreover, in order to obtain the specific heating efficiency, the airflow could be performed in an integral or partial form while the heater could be realized in a single or multipole stage. However, to reduce the negative effects of the expelled wet airflow (6) impact onto backwall and built-in appliance mobile, the wet air flow could be dried within the cavity (8) or at the terminal of exhausting pipe (7), as how shown at the Fig.2 and Fig.3, being heated at a determinate temperature (Fig.4) by the opposite electrical heater (c).

The el. heater, installed within the cavity space, however, could be placed in front of the grease (a) filter, making the odor filter regeneration more efficient, or behind the ventilation unit (5), enabling it's the efficient back wall drying (Fig.1) and an easier control and replacement.