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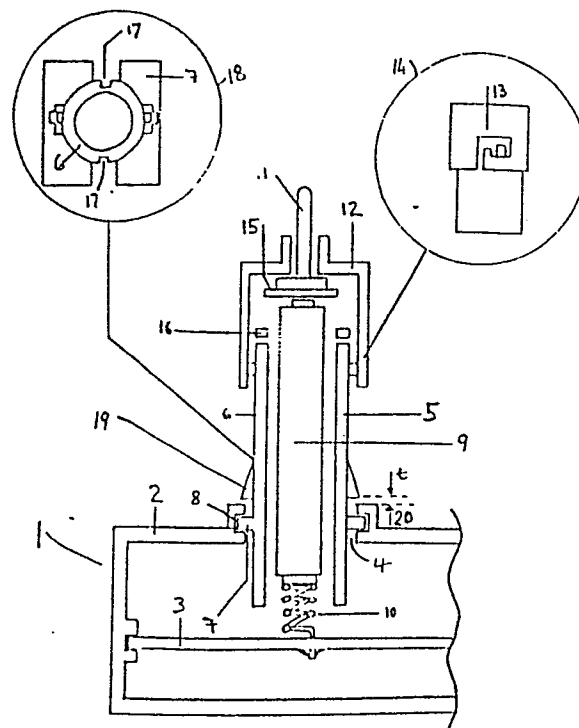
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(54) **Electronic ignition generators.**

(57) A battery powered electronic ignition generator is disclosed comprising a housing (2) containing a printed circuit board (3) on which is contained a pulse generating circuit (not shown) and a battery/switch assembly (5). The battery/switch assembly (5) consists of a housing (6) containing a battery (9) and a switch operating plunger (11) which operates in conjunction with the battery (9) in order to make or break an electrical circuit to the battery (9), the plunger (11) being removable for battery changing purposes.



ELECTRONIC IGNITION GENERATORS

This invention relates to electronic ignition generators and more particularly to battery powered electronic ignition generators which are adapted to be
5 incorporated in gas cooking appliances.

Electronic ignition generators, such as the TURNRIGHT GL 500 IGNITION GENERATOR, are known and are used to provide high voltage pulses which are applied, for ignition purposes, to suitable spark gaps in, for
10 example, gas cooking appliances, in which the ignition generator is incorporated.

In gas cooking appliances which do not have mains electricity fed to them, it is known to power the ignition generator from a battery. Usually the battery
15 is contained in a battery housing which is located at some convenient place on the appliance where it is accessible for battery changing purposes. In such appliances, it is usual to provide an "ignition" button which is operated when the ignition generator is
20 required to operate, such as when a tap of the gas cooking appliance has been turned "ON".

The provision of the ignition generator, the battery housing and the ignition button as separate items located at different parts of the gas cooking
25 appliance is necessarily expensive, and it is an object of the present invention to provide an improved form of ignition generator in which the three items are combined.

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In accordance with the present invention there is provided an electronic pulse generator comprising pulse generating means adapted to be operated from a battery, battery housing means, switch means for controlling the operation of said pulse generating means and switch actuating means for actuating said switch means, it being arranged that at least part of said switch actuating means is removable for battery changing purposes.

10 In a preferred form of generator, the removal of said part of said switch actuating means affords access to said battery housing means.

Typically the switch operating means will take the form of an operating button which is arranged to be located on a gas cooking appliance for "ignition" purposes, and by making this removable to provide access to an integral battery housing for battery fitting purposes, the separate provision of a battery housing and an ignition "button" are avoided.

20 An exemplary embodiment of the invention will now be described, reference being made to the accompanying single figure drawing which depicts a battery powered electronic ignition generator in accordance with the present invention.

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The battery powered electronic ignition generator depicted in the drawing is based on an existing electronic ignition generator 1, such as the TURNRIGHT GL 500 IGNITION GENERATOR, part of the housing of which is shown at 2 and part of the printed circuit board which carries the required electronic components (not shown) of which is shown at 3. Because the pulse generating means of such a generator is widely known it will not be described herein in detail except to state that it provides high voltage pulses which are applied, for ignition purposes, to suitable spark gaps on gas cookers and the like.

In order to provide required battery/switch functions, the housing 2 of the generator 1 is provided with a hole 4 into which is mounted a battery/switch assembly 5. The assembly 5 consists of a generally cylindrical battery housing 6 which is provided near one end with a flange 7 which slides into grooves 8 provided in the housing 2 adjacent the hole 4. The battery housing 6 contains a battery 9 which contacts at its lower end as viewed in the drawing one end of a compression spring 10 the other end of which is soldered to the printed circuit board 3. The spring 10 provides one electrical connection to the battery 9.

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At the other end of the battery housing 6 is provided a switch operating plunger 11 which extends through a battery retaining cover 12 which is attached to the housing 6 by means of diametrically opposed bayonet catches, one of which is shown at 13 in the "balloon" sketch 14.

The plunger 11 is provided at its lower end (as viewed in the drawing) with a metallic disc 15 which makes contact with the top-most electrical contact of the battery 8.

Due to the action of the spring 10, the plunger 11 in its un-operated state is forced against the inner, top-most surface of the retaining cover 12. When the plunger 11 is operated against the action of the spring 10, it is arranged that the metallic disc 15 contacts a metallic ring 16 which is electrically connected to the printed circuit board 3 by means of two wires or rods (not shown) which extend down the outside of the housing 6 in grooves 17 shown diagrammatically in the "balloon" sketch 18. Thus, when the plunger 11 is operated, electrical connection is made between the top-most terminal of the battery 9 and the printed circuit board 3, thereby enabling the pulse generating means of the electronic generator 1 to be switched ON and OFF.

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In operation, in order to fit or change a battery 9, the retaining cover 12 together with the plunger 11 is removed, the battery 9 is fitted and the cover 12 is replaced. To operate the electronic ignition generator the plunger 11 is pressed until the metallic disc 15, which is in contact with the top-most terminal of the battery 9, contacts the metallic ring 16, thereby completing an electrical circuit between both terminals of the battery 9 and the printed circuit board 3.

The spring 10 performs three functions: It forms an electrical connector between one terminal of the battery 9 and the printed circuit board 3; It ensures that the metallic disc 15 is separated from the metallic ring 16, thereby breaking the electrical circuit to the battery 9; and it ensures that the battery 9 is pushed clear of the housing 6 when the retaining cover 12 is removed, thus allowing a user to grip the end of the battery 9 for removal.

It is envisaged that the battery powered electronic ignition generator depicted in the drawing may be fitted to an appliance, such as a gas cooker, simply by providing a hole in the appliance facia to accept the cylindrical housing 6. The unit may be pressed into place from inside the appliance, and held in place by spring catches 19 moulded in the side of the housing 6. The gap "t" at 20 is arranged to be

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a tight fit for the facia panel. Alternatively the outside of the housing 6 could be threaded and the unit held in place by a nut. Another alternative would be to press a "spire" nut over the outside of the housing 6.

The outer end of plunger 11 can either be styled to suit the appliance or it can readily be adapted to carry a styled knob as specified by the appliance designer.

It is envisaged that battery housing 6, cover 12 and plunger 11 would normally be made from a suitable thermoplastic material such as polypropylene. Alternatively plunger 11 could be made from a conducting material such as brass, thereby obviating the need to provide the separate metallic disc 15.

In addition it is envisaged that the need to provide the separate plunger 11 movable in the cover 12 may be obviated by arranging that the locking slot of the bayonet catches e.g. 13 are extended to allow the cover 12 to be moved relative to the housing 6 whereby the metallic disc 15, which in this case would be fixed inside the cover 12, could be moved into and out-of contact with the metallic ring 16. In this way cover 12 could form the switch knob itself and could be suitably styled.

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It is also envisaged that the provision of the metallic ring 16 could be obviated simply by arranging that the end of one or more of the wires or rods (not shown) that extend down the outside of the housing 16
5 in grooves 17, are bent over the top lip of moulding 6 such that it is arranged to contact the metallic disc 15 when the plunger 11 or the cover 12 is depressed.

CLAIMS

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1. An electronic ignition generator comprising pulse generating means (1) adapted to be operated from a battery (9), battery housing means (6), switch means
5 (15,16) for controlling the operation of said pulse generating means (1), and switch actuating means (11) for actuating said switch means (15,16), characterised in that at least a part of said switch actuating means (11) is removable for battery changing purposes.
- 10 2. A generator as claimed in claim 1, in which removal of said part of said switch actuating means (11) affords access to said battery housing means (6).
3. A generator as claimed in claim 1 or claim 2, in which the switch means (15,16) takes the form of
15 a plunger-type switch.
4. A generator as claimed in claim 3, in which a battery (9) is adapted to form part of a plunger assembly of said switch.
5. A generator as claimed in claim 3 or claim 4,
20 in which said switch comprises a generally cylindrical housing (6) adapted to contain a battery (9), an operating plunger (11) adapted to engage one end of the battery (9), cover means (12) through which the operating plunger (11) extends removably attached to
25 one end of the cylindrical housing (6), and spring means (10) adapted to engage the other end of the battery (9) for urging the battery (9) against said plunger (11).

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6. A generator as claimed in claim 4 or claim 5, in which the spring means (10) constitutes one electrical connection to said battery (9).

5 7. A generator as claimed in claim 4, claim 5 or claim 6, in which said plunger (11) includes contact means (15,16) for making electrical connection to said battery (9).

10 8. A generator as claimed in claim 7, in which the contact means (15,16) comprises a metallic conductor (15) carried by said plunger (11) and a fixed metallic contact (16) which is electrically connected to said pulse generating means (1), the metallic conductor (15) of said plunger (11) normally being displaced from said metallic contact (16) due to the
15 action of said spring means (10), and the metallic conductor (15) of said plunger (11) being caused to contact said metallic contact (16) when the operating plunger (11) is operated against the action of said spring means (10).

20 9. A generator as claimed in claim 8, in which the fixed metallic contact (16) comprises a metallic ring conductor which is located adjacent the said one end of said cylindrical housing (6).

10. A generator as claimed in claim 8, in which the fixed metallic contact (16) comprises a wire or rod extending along said cylindrical housing (6), the wire or rod being bent over the said one end of said
5 cylindrical housing (6).

11. A generator as claimed in any of claims 5 to 10, in which the pulse generating means (1) is contained in a housing (2), and the generally cylindrical housing (6) is adapted to engage a hole (4)
10 in said housing (2).

12. A generator as claimed in claim 5, in which the cover means (12) is attached to one end of the generally cylindrical housing (6) by means of a bayonet catch (13).

15 13. A generator as claimed in claim 5, in which the cover means (12) is attached to one end of the generally cylindrical housing (6) by means of a screw thread.

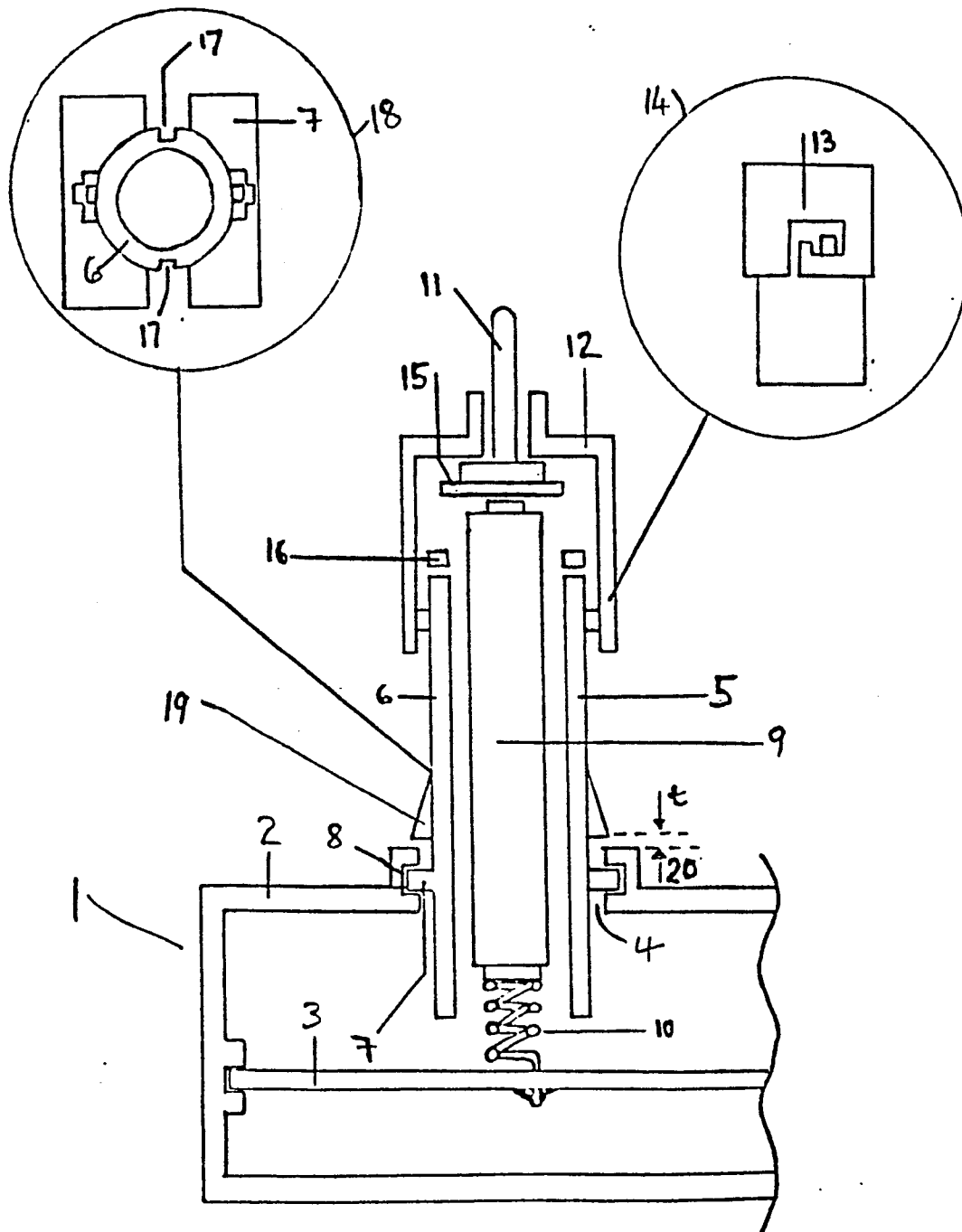
14. A generator as claimed in claim 5, in which
20 the cover means (12) is attached to one end of the generally cylindrical housing (6) by means of an interference ring.

15. A generator as claimed in any of claims 5 to 14, in which the generally cylindrical housing (6) is
25 adapted to be received in a hole in a supporting facia plate.

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16. A generator as claimed in claim 15, in which the generally cylindrical housing (6) comprises spring catch means for retaining said housing in said hole.

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
Y	FR-A-2 334 057 (PLESSEY HANDEL UND INVESTMENTS AG) * page 2, line 7 - page 4, line 37; figures 1-5 *	1	F 24 C 3/10 H 01 H 9/02
Y	--- US-A-4 484 253 (I.J. ROBERTS) * column 4, lines 27-34; figure 2 *	1	
A		2,3,5, 6,13	
A	--- US-A-2 111 467 (S.M. BURAK) -----		
			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
			F 21 L 7/00 F 23 Q 3/00 F 24 C 3/00 H 01 H 3/00 H 01 H 9/00
The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 20-11-1986	Examiner RUPPERT W
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	