

The present invention relates to an electronic igniter for appliances consuming a combustible gas and notably to a gas cigarette lighter.

An electronic igniter generally comprises an electricity generator comprising a fixed part, or an essentially fixed part, that is to say movable by only a very small amount, and a movable part, the activation of which has the effect of producing an ignition spark between two electrodes, where the first, fixed or essentially fixed part, comprising the burner of the appliance is connected to the fixed, or essentially fixed part of the generator and where the second is connected to the movable part, and arranged to be in the proximity of the first electrode at the moment of the release of the electrical energy which produces the ignition spark between the two electrodes.

In the patent FR-B-2573516 an ignition device is disclosed in which the two electrodes are fixed, the electrical connection between the second and the movable part of the generator being assured by a flexible electrical conductor the assembly of which requires operations which add to the cost of the assembly of the second electrode which raises the cost of the device.

In Japanese patent application JP-A-6191419 a device is disclosed in which the second electrode is fixed and comprises an elastically deformable rear extension which is located on the path of a conducting element or terminal of the movable part of the generator in such a way that this movable element is in contact with it at the moment of release of the required electrical energy for the production of the ignition spark.

In this device, at least the rear extension of the electrode

is comprised of an insulating material which is flexible and elastic such as a synthetic resin or rubber in which particles of electrical conducting material such as carbon black have been dispersed.

Although it provides satisfaction in terms of its function, this device includes the inconvenience of comprising an electrode or rubber or the like which results in difficulties and intricacies of handling in the installation during automatic assembly.

The present invention aims to alleviate these inconveniences. To this end in the device concerned and which has been described above, the second electrode, which is fixed and of an elastically deformable material, is provided, along its whole length, as a metallic wire such as a steel spring.

According to a preferred embodiment of the invention, which aims to facilitate the handling, in an automatic assembly machine, this second spring is entirely comprised by a helicoidal spring.

The invention will be understood by means with the help of the description which follows and reference to the accompanying drawings representing a non limiting embodiment of a form of execution of the ignition device, in the case of its application to a gas cigarette lighter.

Figures 1 and 2 are side elevations showing the upper end of a gas lighter held upright, with its head viewed in axial cross section, respectively in the rest position and at the end of the ignition activation.

The electronic ignition device applied to this gas lighter is the type comprising an electricity generator comprising a part 2 which is essentially fixed, that is displaceable to a small

extent, and a part 3 movable in the direction of the fixed part and situated above the latter. This device, which is not shown in detail, comprises a piezo-electric crystal and a hammer which is detached at the end of the length of stroke of the movable element 3 and results in the compression of a spring which tends to separate the movable element 3 from the essentially fixed element 2, the release of the hammer under the action of this spring is caused to hit against one of the ends of the piezo-electric crystal.

In the case of its application to a lighter, the part of the generator which is effectively fixed 2, of the electronic device is in fact slightly movable with respect to the spring not shown in the drawings and in which the force is slightly inferior to that which assures the projection of the hammer against the crystal. In consequence, during the displacement of the movable part 3 in the direction of the essentially fixed part, that is in the direction of the arrow 4, the essentially fixed part is displaced to a reduced extent in the same direction as the part 3 and at the start of the stroke of the latter.

As shown in the drawing, the electronic device 2-3 is displaced vertically downwards with respect to the head of the lighter in a recoverable manner by action of the activating button 5 of the ignition mechanism of the lighter. This button 5 is a known type which slides with respect to the body 6 of the lighter between two extreme positions, that is to say, an upper rest position, as shown in figure 1, and a lower position and the end of the activation as shown in figure 2.

The role of the electronic generator 2-3 is to produce a spark between the two electrodes and, in the case of its application to a lighter, one of the electrodes is comprised of a valve burner 7 of the lighter, that is to say by the free end of the

channel, through which the fuel exits in the gaseous state from stored liquid state in the reservoir provided in the body 6 of the lighter, whereas the other electrode 8 will be described in more detail.

The electrode 7 or first electrode, comprised of the valve burner 7 of the lighter, is electrically connected to one of the terminals 9 of the generator 2-3, by the intermediary of the lever 10 which controls the opening of the valve burner 7 and, as shown by comparing the figures 1 and 2 of the lighter, it is the stroke of the lever required during the course of opening which is very small and that of the valve burner 7 which makes it necessary to reduce the stroke of the essentially fixed part 2 of the generator 2-3.

The second electrode 8 of the device, which is connected to the other terminal 11 of the generator 2-3, that is the rigid terminal of the movable part 3 of the generator and which comprises a rear extension 8a, is also a fixed electrode made from an elastically deformable material. It is carried by a partition 12 of the head of the lighter, in such a way that the terminal 11 of the part 3 of the electronic generator 2-3 is in contact with its rear extension 8a when the movable part 3 attains the end position of its stroke in the direction of the fixed part as illustrated in figure 2.

In order to facilitate the assembly operations of this device the terminal 8 is made entirely from an electrically conducting, elastically deformable material such as a steel spring. In the example illustrated in the drawings, aiming again to improve the conditions for handling of this electrode 8 during the assembly of the head of the lighter in an automatic assembly line, this electrode 8 is comprised entirely by a helicoidal spring made of spring steel wire.

Preferably, as shown particularly in figure 2, the position of

the electrode 8 and, more particularly of its rear extension 8a on the partition 12 is located slightly ahead of the final position of the descending stroke, in the direction of the arrow 4, of the movable part 3 of the generator 2-3. This arrangement provides the advantage of assuring good electrical contact between the terminal 11 and the rear extension 8a of the electrode 8 at the end of the stroke of the movable part 3 of the generator 2-3, which avoids having to precisely respect the tolerances of manufacture.

According to another advantageous characteristic of the invention, the part of the terminal 11 which is destined to be in contact with the rear extension 8a of the electrode 8 is provided with a rounded cut out or seat 11a in order to better connect the rear extension 8a of the electrode 8 when this extension is curved towards the bottom as illustrated in figure 2. This arrangement further improves the electrical contact between the extension 8a and the terminal 11.

CLAIMS

1. An electronic ignition device for an appliance consuming a combustible gas and notably for a gas lighter of the type comprising an electricity generator comprising a fixed or essentially fixed part 2, that is to say displaceable by a stroke of small amplitude, and a movable part 3 normally maintained in line with the fixed or essentially fixed part 2 by a return spring and the activation of which has the effect of producing an ignition spark between two electrodes where the first fixed or essentially fixed 7, is comprised by the valve-burner of the appliance and is connected to the terminal 9 of the fixed or essentially fixed part 2 of the generator and where the second 8 is fixed and is provided with an elastically deformable rear extension 8a and located in the path of the terminal 11 of the movable part 3 of the generator in such a way that this terminal 11 is in contact with it at the moment of release of the electrical energy necessary to produce the ignition spark that is to say at the end of the stroke in the direction of the ignition of the movable element 3 of the generator, characterised in that the second electrode 8 is made along its whole length of an elastically deformable metallic wire which is a good conductor of electricity such as a steel spring.

2. A device according to claim 1, characterised in that the second fixed electrode 8 comprises a helicoidal spring of steel spring wire.

3. A device according either claim 1 or 2, characterised in that at least the rear extension 8a of the second electrode 8 is located slightly above the end position of the descending stroke of the movable part 3 of the generator.



4. A device according to any one of the preceding claims characterised in that the part of the terminal 11 destined to enter into contact with the rear extension 8a of the electrode 8 is provided with a rounded cutout or seat 11a adapted to improve the engagement of the rear extension 8a of the electrode 8 when it is curved towards the bottom at the end of the ignition stroke of the movable element 3.

