GAS LIGHTER HAVING A DISPOSABLE FUEL CONTAINER

Fig. 1
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5 Claims. (Cl. 431—143)

ABSTRACT OF THE DISCLOSURE

A pyrophoric cigarette lighter having a disposable fuel container which itself constitutes the main body of the lighter, complemental securing means forming part of the container and cooperating with corresponding complemental securing means carried by a separate igniting mechanism and a separate pressure reducer and burner unit for operatively and detachably affixing said unit and said mechanism to said disposable container.

Numerous gas lighters having a disposable refill cartridge allow the user to change by himself not only the cartridge or container, but also one of the components of the lighter. Such components, however, form complex assemblies and consequently expensive units. Generally, the pressure reducer and burner unit is either an integral part of the igniting mechanism or is permanently attached to the disposable container while the igniting mechanism forms a permanent unit with the body of the gas lighter and with the flint-carrying tube and the like.

The present invention has for its object the provisions of an improved gas lighter including separately interchangeable components constituted by the pressure reducer and burner unit, the igniting mechanism and the container, so that all reusable operating means, in particular the pressure reducer and the burner unit, may be made more durable while other components (fuel container and flint support) closely associated with the consumable items are of the inexpensive, throwaway type.

Briefly stated, according to the invention the novel gas lighter comprises a disposable container constituting the main body of the lighter, a reusable igniting mechanism and a reusable pressure reducer and burner unit, said mechanism and unit form two independent components, each carrying quick detachable securing means cooperating with complemental securing means forming part of the container.

The fact that the burner unit and the igniting mechanism are held on the container independently from one another ensures that stresses generated by the operation of the igniting mechanism are not transmitted to the burner unit or to the means securing it to the container.

The present invention has for its object the provisions of an improved gas lighter having a disposable fuel container, the interchangeable components being illustrated separately.

FIG. 2 is a perspective view of the various parts forming the ignition system and its support.

FIG. 3 is a perspective view of the container.

FIG. 4 illustrates a detail of the flint-carrying tube with its flint.

FIGS. 5 and 6 are partial cross-sectional views of the upper part of the lighter in its inoperative position and in its ignited condition respectively.

FIG. 7 is a view, partly cross-sectional, in a plane of symmetry of the assembled lighter.

FIGS. 8 and 9 are traverse sectional views through the upper part of the lighter along lines VIII—VIII and IX—IX of FIGS. 7.

In FIGS. 1, 2 and 5 to 8, the igniting mechanism designated as a whole by the reference letter A includes a support 4 of molded plastic material which shows a slight capacity of elastic deformation and the lower end of which is provided with a bore 22 opening into a slot so as to form an elastic clip or pincers, the opening of which faces the lower end of the lighter.

In the vicinity of its upper section, the support 4 includes a transverse section 40 (FIG. 2) provided with slides 5 and with a centering port 41 for the insertion of the flint-carrying tube 8.

The support 4 is furthermore provided at its upper end with grooves 1 adapted to be engaged by the outer flanges 3a of a metal flame guard 3 the cross-section of which is in the shape of a C and which is locked in position by the screws 2 engaging the tapped holes 2a in the transverse section 40.

The grooves or slides 5 are engaged by the lateral projections 9a of the strap 6 locked against lateral movement by the flame guard 3. Said strap 6 is provided, in its lower web section, with an opening 7 registering with the centering port 41 and, along the edges of the medial section of its upstanding flanges with notches 10 (FIG. 2) adapted to be engaged by the lateral projections 9a of a lever 9 constituted by a metal plate adapted to control the cap 11 on the pressure reducer and burner unit 28 (FIG. 7).

Said strap 6 is furthermore provided in the upper sections of its flanges with two elongated transverse slots 17 forming bearings for the ends of a spindle 12 common to the knurled wheel 13, to the driving wheel 14 for the latter and to a rocking cover 15 including lateral flanges 15a.

Lastly, the inner surfaces of the flanges of said strap carry two bosses forming stops 31 (FIG. 2) limiting the downward movement of the lever 9 and two further bosses 18 adapted to engage the notches 15b in the flanges 15a of the cover.

In FIGS. 1, 3, and 7, the container 16 forming the main body of the lighter is made of molded plastic material and its bottom 24 (FIG. 7) is transparent or translucent so as to allow ascertaining accurately the location of the level of fuel in the container. The latter is provided laterally with a broad longitudinal outer recess 29 (FIG. 1) adapted to serve as a housing for the support 4 while a pin 23 extending through and across the opposite walls of said groove is adapted to cooperate with the above-mentioned slotted bore 22 forming elastic pincers for said pin. The container is rigid with the flint-carrying tube 8 and with the socket 32 inside which the pressure reducer and burner unit 28 is secured in position.

The flint-carrying tube 8 (FIG. 4) is screwed through its lower threaded section 8a inside a recess 16a formed in the cover of the container 16. Said tube carries inside it a spring 25 inside the extreme upper convection 25a of which is fitted the flint 19, said spring engaging at one end the bottom of the recess 16a and at the other end the shoulder 8b formed inside the tube 8.

Obviously, the flint-carrying tube may be molded in one with the container 16.
The pressure reducer and burner unit 28 (FIGS. 1 and 7) includes a cap 11 subjected to the action of a lever 9 (FIGS. 5 and 6) and a lever 21 adapted to serve for adjustment of the flame, the notched free end of which lever projects outwardly through the slot 20 in the flame guard 2 to form a control member (FIG. 8). Said pressure reducer and burner unit includes furthermore a threaded element 27 constituted by a helical slope and the convolutions of which are cut so as to extend over only one quarter of a revolution and are adapted with a socket 32 formed on the container 16 and the shape of which matches that of the element 27; said unit 28 carries lastingly a punch or perforator 26 provided with an axial channel feeding the burner with gas.

The assembly of the two units described is performed as follows: the unit including the knurled wheel 13, its spindle 12, the driving wheel 14 and the cover 15 is positioned in a manner such that the notches 15b in flanges 15c of the cover engage the bosses 18 on the strap, after which the lever 9 is fitted between the flanges of the strap 6 inside the notches 10, so as to rest over the bosses 31 on the strap; the edges of the web of the strap 6 are then fitted inside the slideways 5 in the section 40 and lastly the flame guard 3 is positioned over said section. It should be remarked that the lever 9 is locked in position by the upper end 4a of the support 4, whereas the strap 6 is locked in position on the section 40 of the support and the spindle of the knurled wheel is locked inside said strap by the flame guard 3.

After having preferably brought the lever 21 adjusting the flame into the position corresponding to a minimum throughput, the pressure reducer and burner unit 28 is set in position over the container by hand or by means of a wrench by fitting the threaded element 27 inside the socket 32 and imparting a rotary movement to the pressure reducer and burner unit 28; the element 27 thereby is caused to rotate over one quarter of a revolution urging thus said unit towards the container and the punch 26 cuts a small disc 33 (FIG. 7) out of the upper wall of the container. The element 27 is fitted inside the socket 32 and is locked in position therewith by a flat surface 30 (FIGS. 7 and 9) formed on the socket and engaging the cooperating vertical surface 40a in the section 40. It is then sufficient to secure the support 4 of the igniting unit in position by setting the lower end of said support 4 in contact with the side wall of the container as provided by inserting it inside the recess 29 in the said container, after which the two parts are caused to slide with reference to each other with the support 4 remaining constantly inside the recess 29. The flint-carrying tube 8 engages then the opening 7 in the strap 6 (FIG. 2) and the flint wheel 19 engages on the spindle 12 in the slot 25; the end of the movement described, the slotted bore 22 engages elastically the pin 23 on the container so as to ensure the locking of the complete gas lighter. During said operation, the top of the cap 11 passes freely through the port 9b in the lever 9 which immediately exerts a pressure on said cap and stops the output of gas. It is now sufficient to set in the desired position the lever 21 adjusting the height of the flame and to adjust finally said flame during the first ignition period.

The ignition of the lighter (FIG. 6) is performed as follows:

The user's finger depresses the driving wheels or the like parts 14, so as to urge rearwardly the system including the upper and knurled wheel, the ends of the spindle 12 moving then along the slots 17; said movement produces simultaneously the release of the gas through a release of the pressure exerted by the lever 9 and a rocking of the cover 15 round the spindle 12 as provided by the stationary stud 16 on the flanges of the strap 6 (FIG. 2). The user who continues acting through his finger on the driving wheels constrains the knurled wheel to rotate so as to produce an igniting spark.

Upon closing of the lighter (FIG. 5), the forward movement of the mechanism rigid with the spindle 12 produces a rocking of the cover 15 into its closed position while the pressure reducer and burner unit 28 is closed by reason of the depression of the cap 11, by the lever 9 which is urged back against its elasticity by the driving means 14. The whole arrangement is locked in its closed position by the spring 25 on the flint 19 which is urged thus energetically against the knurled wheel 13.

Of course, the flint 19 is large so that it may last at least as long as the fuel carried inside the container.

Lastly, it should be remarked that the operation of the igniting means cannot at any moment damage the means securing the pressure reducer and burner unit on the container as might be the case if said unit were rigid with said igniting means.

Furthermore, the inverse sequence of the pressure reducer and burner unit with reference to the container allows resorting to a high grade pressure reducer and burner unit whereas the containers which cannot be reused, are otherwise provided necessarily with pressure-reducing and burner units of a low price, of which the operation is frequently unreliable.

What I claim is:

1. In a gas lighter of the type including a fuel container, an igniting mechanism and a burner unit, the improvement comprising a support attached to said igniting mechanism, a recess extending longitudinally along the outer surface of a side wall of the container and adapted to slidingly receive said support, a pin extending across the lower end of said recess, a downwardly open elastic clip forming part of the lower end of the support and engageable over said pin, a transverse section affixed to the upper end of the support and provided with a port, a flint-carrying tube secured to the container and adapted to pass through said port and a flint carried by said tube for engagement with the igniting mechanism.

2. In a gas lighter as claimed in claim 1 including a strap slidingly fitted over said transverse section and including upstanding flanges, and a spindle carried rotavably between said flanges and carrying the igniting mechanism in registry with the location of the flint, said spindle being adapted to pass through said port, a flint carried by said tube for engagement with the igniting mechanism, a strap slidingly fitted over said transverse section and including upstanding flanges, a spindle carried rotavably between said flanges and carrying the igniting mechanism in registry with the location of the flint, a flame guard including a vertical web and two vertical flanges parallel with the strap flanges and enclosing the igniting mechanism and the transverse section of the support to hold the strap and igniting mechanism in position.

3. In a gas lighter of the type including a fuel container, an igniting mechanism and a burner unit, the improvement comprising, a support attached to said igniting mechanism, a transverse section affixed to the upper end of the support provided with a port, a flint-carrying tube secured to the container and adapted to pass through said port, a flint carried by said tube for engagement with the igniting mechanism, a strap slidingly fitted over said transverse section and including upstanding flanges, a spindle carried rotavably between said flanges and carrying the igniting mechanism in registry with the location of the flint, a flame guard including a vertical web and two vertical flanges parallel with the strap flanges and enclosing the igniting mechanism and the transverse section of the support to hold the strap and igniting mechanism in position.

4. In a gas lighter as claimed in claim 2, including a flame guard having two vertical flanges parallel with the upstanding flanges of said strap and screws adapted to secure the flanges of the flame guard to the corresponding sides of the transverse section.

5. In a gas lighter as claimed in claim 4, including a cover rotavably carried by said spindle, said cover faces the upper end of said burner unit and includes two flanges of which at least one is provided with a notch, a boss formed on the flange of the strap facing the notched flange of the cover and engaging same to cause said cover to enter its depressed, burner closing position when the spindle carrying the igniting mechanism is in its
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5 Inoperative position nearest the location of said burner unit and to enter its released, burner opening position when said spindle is shifted back into its operative position farthest from the location of said burner unit.

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