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Pianezze(10) **Pub. No.: US 2009/0098495 A1**(43) **Pub. Date: Apr. 16, 2009**(54) **DEVICE FOR LIGHTING BURNERS IN A
HOUSEHOLD APPLIANCE, IN PARTICULAR
A COOKING OR BARBECUE RANGE****Publication Classification**(51) **Int. Cl.**
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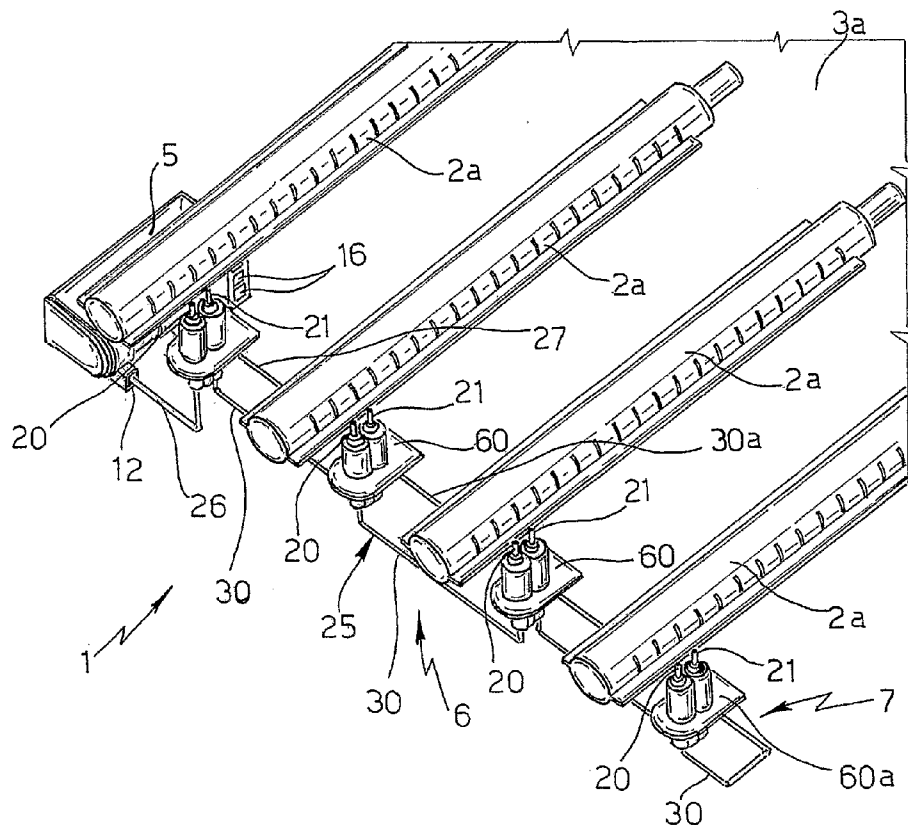
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1700 DIAGONAL ROAD, SUITE 300
ALEXANDRIA, VA 22314 (US)**(57) **ABSTRACT**

A device including high voltage generating means accommodated in an electrical insulating casing, spark generating means adapted to be arranged near respective burners of a household appliance to be ignited and electrical connection means between the high voltage generating means and the spark generating means; the high voltage generating means include a single secondary winding of a transformer provided with a single high voltage output contact and a single return contact, connectable to ground; the spark generating means include for each burner a pair of electrodes reciprocally insulated and arranged side-by-side at a predetermined distance such that to allow in use the generation of sparks between the same; the electrical connection means include a single electrical wire connected to a single output of the high voltage generating means connecting in series together all the existing electrode pairs and divided by the electrodes of each pair of a plurality of segments reciprocally and electrically insulated by means of the electrodes of each electrode pair, to form a chain of electrodes coupled two-by-two.

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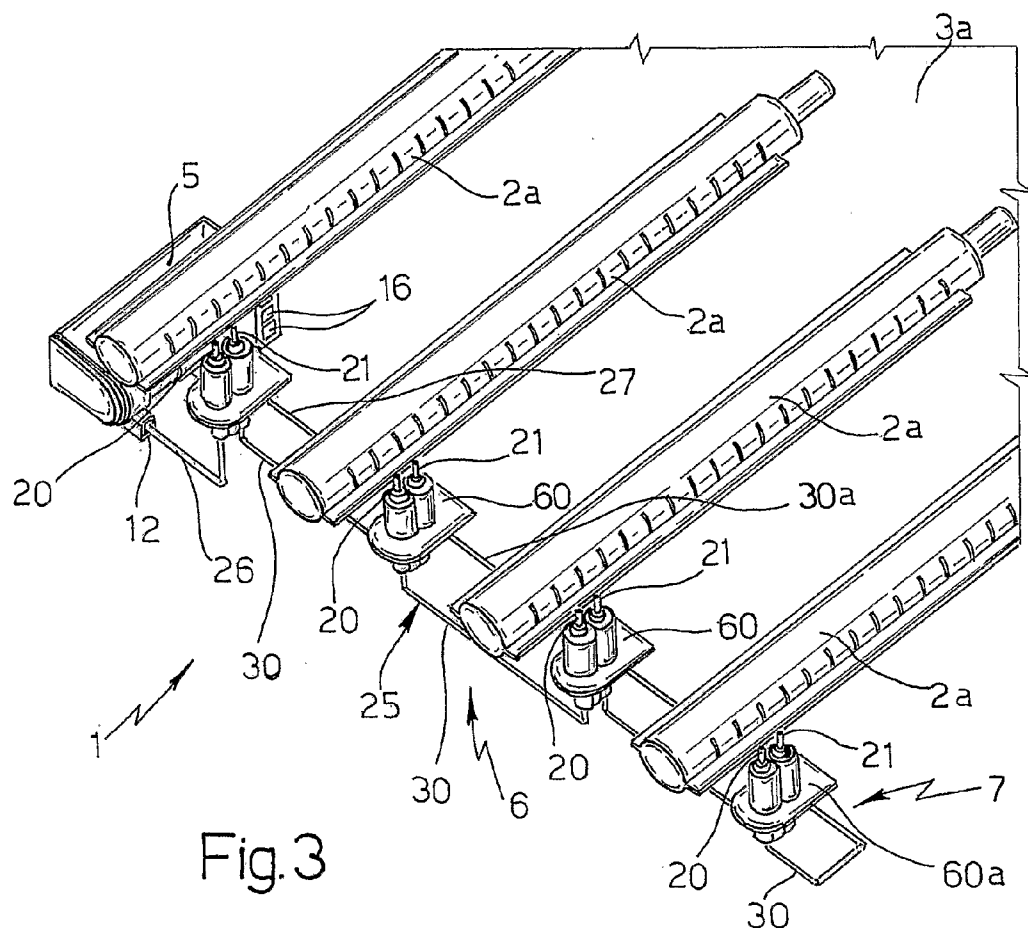


Fig. 3

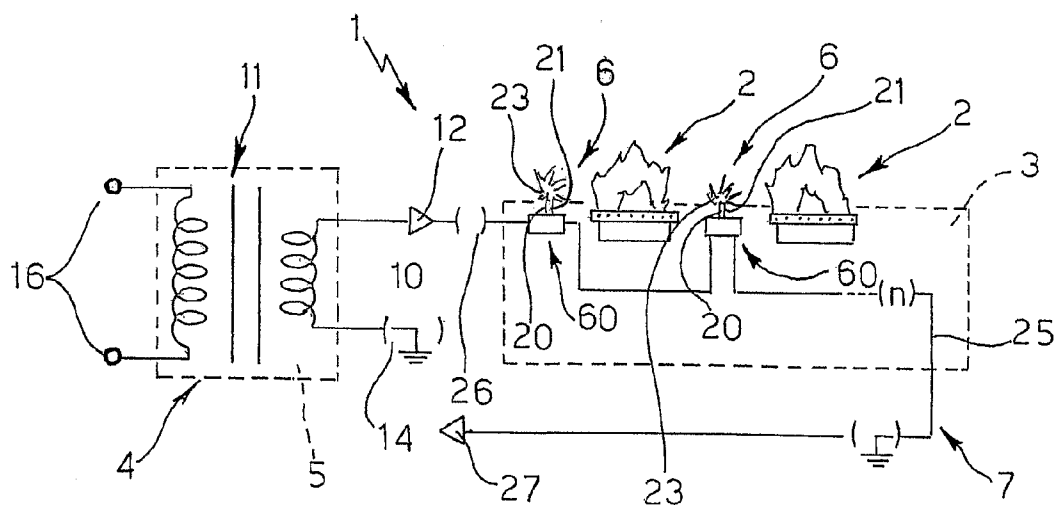
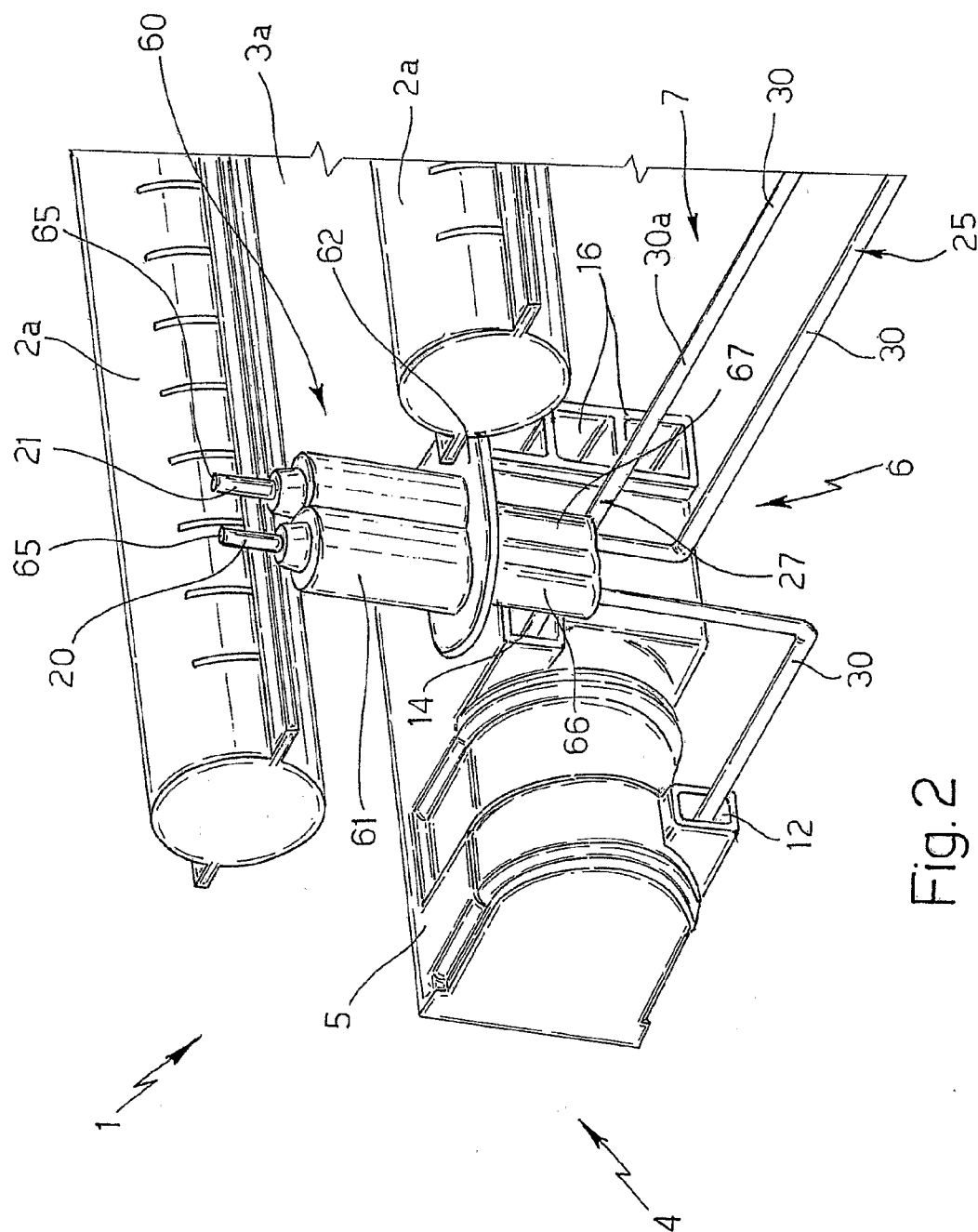


Fig. 1



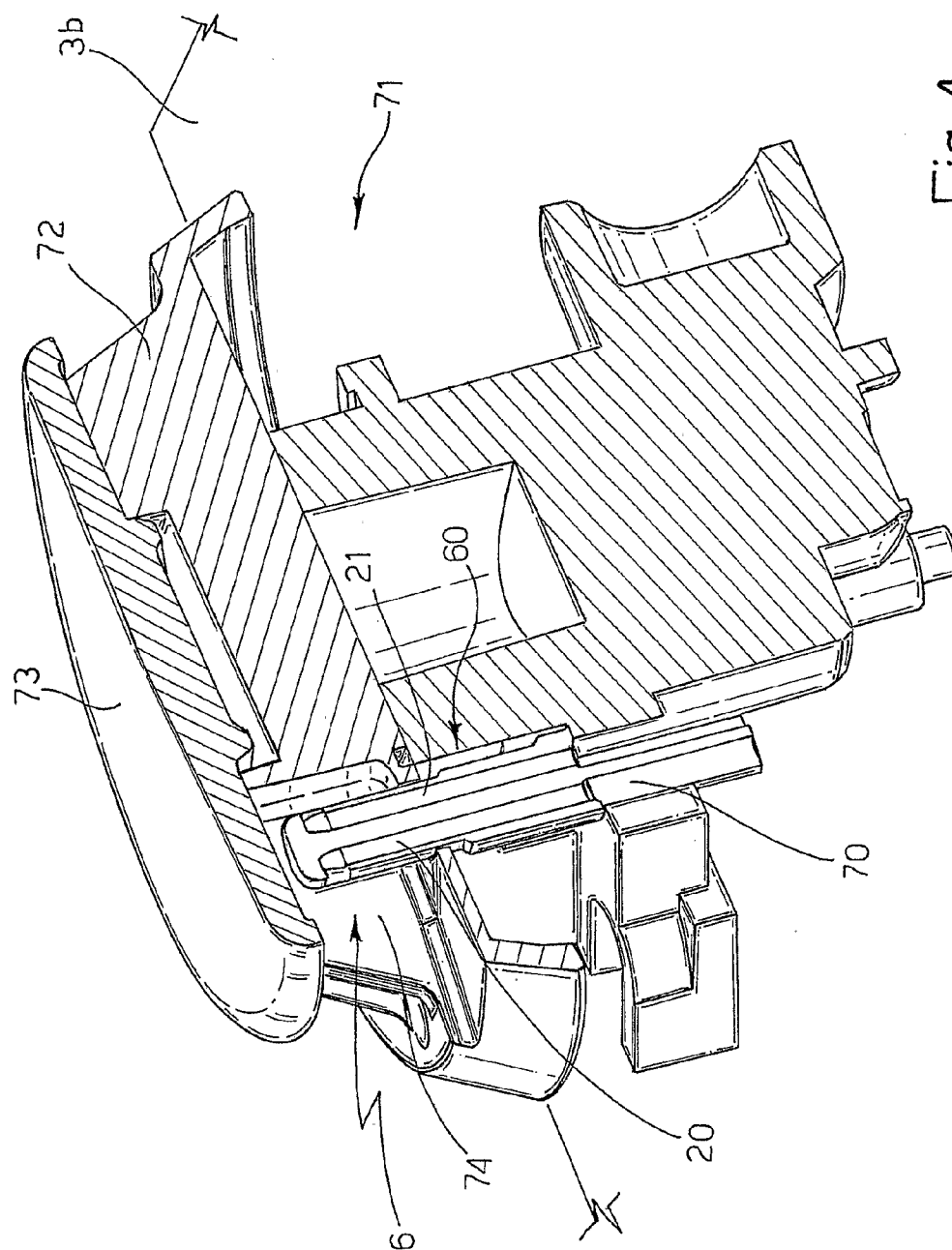


Fig. 4

**DEVICE FOR LIGHTING BURNERS IN A
HOUSEHOLD APPLIANCE, IN PARTICULAR
A COOKING OR BARBECUE RANGE**

TECHNICAL FIELD

[0001] The present invention relates to a lighting device particularly suitable for cost-effectively and simply lighting a plurality of burners in a household appliance, in particular consisting of a multiple burner cooking or barbecue range.

BACKGROUND ART

[0002] It is known that nowadays household appliances provided with burners fed by a combustible gas (e.g. cooking ranges, barbecue ranges, gas ovens, etc.) are all essentially equipped with either manually or automatically controlled electronic ignition devices, preferably operating on each existing burner.

[0003] The known ignition devices consist in a casing containing high voltage generating means based on one or more transformer spools including a plurality of secondary (high voltage) windings, each of which presents an output contact connected to an ignition electrode positioned in proximity of a corresponding burner; in use, the secondary windings apply voltage to the electrodes, which close the high voltage circuit with the metallic structure of the burners, which is connected to ground by means of the cooking range (generally formed by conducting material) thus generating sparks between electrodes and burners which produce the ignition of the combustible gas in the meantime fed to the burners, e.g. by means of valves or solenoid valves.

[0004] The traditional ignition devices of the described type present the double drawback of being relatively costly, complex and cumbersome, due to the numerous electrical power wires needed to connect the electrodes to the corresponding outputs (output contacts) of the high voltage generating means; and of being needed to be designed according to the number of burners to be ignited; therefore a device having the casing with high voltage generating means provided for igniting, e.g., three burners cannot be used to ignite a higher number of burners, while, if a lower number of burners needs to be ignited, the unused output(s) must be somehow neutralised, e.g. by means of a direct connection to ground.

DISCLOSURE OF INVENTION

[0005] It is the object of the present invention to solve the aforesaid drawbacks by providing a very simple, low cost and small size ignition device, which is capable of simply igniting a plurality of burners, present in variable number within a predetermined range, so as to be adapted to serve different models of cooking/barbecue ranges, having a different number of burners to ignite, essentially without changing any of the basic structure of the device itself and above all of the high voltage generating means.

[0006] The present invention thus relates to a device for igniting the burners of a household appliance, in particular a cooking or barbecue range, as defined in claim 1.

[0007] In particular, the ignition device according to the invention comprises high voltage generating means consisting of a single secondary winding of a transformer provided with a single high voltage output contact and a single return contact, connectable to ground; and spark generating means including, for each burner to be ignited, a pair of electrodes

reciprocally and electrically insulated and reciprocally arranged side-by-side at a predetermined distance such that to allow the generation of sparks in use between the electrodes of the electrode pair.

[0008] Finally, the device according to the invention comprises electrical connection means between the high voltage generating means and the spark generating means including a single electrical wire, a first end of which is connectable to the single output connector of the high voltage generating means and a second end of which is connectable to ground; such single electrical wire connects together in series all of the existing electrode pairs and is subdivided by the electrodes of each electrode pair into a plurality of segments reciprocally and electrically insulated by the electrodes of each electrode pair, to form a chain of electrodes paired two-by-two.

[0009] Furthermore, the single secondary winding is dimensioned so as to be adapted to generate a sufficient voltage to produce the generation of sparks between the electrodes of each pair of electrodes for a predetermined number of pairs of electrodes and equal to the maximum number of burners applicable to the household appliance.

[0010] In this manner, the same device again using the same high voltage generating means, having an appropriately dimensioned secondary winding, may be used to ignite any number of burners, i.e. at least in the entire possible range of a same household appliance, simply by connecting it to an appropriate number of electrode pairs in series by means of segments of electrical wire.

[0011] According to an aspect of the invention, such electrode pairs arranged side-by-side form ignition assemblies, each of which includes an electrically insulating body provided with fastening means to the household appliance; one pair of electrodes carried and accommodated in the electrically insulating body except for respective bare ends protrudingly carried side by side by the insulating body; and a pair of contacts, each connected to a respective electrode.

[0012] The contacts of each ignition assembly are then in use connected by means of the mentioned wire segments in series together, in particular a first contact is connected in series to a corresponding opposite contact of an immediately preceding ignition assembly, e.g. closer to the high voltage generating means, and a second contact is connected in series to a corresponding opposite contact of an immediately following ignition assembly, for example farther from the high voltage generating means; on the other hand, the first contact of the ignition assembly closer to the high voltage generating means will be connected to the single output contact of the high voltage generating means, while the ignition assembly farther from the latter will have its second contact connected, by means of a terminal segment of the single electrical wire, to the return contact of the high voltage generating means.

[0013] In the case of gas cooking burners, each ignition assembly consists of a ceramic spark plug carrying at least partially and internally embedded the electrodes of each electrode pair arranged side-by-side.

[0014] In this case, the invention further extends to a burner for a household appliance comprising a gas ring and a ceramic plate arranged in use over the gas ring, wherein the gas ring presents a radial recess open towards the plate and accommodating the ceramic spark plug, arranged with the pair of electrodes essentially perpendicular to the plate and in a more internal radial position within the radial recess, so that the ignition assembly is in use covered by the plate.

[0015] In this manner, the electrical connections to be made are hugely simplified, making the assembly of the device of the invention more rapid and cost-effective and the dimensions are likewise reduced. Furthermore, the burner provided with an ignition assembly consisting of a double electrode spark plug is of particularly appealing appearance.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] Further features and advantages of the present invention will be apparent from the following description of two non-limitative embodiments thereof, made with reference to the accompanying drawings, in which:

[0017] FIG. 1 diagrammatically shows the layout diagram of an ignition device made according to the invention;

[0018] FIGS. 2 and 3 respectively show an enlarged detail and a complete layout of an ignition device according to the invention for the burners of a barbecue range, shown in perspective view; and

[0019] FIG. 4 diagrammatically depicts an enlarged detail of a component of the ignition device in FIG. 1 in the case of a cooking range burner.

BEST MODE FOR CARRYING OUT THE INVENTION

[0020] With specific reference to FIGS. 1 and 2, numeral 1 indicates as a whole a device 1 for lighting burners 2, in particular longitudinal burners 2a, in a household appliance 3, in particular a barbecue range 3a shown only in part for the sake of simplicity.

[0021] Device 1 comprises high voltage generating means 4 accommodated within an electrically insulating casing 5, spark generating means 6 adapted to be arranged near respective burners 2 to be ignited of the household appliance 3 and electrical connection means 7 between high voltage generating means 4 and spark generating means 6.

[0022] With specific reference to FIG. 1 and to the non-limitative embodiment in FIGS. 2 and 3, high voltage generating means 4 comprise one single secondary winding 10 of a transformer 11 provided with a single high voltage output contact 12 and a single return contact 14, connectable to ground. In practice, these components, along with the necessary electronic supply board, of the known type, are accommodated inside casing 5, which defines an electronic ignition device of the traditional type, except for the fact that it indeed presents a single high voltage output contact 12, instead of a plurality of contacts 12, one for each burner 2 to be ignited, as in the traditional electronic ignition devices; further contacts 16 carried by casing 5 allow the electrical connection of device 1 to a power source, e.g. the electrical network.

[0023] According to the main aspect of the invention, spark generating means 6 comprise, for each burner 2 to be ignited, a pair of electrodes 20,21 reciprocally and electrically insulated and reciprocally arranged side-by-side at a predetermined distance to each other such that to allow the generation of sparks 23 (FIG. 1) in use between electrodes 20,21 of each existing electrode pair; while electrical connection means 7 include a single electrical wire 25, a first end 26 of which is connectable to single output contact or connector 12 of high voltage generating means 4 and a second end 27 of which is connectable to ground, i.e. to return contact or connector 21.

[0024] Therefore, single electrical wire 25 connects together in series all existing electrode pairs 20,21 and is subdivided by electrodes 20,21 themselves of each existing

electrode pair 20,21 into a plurality of segments 30 reciprocally and electrically insulated by electrodes 20,21 of each electrode pair, to form a chain of electrodes paired two-by-two, like in the case, for example, of the known light chains.

[0025] Single secondary winding 10 is dimensioned so as to be adapted to generate a sufficient voltage to produce sparks 23 between electrodes 20,21 of each electrode pair for a predetermined number of electrode pairs, in the case in point equal to the maximum number of burners 2 applicable to/provided for household appliance 3; for example, in the case of barbecue range 3a, if the provided models comprise a variable number of burners 2a between a minimum and a maximum (there are four burners in the case shown), winding 10 will be dimensioned to serve the maximum number of burners 2a which may exist.

[0026] For assembly simplicity, spark generating means 6 made according to the invention in addition to comprising a pair of electrodes 20,21 for each burner 2, are organised in a plurality of ignition assemblies 60, each of which (FIG. 2) includes an electrically insulating body 61 provided with fastening means 62 to household appliance 3 and a pair of electrodes 20,21 carried by and accommodated in electrically insulating body 61 except for respective bare ends 65 protrudingly carried side by the side by insulating body 61; finally, each assembly 60 comprises a pair of contacts 66,67, each connected to a respective electrode 20,21 and connected in series to respective corresponding contacts 66,67 of the other existing ignition assemblies 60 by means of segments 30 of single electrical wire 25.

[0027] Ignition assembly 60a arranged farther from high voltage generating means 4 (FIG. 3) presents a first contact 66 connected in series to a corresponding opposite contact 67 of an ignition assembly immediately closer to high voltage generating means 4 and a second contact 67 connected, by means of a terminal segment 30a of single electrical wire 25 to return contact 14 of high voltage generating means 4.

[0028] Therefore, as illustrated and described hereto, contacts 66,67 of each ignition assembly 60 are in use connected by means of the mentioned wire segments 30 reciprocally in series, in particular a first contact 66 of each assembly 60 is connected in series to a corresponding opposite contact 67 of an immediately preceding ignition assembly 60, e.g. closer to high voltage generating means 4, and a second contact 67 is connected in series to a corresponding opposite contact 66 of an immediately following ignition assembly 60, for example farther from high voltage generating means 4.

[0029] First contact 66 of ignition assembly 60 closer to high voltage generating means 4 will, on the other hand, be connected to single output contact 12, while, as previously described, ignition assembly 60a will have its second contact 67 connected by means of terminal segment 30a to return contact 14, either directly as in the example in FIGS. 2 and 3, or by means of the cooking range itself, i.e. through the ground connection, in the case of a gas cooking range 3b (FIG. 4), which is formed by metal.

[0030] With reference to the embodiment shown in FIG. 4, related to the application to a gas cooking range 3b known and only diagrammatically shown, each ignition assembly 60 consists of a ceramic spark plug 70 carrying contacts 20,21 at least partially embedded therein.

[0031] In such a case, each existing spark plug 70 is directly mounted on a burner 71 of cooking range 3b specifically designed for the use with ignition device 1 according to the invention; as shown in FIG. 4, burner 71 comprises a gas ring

72 and a plate 73, e.g. formed by ceramic, arranged in use over gas ring 72; this presents a radial recess 74 open towards plate 73 and accommodating an ignition assembly 60, in the case in point consisting of a double electrode spark plug 70, arranged with electrodes 20,21 essentially perpendicular to plate 73 in a radially more internal position within radial recess 74, so as to be covered in use by plate 73.

1. A device for lighting burners in a household appliance, in particular a cooking or barbecue range, comprising high voltage generating means accommodated within an electrically insulating casing, spark generating means adapted to be arranged near respective burners of said household appliance to be ignited and electrical connection means between said high voltage electrical generators and spark generating means; characterised in that, in combination:

- i) said high voltage generating means comprise one single secondary winding of a transformer provided with a single high voltage output contact and a single return contact, connectable to ground;
- ii) said spark generating means comprising, for each burner to be ignited, a pair of electrodes reciprocally and electrically insulated and reciprocally arranged side-by-side at a predetermined distance such that to allow sparks to be produced in use between the electrodes of the electrode pair;
- iii) said electrical connection means comprise a single electrical wire, a first end of which is connectable to said single output contact of high voltage generating means and a second end of which is connectable to ground; said single electrical wire connecting together in series all said pairs of existing electrodes and being subdivided by the electrodes of each pair of electrodes into a plurality of segments reciprocally and electrically insulated by the electrodes of each pair of electrodes, to form a chain of electrodes paired two-by-two.

2. A device according to claim 1, characterised in that said single secondary winding is dimensioned so as to be adapted to generate a sufficient voltage to produce sparks between the

electrodes of each predetermined pair of electrodes and equal to the maximum number of burners applicable to the household appliance.

3. A device according to claim 1, characterised in that said spark generating means comprise a plurality of ignition assemblies, each of which includes an electrically insulating body provided with fastening means to the household appliance; one said pair of electrodes carried by and accommodated in the electrically insulating body except for respective bare ends protrudingly carried side by the side by the insulating body; and a pair of contacts, each connected to a respective electrode and connected in series to respective corresponding contacts of said plurality of ignition assemblies by means of segments of said single electrical wire.

4. A device according to claim 3, characterised in that one said ignition assembly arranged farther from said high voltage generating means presents its first said contact connected in series to a corresponding opposite contact of an ignition assembly immediately closer to said high voltage generating means and its second said contact connected, by means of a terminal segment of said single electrical wire, to said return contact of the high voltage generating means.

5. A device according to claim 1, characterised in that each said ignition assembly consists of a ceramic spark plug carrying at least partially and internally embedded said electrodes of each pair of electrodes arranged side-by-side.

6. A burner for a household appliance, in particular for a gas range, comprising a gas ring and a plate arranged in use over the gas ring, characterised in that said gas ring presents a radial recess open towards the plate and accommodating an ignition assembly according to claim 5 arranged with the electrodes essentially perpendicular to the plate and in radially innermost position within the radial recess, so as to be covered in use by said plate.

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