

The present invention relates to a childproof gas lighter of the type having in its housing, in which is formed a reservoir containing the gas in liquid form, a head comprising in addition to the burner valve connected to the reservoir via a pressure reducer an igniting mechanism comprising control means for Opening the burner valve and means for making sparks.

In known lighters of this type after each actuation of the control button the intermediate link piece is returned automatically to its service position, that is coupled with the associated operating element.

The result is that it is very dangerous to leave this type of lighter within reach of a child who can without any difficulty ignite it.

In order to avoid this serious disadvantage it has been proposed to make childproof lighters, that is lighters in which associated with the igniting mechanism is means for neutralizing this mechanism movable between an active neutralizing position in which it impedes actuation of the igniting mechanism and a retracted position in which it permits such actuation, these movable means being displaceable manually by the user from the actuatable service position to the retracted position.

This type of lighter is known in particular from German utility Model number 88 02 582.9. Nonetheless in all these lighters a neutralizing means is not set up so as to be automatically returned to the actuatable neutralizing position after actuation of the igniting mechanism.

This return to the use position can only be obtained by a specific manoeuvre in the opposite direction by the user.

It is therefore easy to imagine that simply forgetting same completely eliminates the advantages associated with the presence of the neutralizing means.

By the documents WO-A-90/00239 and EP 0357347, the state of the art according to article 54(3), one knows of lighters in which the means of control for opening the valve is formed by a rocking lever pivotal on a fixed axis orthogonal to the axis of the burner valve and having one arm formed like a fork or elastic crown engaged under a collar of the burner valve and whose other operating arm is intended to be operated by the user by being pushed in a direction toward the housing of the lighter against the force of a return spring, the means for making sparks being themselves independent or associated with the control lever for opening the valve, and in which the neutralizing means of the igniting mechanism is normally held in the neutralizing position and is in addition set up to be automatically returned to the neutralizing position after operation of the igniting mechanism.

To ignite this lighter it is therefore necessary to know the move to do to retract the blocking means which, evidently, is not possible for a child. in addition after use the user does not need to move the neutralizing means back because its return to the service position is automatic.

In the lighters known from these two documents the means of operation are complex and the components required are also therefore complex resulting in an increased cost.

The present invention serves to remedy these inconveniences. To this effect, in lighter whose control means for opening the valve by a rocking lever is associated with means for neutralizing the igniting mechanism, this means is formed by a slide positioned under the operating end of the rocking

lever and movable parallel to the longitudinal axis of this rocking lever between a actuated position in which it projects with respect to the service end of the lever and a retracted position in which it is retracted toward the other end of the rocking lever, this slide being provided with guide means relative to the housing of the lighter having the shape of a horseshoe whose elastic legs carry a boss normally provided under a skirt bounding the service end of the rocking lever so as to impede rocking thereof in a direction to open the burner valve, the converging complementary flanks being formed on the inside faces of the side walls of the housing of the lighter and on the external faces of the arms of the slide to reduce the spacing of their bosses when the slide is moved into the retracted position so as to completely free the path of the skirt of the use end of the rocking lever while the transverse leg of the slide and the rear outside face of the skirt of the service end of the rocking lever have complementary flanks of the same slope that can cooperate with each other when this end of the rocking lever is pushed in to move the slide in the opposite direction into its actuated neutralizing position.

For example the guide means of the slide in the housing of the lighter are formed by central medial leg provided with a longitudinal aperture engaged on a shoulder of the same width as itself that is provided on pin carried by the housing of the lighter.

Advantageously the guide pin of the slide is the one which serves to centre the return spring of the rocking lever, the diameter of the shoulder being greater than that of the passage of this spring so as to form an abutment for it. Thus the spring does not bear directly against the central leg of the slide so that it does not impede its operation.

In any case the invention will be better understood with the help of the description which follows, reference being made to the annexed schematic drawing showing two embodiments of the lighter:

FIG. 1 is a top plan view of a first embodiment of the lighter with the cap covering the head broken away;

FIG. 2 is a side elevational view of the upper part of the lighter of FIG. 1;

FIG. 3 is a view like FIG. 2 showing a particular embodiment of the lighter of FIGS. 1 and 2;

FIG. 4 is a partial section taken along line IV-IV of FIG. 3;

FIG. 5 is a side elevation view partly in section of a second embodiment of this lighter;

FIG. 6 is a partial top plan view of the lighter of FIG. 5;

FIG. 7 is a partial view partly broken away of the lighter of FIG. 5 taken in the direction of arrow VII of FIG. 5;

Figure 1 is a partial perspective view partly broken away of the head of the lighter according to the invention;

Figure 2 is a top plan view of the object of FIG. 9, with the rocking lever retracted and the slide in the service neutralizing position;

Figure 3 is a partial section taken along line III-III of figure 2;

Figure 4 is a partial section taken along line IV-IV of figure 2;

Figure 5 is a top plan view similar to figure 2 with the slide being in the active position;

Figure 6 is a partial section similar to figure 3, following VI-VI of figure 5;

Figure 7 is a section taken along line VII-VII of Figure 5;

Figure 8 is a top plan view similar to Figures 2 and 5, with the slide in position for igniting the flame that is to say in the active position;

Figure 9 is section similar to Figures 3 and 6 taken along line IX-IX of Figure 8;

Figure 10 is a section taken along line X-X of Figure 8.

In the lighter illustrated in the drawings, the control means for operating the burner valve, not shown in the drawing, are formed by a rocking lever 15 pivoted on a fixed axis 16 orthogonal to the axis of the burner valve by means of two gudgeons 17 which are carried on the sides of its central part and which are engaged in sockets 18 formed in a cap whose sides 19 are unitary with the housing 21 of the lighter.

In the known manner, rocking of the lever 15 in the direction corresponding to a push in the direction of arrow 22 on the service end or rear end 15b has the effect of opening the burner valve.

A helical spring 23 continuously maintains the lever 15 in the position with the burner valve closed due to the force it exerts on the service end 15b of

this lever in a direction opposite to that of the arrow 22. The end of the spring 23 opposite the actuating end 15b of the rocking lever 15 is engaged on the guide and centring pin 26.

In this example the means for neutralizing the igniting mechanism is set up to oppose actuation of the rocking lever 15 in the direction of the arrow 22. In this example this neutralizing means is formed by a slide 36 moveable in the two directions illustrated by the arrow 37, that is toward and away from the burner valve between two end positions of which the one illustrated in figures 2 to 4 is the active neutralizing position for the igniting mechanism, that is the position in which it opposes any movement of the rocking lever 15, while its other end position illustrated in figures 5 through 7 corresponds to the retracted position in which movement of the lever 15 is made possible.

This slide 36 is located under the service end 15b of the rocking lever 15. This slide 36 is generally shaped like a horseshoe having elastic side arms 36a normally taking the spread position shown in figure 2, a position in which their free ends are braced against the inside faces of the upper ends of the side walls of the housing 21 of this lighter.

Each side arm 36a of the slide 36 carries on its upper face a boss 36b extending toward the service end 15b of the rocking lever 15 and in the normal position illustrated in figures 2 to 4 the pins 36b are just below a skirt 15'b which bounds the lower face of the actuating end 15b of the rocking lever 15. In this position of the slide 36 any movement of the rocking lever 15 in the direction of the arrow 22 is thus made impossible. In addition a branch portion 36c of the slide 36 has a projection 36d extending toward the rear of the housing of the lighter and which normally projects below the actuating end 15b of the lever 15 as shown in figures 2 and 3.

This same branch portion 36c of the slide 36 carries in addition a central medial portion 36e extending in the opposite direction to that of the projection 36d and formed with a longitudinal aperture 36f intended to be engaged over the guide pin 26 of the spring 23 below same as shown in particular in figure 11. In this regard it is noted that in order to avoid that the pressure of the spring 23 interferes with movement of the slide 36 in the direction of the arrow 37 the pin 26 has at its base a shoulder 26a at least partly of a width corresponding to that of the aperture 36f of the central medial portion 36e of the slide 36 but smaller than the passage of the spring 23. Naturally the height of the shoulder 26a is at least equal to the thickness of the central medial portion 36e of the slide 36. As shown in the drawing and more particularly in figures 2, 5, and 8, the free ends of the side arms 36a of the slide 36 are bevelled so as to present converging flanks 36'a while the inside faces confronting the upper ends of the side wall of the housing 21 of the lighter have complementary flanks 21a against which the flanks 36'a of the lateral branches 36a of the slide 36 normally engage as shown in figure 2.

It is therefore easy to see that movement of the slide 36 by acting on its rear projection 36d in the direction of the arrow 38 has the effect of sliding the flanks 36'a of these side arms 36a along the flanks 21a of the walls of the housing 21 of the lighter and of thus provoking a squeezing-together of the arms 36a into the approached position shown in figure 5, that is in the position in which the free ends of the side arms 36a of the slide 36 have gone past the flanks 21a of the housing of the lighter. As shown more particularly in Figure 7, in this position of the slide 36 the bosses 36b carried by the side arms 36a are moved toward each other to a spacing such that they are no longer in the path of the corresponding parts of the lower skirt 15'b of the actuating end 15b of the rocking lever 15. This rocking lever 15 can therefore be moved in the direction of the arrow 22 to control igniting

of the lighter as shown in figure 9. Nonetheless as shown more particularly in this figure, means is provided so that this rocking of the rocking lever 15 automatically instigates a return of the slide 36 into its position neutralizing the igniting mechanism, that is blocking the rocking lever 15. In the example illustrated in the drawing this means comprises on the one hand a flank 36g extending downward and toward the rear of the bight 36c of the slide 36 and a complementary flank 15''b formed on the rear and lower edge of the skirt 15'b which bounds the lower face of the actuating end 15b of the lever 15. In reality the flank 36g of the slide 36 is formed on the rear edge of the actuating projection 36d of the slide 36.

As shown more particularly in Figure 9 it is obvious that when the actuating end 15b of the rocking lever 15 is moved downward, that is in the direction of arrow 22, its flank 15''b co acts with the ramp 36g of the slide 36 to displace same in the direction of the arrow 39, that is in the direction opposite that of the arrow 38. This displacement takes place obviously only at the end of rocking of the rocking lever 15 in the direction of arrow 22. It is necessary to note that at this instant nothing impedes the displacement of the slide 36 in the direction of the arrow 39 because the bosses 36b of the side arms 36a of the slide 36 slide against the inside faces of the skirt 15'b of the actuating end 15b of the rocking lever 15.

It is also necessary to note that the displacement of the slide 36 in the direction of the arrow 39 as a result of the action of the flank 15''b of the skirt 15'b on the flank 36g of the slide 36 is not necessarily sufficient to move the slide 36 all the way into its active neutralizing position illustrated in Figure 2. In effect, it is enough that this displacement allows the flanks 36'a formed at the free ends of these side arms 360 to engage the flanks 21a of the sides of the housing 21 of the lighter in order that the reciprocal action of the flanks 36'a and 21a deform the end of the travel of the slide 36

in the direction of the arrow 39.

The lighter of the invention has in contrast to those described before the important advantage of only needing a single additional piece relative to a lighter not provided with this safety device for child proofing. In addition it is important to note that this latter embodiment of the lighter has the advantage of not interfering with automatic testing systems for the lighter as they leave the factory such as checking the flame, checking operation, and checking flame extinction.

CLAIMS

1. A child resistant gas lighter comprising, that is to say a block ignition mechanism, of the type comprising:
on its housing 21 adapted to hold a reservoir of combustible gas in the liquid phase, a head comprising;
a valve connected between the a nozzle and the supply across a pressure reducer,
an ignition mechanism comprising operating means 15 to open the valve consisting of a rocking lever 15 rocking on a fixed axis 16 orthogonal to the valve axis 14 and having one end formed like a fork or elastic crown 15a engaged under a collar 14a of the valve 14 and another operating end 15b end intended to be operated by the user by being pushed in a direction 22 toward the housing 21 of the lighter against the force of a return spring 23; ignition means on the housing adjacent the valve actuatable for forming a spark, the ignition means being independent or associated with the lever 15 for opening the valve 14;

and in which neutralising means 8, 24, 31, 32, 36 are associated with the mechanism displaceable between a neutralising position preventing actuation of the ignition means and an active position permitting the ignition means to be actuated, whereby when the neutralising means is in the neutralising position the lighter cannot be lit, said neutralising means being manually displaceable by the user from its neutral position to its active position and being in addition arranged to be automatically returned to the neutral position, in order to operate the ignition mechanism the neutralisation means comprises a slide 36 being positioned under the operating end of the rocking



lever 15 and movable parallel to this rocking lever between an actuated position in which it projects with respect a service end of the lever and a retracted position in which it is retracted toward an opposite end of the rocking lever 15b, this slide 36 being provided with guide means relative to the housing 21 of the lighter having the shape of a horseshoe whose elastic legs carry a boss normally provided under a skirt 15'b bounding the service end of the rocking lever 15b so as to impede rocking thereof in a direction 22 to open the burner valve, converging complementary flanks 21a, 36'a being formed on the inside faces of the side walls of the housing 21 of the lighter and on the external faces of the legs 36a of the slide 36, and a rear outside face of the skirt 15'b of the service end 15b of the rocking lever 15 having complementary flanks 36a, 15''b of the same slope that can cooperate with each other when this end of the rocking lever is pushed in to move the slide 36, in the opposite direction, into its actuated neutralizing position.

2. Lighter according to claim 1, characterised in that the guide means of the slider 36 in the body 21 of the lighter comprise a central medial portion 36e provided with a longitudinal aperture 36f engaging on a shoulder of the same width as it, provided on a pin 26 carried by the housing 21 of the lighter.
3. Lighter according to claim 2, characterised in that the guiding pin of the slider 36 including a return spring 23 having a passage there through for said rocking lever 15, the diameter of the shoulder 26a being greater than that of the passage of this spring 23 so as to form an abutment for it.

