

# PATENT SPECIFICATION

DRAWINGS ATTACHED

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## COMPLETE SPECIFICATION

### “Improvements in and Relating to Liquid Fuel Cigarette Lighters”

I, AUGUST COENDERS, of Kittelbachstrasse II, Düsseldorf-Kaiserswerth, Germany, of German Nationality, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention is in respect of a cigarette lighter which works on liquid fuel and wherein the supply of liquid fuel contained in the supply reservoir of the lighter is not absorbed by cotton wool or other absorbent material.

In the British patent specification Serial No. 806,746 there is proposed a lighter for liquid fuel where no absorbent material is involved, having a spring-loaded wick tube which moves when the snuffer cap is opened or closed and which is fitted with a sealing ring which is taken along with the wick tube as the latter moves. The wick tube is subjected to the action of the wick-tube spring, whilst the wick is itself again loaded by a spring inside the wick tube. When this lighter's snuffer cap is opened, a leaf spring is lifted clear of an upper sealing stopper, by which means the wick tube is first of all pushed upwards until such time as the sealing ring fitted around the wick tube comes to rest on a valve-seating, after which, the snuffer cap being opened still further and the leaf spring still rising, the wick itself is propelled out into its burning position. In the course of all this, the wick tube only moves about 0.5 mm whilst the wick itself is propelled some 4 to 5 mm outwards into its burning position.

Now it has been shown that, when the leaf spring is lifted clear of the upper sealing stopper, a connection is established between the fluid reservoir and the outside air, even though this connection is of very short duration, that is, namely, that it is present only for such time until the sealing ring fitted around the wick tube has settled on its valve-seating. This short space of time is however sufficient to cause a small amount of the liquid fuel to squirt out as a result of an over-pressure having been set up in the fuel reservoir due to its becoming heated while being carried in the user's pocket. In contrast with lighters known up to the present time, the lighter as specified in the British patent Specification Serial No. 806,746 has the advantage that the wick tube's valve stroke is shorter than the stroke executed by the wick, as a result of which it has been possible, very largely, to obviate the danger of fuel being squirted out.

The invention creates a lighter in which all communication on the part of the reservoir's contents with the outside air is completely prevented irrespective of the position in which the wick or wick tube happens to be in when the snuffer cap is opened.

The invention takes as its starting point a lighter for liquid fuel wherein the supply of liquid fuel contained in the supply reservoir of the lighter is not absorbed by cotton wool or other absorbent material, and having a spring-loaded wick tube which moves when the snuffer cap opens or closes, and which is equipped with a sealing ring which surrounds and moves along with the wick tube. It is proposed that the lighter shall include the provision of a vaulted recess in the bottom of the snuffer facing the top of the wick, in combination with provision for the sealing ring surrounding the wick tube to be capable of being compressed in a lengthwise direction. Moreover, the pressure force of the spring loading the tube is stronger than the longitudinal force of the compressed sealing ring. This means that the wick-tube spring is able to compress the sealing ring and hold it in its compressed position.

Since the wick in the wick tube can itself no longer be impinged upon by a spring, the wick may be constructed so as to be capable of being taken out of the wick-tube. The

(Price 3s. 6d.)

Price 25p

wick constitutes, together with a tube closed at one end, and a strip of metal, an interchangeable wick assembly. The metal strip referred to is made of a good heat-conducting material so that the heat of the wick's burning tip is conducted right down to the wick bottom and the vapour set up there ensures that the fuel is forced from the tube's blind end up to the tip of the wick.

The invention will now be further described with reference to the accompanying drawings illustrating an example of execution of the invention, and in which:—

Fig. 1 shows a section through the lighter as per the invention, with its snuffer cap closed,

Fig. 2 shows a part of the lighter in the same section as in Fig. 1, the snuffer cap being opened very slightly,

Fig. 3 shows the same section as in Fig. 2, with the snuffer cap opened wider, whilst

Fig. 4 shows the wick tube with its sealing ring, depicted in cross section.

Fig. 5 shows a wick assembly, and

Fig. 6 shows a further form of execution of the invention.

The lighter has a fuel reservoir designated generally by the reference number 10, the bottom walling 11 of which is fitted with a connecting piece 12 into which the filler screw 13 can be screwed. Fitted in an annular lug 14 is a tube 15 extending up to the top walling 16 of the reservoir 10 and serving to accommodate the flint 17, a pressure spring 18, and a set screw 19. The lighter's spark is generated by a friction wheel 20 which is actuated in the familiar way by a toothed wheel 21 when the snuffer cap 22 is opened. The snuffer cap 22 is hinge-mounted about a spindle 23 in such a way that the cap's right-hand member 24 moves downwards in the direction of arrow A whilst the left-hand member, a snuffer 25, moves upwards in the direction of arrow B.

Also fitted on the spindle 23 are the friction wheel 20 and the toothed wheel 21. The spindle 23 spans in the customary manner, the fork-shaped members of which only one—designated 26—is reproduced in the drawing. These fork-shaped members are connected by a middle portion 27 fitted on the top walling 16 of the reservoir 10 and connected to the latter as well. Between the fork-shaped members, there extends a further spindle 28 wound around which is a spring 29 one shank 30 of which bears against the oblique walling 31 of the reservoir 10 whilst the second shank 32 lies flush up against the top walling of the snuffer cap 22 at point 33.

By means of this spring, the snuffer cap 22 is held in its closed position. If the right-hand portion of the snuffer cap is depressed, say at point 34, the snuffer cap opens and the snuffer 25 is lifted clear of sealing stopper 35 which is fitted between the walling

sections 36, 37 or reservoir 10. The snuffer 25 has an annular projection 38 on its bottom edge giving rise to a vaulted recess 39 (Fig. 2 and 3).

Fitted inside the sealing stopper 35 there is a tube 40, the bottom end of which is recommended to be splayed outwards as shown at position 41.

The bottom walling 11 of the reservoir 10 also has a bushing 42 in which is fitted a spring 43 for the wick-tube, which bears at one end against the base of the bushing 42 and at the other end against the wick tube 44 which has an annular bulge 45. Above this annular bulge a sealing ring 46 is fitted on the wick tube, the outside diameter of which corresponds roughly to the outside diameter of the tube 40. The wick tube 44 has an outer diameter which is somewhat smaller than the inner diameter of the tube 40 so that, between the wick tube 44 and the tube 40, a tiny gap is formed—designated 47—the significance of which will be explained later on.

Accommodated in the wick tube 44 is a wick assembly, made up of a tube 48, one end of which is closed in, a wick 49, and a strip of metal 50. This strip of metal is made of good heat-conducting material. The wick proper may be made, in the familiar manner, of glass-fibre, or some other suitable material.

In the snuffer cap's closed position, snuffer 25 shuts off the tube 40 completely, the annular projection 38 fitting in the sealing stopper 35. In this position—the one depicted in Fig. 1—there is, between the bottom end 41 of the tube 40 and the sealing ring 46, a gap 51 through which the liquid fuel passes out of the inner chamber of the reservoir 10, through the gap 47, to the wick 49 as a result of capillary action.

With the beginning of the opening operation, as is shown in Fig. 2, the walling 52 of the snuffer 25 delimiting the vaulted recess 39 has been lifted clear of the tube 40, the annular projection portion 38 on the other hand is still lying on the plug 35 keeping it sealed off. The wick 49 has been pushed upwards via the wick tube 44 and the spring 43. The sealing ring 46 fitted around the wick tube 44 has been thereby caused to become pressed against the bottom end 41 of the tube 40, as a result of which the communication between the inner chamber of the reservoir 10 and the wick has been severed.

If the snuffer 25 is now opened further, as is depicted in Fig. 3, then the wick tube 44 can be pushed upwards still further by the spring 43, by which means the wick 49 arrives at its burning position, the end of the wick projecting some 4 to 5 mm above the tube 40. While the wick tube is being pushed upwards by the spring 43, the sealing ring 46, which is capable of becoming deformed

in a longitudinal direction, is deformed in the manner as depicted in Fig. 3, although it maintains at the same time the sealed connection with the bottom end 41 of the tube

5 40.

When the snuffer is being closed, its snuffer 25 presses on the top end of the metal strip 50 the bottom end of which rests on closed tube 48 and the latter, in turn, rests on the base of the wick tube 44. When the snuffer is being closed still further, the wick tube 44 is thus forced down against the pressure of the spring 43 until the position as shown in Fig. 2 has been reached. Up to that point the contents of the reservoir are prevented from coming into communication with the wick. It is not until the annular projection 38 of the snuffer 25 rests on the sealing stopper 35 that the sealing ring 46 lifts clear of the bottom portion 41 of tube 40 as a result of which the gap 51 is formed by way of which the fuel is henceforth again able to reach the wick 49.

It should be appreciated that, when the wick 49 comes into communication with the outside air, the supply of fuel to the wick is completely shut off. As a result of this, any escape of liquid fuel while the snuffer is being opened, and, consequently, the familiar squirting-out of fuel, is prevented.

In Fig. 4 are again reproduced in detail, the wick-tube 44, and the sealing ring 46 which bears against the bulge 45. Fig. 5 represents the wick assembly which is made up of the wick 49, the strip of metal 50 and the tube 48 which is closed at one end.

Represented in Fig. 6 is a form of execution in which the wick tube 53 is again fitted in a bushing 54. A pressure spring 55 bears against the bottom 56 of the wick tube 53.

In other respects, the constructional layout is the same as with the example of execution depicted in Figs. 1 to 3.

WHAT I CLAIM IS:—

1. Cigarette lighter for liquid fuel whose supply of liquid fuel contained in the supply reservoir of the lighter is not absorbed by cotton wool or other absorbent material, and having a spring-loaded wick tube which moves when the snuffer cap opens and closes, and which is equipped with a sealing ring which surrounds and moves along with the wick-tube, characterised in that the cigarette lighter includes, in combination, the provision of a vaulted recess in the bottom of the snuffer facing the top of the wick, and provision for the sealing ring surrounding the wick tube to be capable of being compressed in a lengthwise direction.

2. Cigarette lighter as claimed in Claim 1, characterised in that the pressure force of the spring loading the wick tube is stronger than the longitudinal force of the compressed sealing ring.

3. Cigarette lighter as claimed in Claims 1 and 2, characterised in that there is inserted in the wick tube a wick assembly made up of a wick, a tube which is closed at one end, and a strip of metal made from a good heat-conducting metal, and that the said wick assembly is capable of being removed, interchanged, and replaced.

4. Cigarette lighter, substantially as described and shown in the accompanying drawings.

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Fig. 1





