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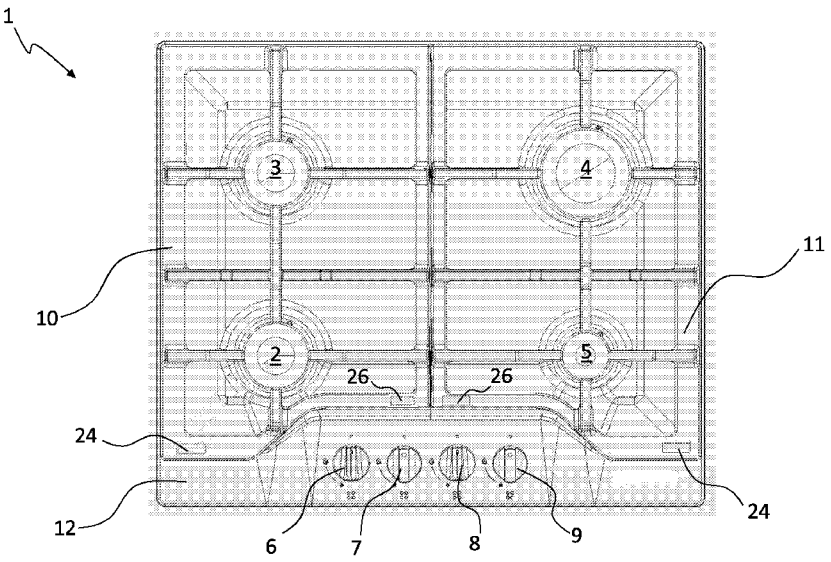


Fig. 1

(57) Abstract: The invention relates to a grate for supporting pots over burners of gas cooking ranges, cooking tops and similar household appliances. In order to avoid that a person might get burned while handling a hot grate, thermochromic elements are applied to the latter, which are activated when preset temperature values are reached. In this manner, the thermochromic elements provide an immediate indication about a possible risk of burns. The grate thus obtained can therefore operate as a safety device against household accidents.

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"Grate for cookers"

DESCRIPTION

The present invention relates to a grate for supporting pots over burners of cooking ranges, cooking tops, ovens and similar household cooking appliances.

As is known, a large number of household accidents are due to burns suffered by people who, due to carelessness, lack of attention or any other reason, touch inadvertently the pot supporting grates when they are still hot.

Indeed it is well known, that the grates, which are made of a metallic material (cast iron, steel or the like) that is heated by the flame under the pots while food is being cooked, can reach high temperatures, even hundreds of degrees.

The thermal capacity of the grates, which is related to the metal they are made of, is rather high: therefore, it may take some minutes for the grates to cool down and return to ambient temperature.

It is self evident that if a person grabs the grates during that time interval, e.g. in order to

move them for cleaning the burners or the grates themselves, he/she will risk to get burned.

It should also be observed that the temperature of the grates is usually uneven, i.e. it may be higher in some places and lower elsewhere; for example, this is the case wherein a grate is associated with two or more burners of a cooking top, and only one of them has been lighted on under a pot.

It is apparent that in such a situation there will be an uneven temperature distribution, with hotter points and cooler points at a temperature equal to or only slightly higher than ambient temperature.

This situation is dangerous because, if someone touches the grate at a point at ambient temperature, he/she will think that the grate can be grabbed safely in other places as well, which may however be very hot, thereby resulting in the risk of burns and scalds.

The present invention aims at improving this state of the art: therefore it is an object thereof to provide a grate for supporting pots over burners of cooking ranges, cooking tops and similar household cooking appliances, having such

structural and functional features as to prevent, or at least reduce, the risk of accidents due to burns.

The idea underlying the present invention is to associate temperature indicator means with the grate, so that a user can immediately know the temperature conditions of the same.

Preferably, the indicator means comprise thermochromic elements having a preset activation temperature, so as to provide an immediate indication of the thermal conditions of the points of the grate where they have been applied.

The features of the invention are specifically set out in the claims appended to this description. They will become more apparent in the light of the following description of a preferred but non-limiting embodiment, provided herein after with reference to the annexed drawings, wherein:

- Fig. 1 is an elevation view of a cooking top incorporating a grate according to the invention;
- Fig. 2 is an axonometric view of a part of the cooking top of Fig. 1;
- Fig. 3 shows a detail of the cooking top of the preceding figures.

With reference to the above-listed drawings, reference numeral 1 designates as a whole a cooking top according to the invention, which in this case is a separate device to be inserted into the cabinet of a household kitchen (not shown in the drawings).

The cooking top may however be a part of a cooking appliance on its own including an oven, or it may be designed in any manner appropriate for the intended use.

As can be seen, the cooking top is equipped with four gas burners 2, 3, 4 and 5, controlled by respective knobs 6, 7, 8 and 9; there are also two grates 10, 11 for supporting pots over it, laid on a base 12 of the cooking top 1.

The grates 10, 11 are made of metallic material, preferably cast iron or steel, and are optionally coated with an enamel layer; the base 12 is also made of metallic material, typically stainless or enameled sheet metal, as commonly known in the art.

At predetermined points of the grates 10, 11 there are seats 14, 15, 16, essentially consisting of surface hollows; the seats 14, 15 and 16, visible

in Fig. 2, may be arranged (as is the case of the seats 14, 16 in Fig. 2) on the flat portions 10a, 11a of the grates, like those in contact with the base 12 of the cooking top, and (as is the case of the seat 15 in Fig. 2) on the raised portions 10b, 11b, whereon pots are laid.

The number and arrangement of the seats may vary from case to case as a function of various parameters, such as the shape and dimensions of the grates, the number of burners, the height of the burners from the base of the cooking top, and more.

The seats 14-16 house respective thermochromic elements 24, 25, 26; the latter are not shown in Fig. 2 to highlight their respective seats; in a preferred embodiment, the thermochromic elements 24-26 are substantially configured as adhesive labels applied into respective seats.

Thermochromic materials have the peculiarity of changing color depending on the temperature to which they are exposed; they are composed of colored pigments that may be organic, such as anil, spiropyrane, polyvinyl acetate resin, and hydroxides, or inorganic, based on AgI, Ag2HgI4,

HgI, HgI2, SrTiO3, often bound to cobalt or copper.

These pigments are used for making inks, thin films or even solid compounds, generally ceramic or fibrous ones.

The change in color may be either reversible or irreversible, depending on the pigment in use; thermochromic materials may be semiconductors, liquid crystals, fibrous, ceramic or of the metal matrix type.

One example of reversible transformation is given by pigments that expand and become transparent at a certain temperature; if they are laid on a colored surface, at that certain temperature the color of the surface will become visible. Some examples of molecules that change their configuration depending on their exposition to temperature, UV rays or both are 'violet lactone' and 'spiroxazine'.

Of course, thermochromic materials can be applied in various forms to the grates 10, 11; for example, by subjecting the seats 14, 15 and 16 to silk-screening, painting or enameling processes; also, the characteristics of thermochromic

materials can be associated with those of the substrate onto which they are applied, thus providing further information.

Thus, there may be applications wherein the activation of the thermochromic material when the transition temperature is reached will make information, such as words, symbols or numbers, visible to the user, so that the latter will be warned about the temperature-related danger.

This is the case wherein, when the activation temperature is exceeded, the thermochromic material will change color, becoming red and/or causing indications to appear, such as "hot", "danger" or the activation temperature values corresponding to the temperature of the grate (e.g. 80 °C or 100 °C, etc.).

Note that, in this description and in the following claims, what is defined as a change in color of the thermochromic material also refers to the case wherein it becomes transparent when the activation temperature is exceeded.

It is clear that in this circumstance the substrate on which the material has been applied, be it a sheet of paper or plastic, or the bottom

of the seat 14, 15, 16 associated therewith, may be so coloured that the thermal activation of the material will cause the color, preferably red, or the sign, word, number, etc., as previously discussed, to appear.

As aforesaid, the number of seats 14, 15 and 16, and hence the number of thermochromic elements 24, 25 and 26, may vary depending on various parameters, such as the shape and/or the dimensions of the grates, and the like.

What is important, however, is the fact that they must allow a person to become easily acquainted with the temperature conditions of the grate, and hence with the danger it will pose if grabbed.

It follows that any solution useful for this purpose can be adopted.

It can be easily understood from the above description that the grate considered herein achieves the initial object of the invention.

In fact, the thermochromic elements 24, 25, 26 arranged at various points of the grate 11 provide an immediate and easy-to-understand indication about the temperature of the grate itself.

It follows that the risk that a person might grab

the grate while it is still hot without taking any precautions will be practically eliminated, de facto resulting in improved household accident prevention.

It must be pointed out that, since the thermochromic elements 24-26 are arranged at various points of the grate, they will provide different indications if the temperature of the grate at those respective points is different.

This improves safety because a person will always know which points are hot, so as to avoid touching them in the event that he/she must nevertheless grab the grate.

Of course, the invention may be subject to variations with respect to the description provided so far.

It is in fact clear that the thermochromic elements can be applied to grates having configurations other than the one shown in the drawings, such as, for example, grates made from metal wire, like oven and grill grids, and the like.

It must also be pointed out that the seats 14, 15 and 16 are a preferred feature of the invention,

in that they provide optimal contact between the respective thermochromic element housed therein and the grate; furthermore, the thermochromic element housed in the seat is protected against shocks or other external agents (e.g. wash water, grease), which might otherwise damage it.

However, said seats may in some cases be omitted; for instance, let us consider the case wherein, due to the shape or dimensions of the grates, e.g. grates made from metal wire, the elements 24, 25, 26 are glued or provided as adhesive labels, or applied to metal plates welded to the grate metal. Thermochromic materials may then be provided as deemed appropriate, e.g. as a film or a plate, or as materials applied to the respective substrate (which may be metallic, synthetic or of any other nature) by painting, enameling and the like. What matters is, however, that the thermochromic elements 24,25, 26 are activated when a temperature threshold value is exceeded (e.g. 80°C), and preferably remain active above that value.

In other words, it can be stated that, in accordance with the invention, one characteristic

of the thermochromic elements for this application is that they stay active for a wide preset temperature range above a preset transition value. All of these variants will still fall within the scope of the following claims.

CLAIMS

1. Grate for supporting pots over burners (2, 3, 4, 5) of cooking ranges, cooking tops and other similar household cooking appliances, characterized in that it comprises at least one thermochromic element (24, 25, 26) applied thereto.

2. Grate according to claim 1, comprising at least one lowered seat (14, 15, 16) in which the thermochromic element (24, 25, 26) is housed.

3. Grate according to claim 1 or 2, comprising resting portions (10a, 11a) for resting on a cooking top (12) and raised portions (11b, 12b) for supporting pots, whereto the thermochromic elements (24, 25, 26) are applied.

4. Grate according to any one of the preceding claims, wherein when the activation temperature is exceeded the thermochromic elements become red in color.

5. Grate according to any one of the preceding claims, wherein when the activation temperature is exceeded the thermochromic elements highlight a warning sign, such as a word, a number or the like.

6. Grate according to any one of the preceding claims, wherein the thermochromic elements (24, 25, 26) stay active at temperatures higher than a preset threshold value.

7. Grate according to claim 6, wherein the preset threshold value is at least 70°C.

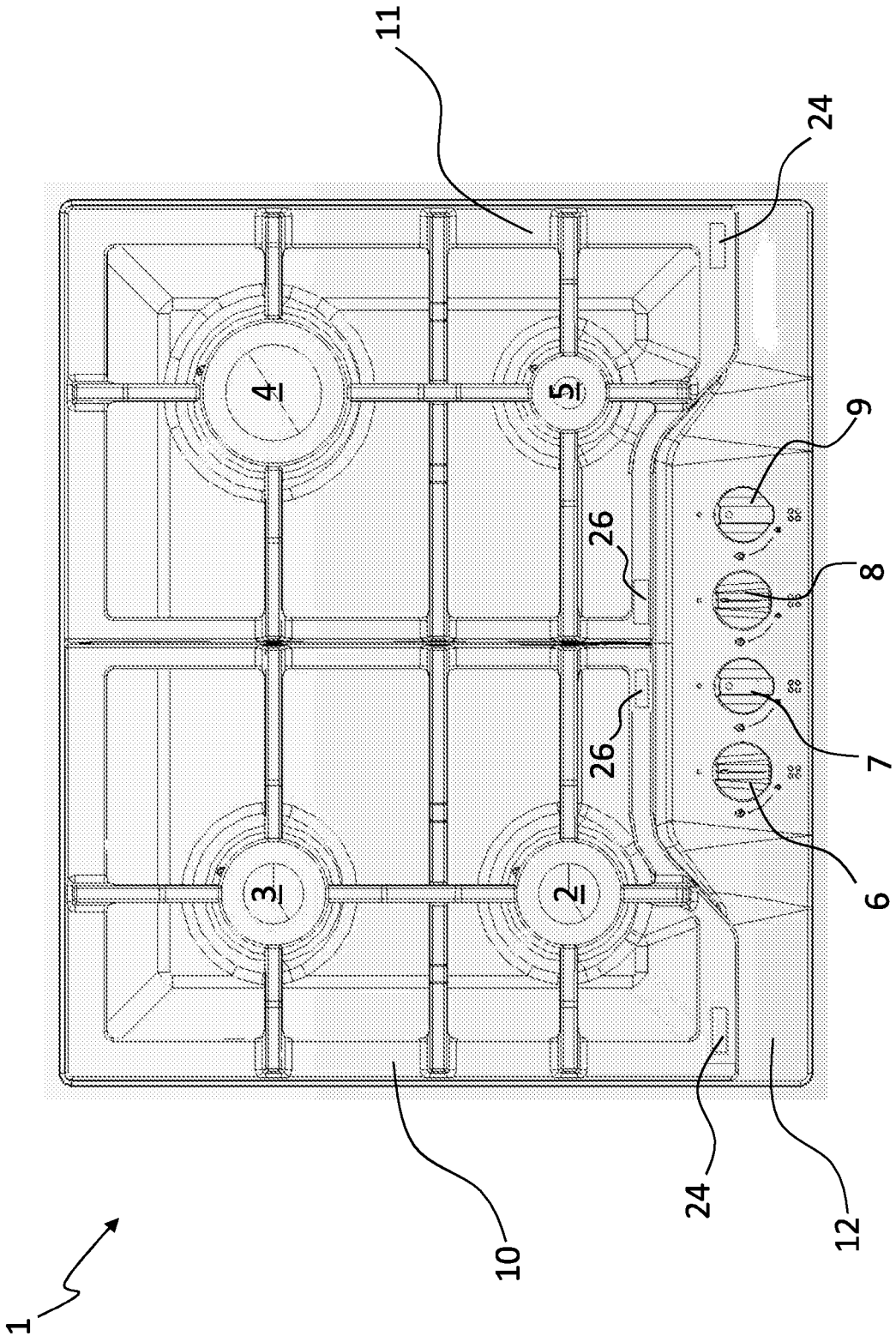


Fig. 1

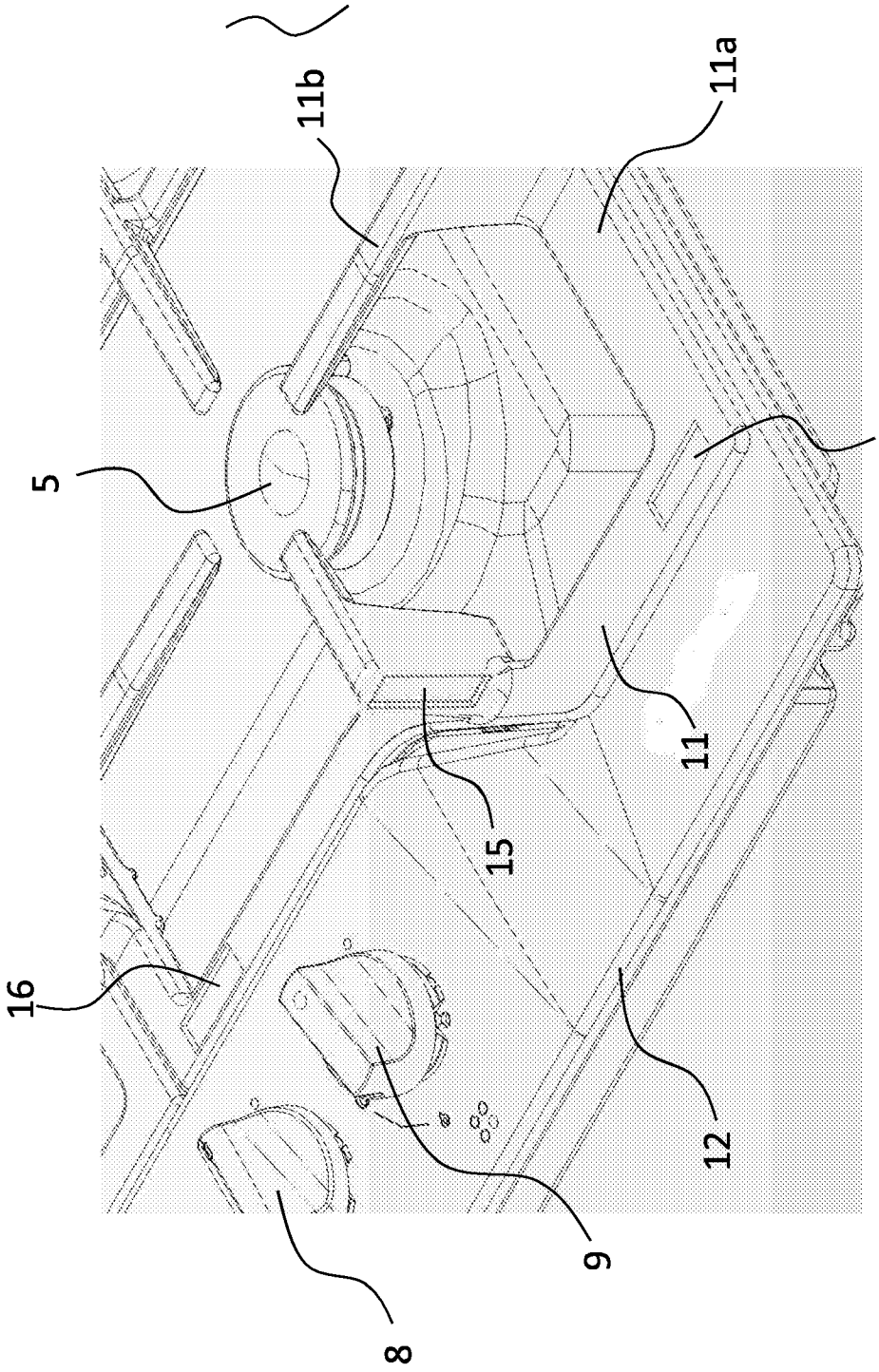


Fig. 2

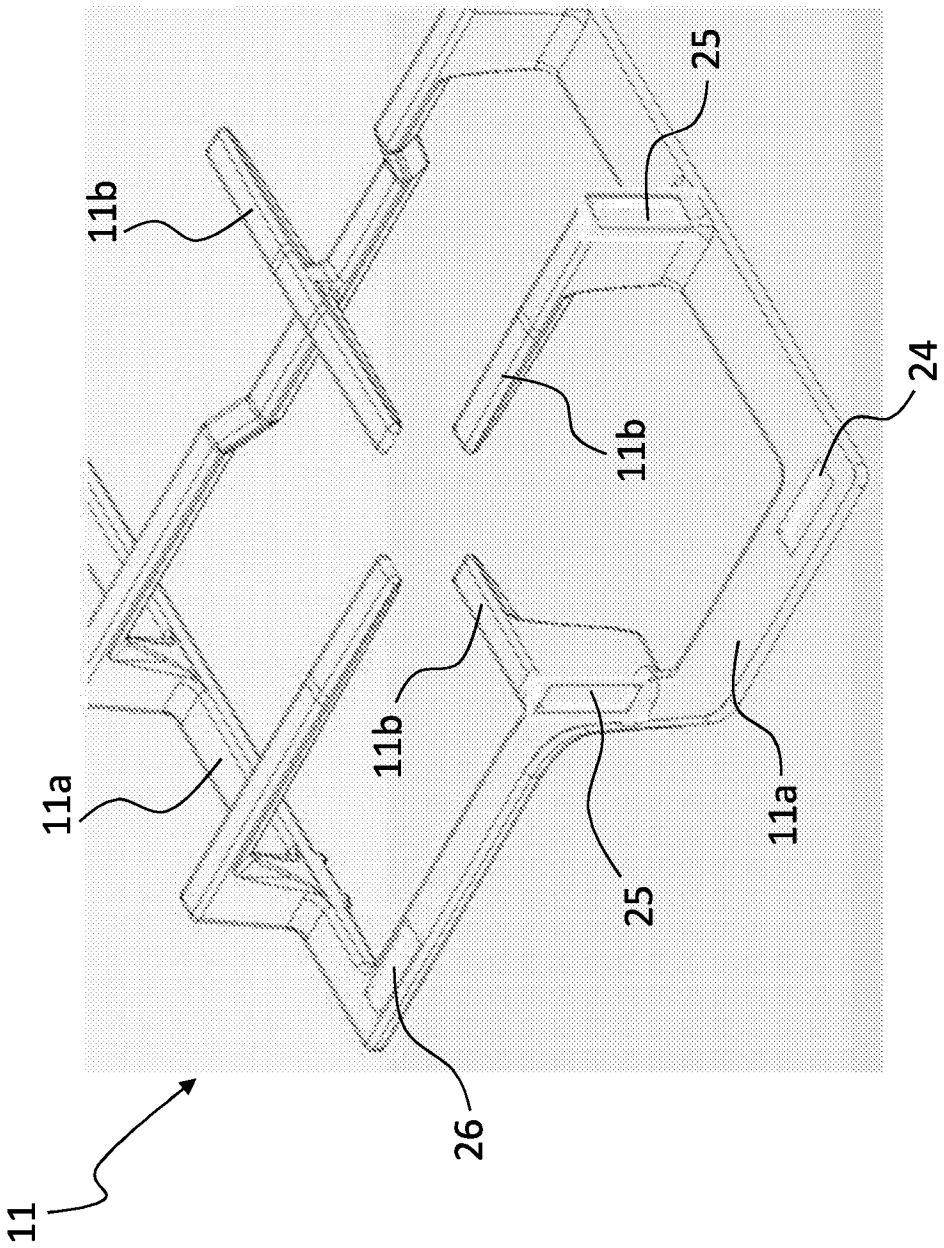


Fig. 3