Sept. 2, 1969 A. VAN POPPEL 3,465,355

DISPOSABLE LIGHTER

Filed Dec. 19, 1967

Fig. 1

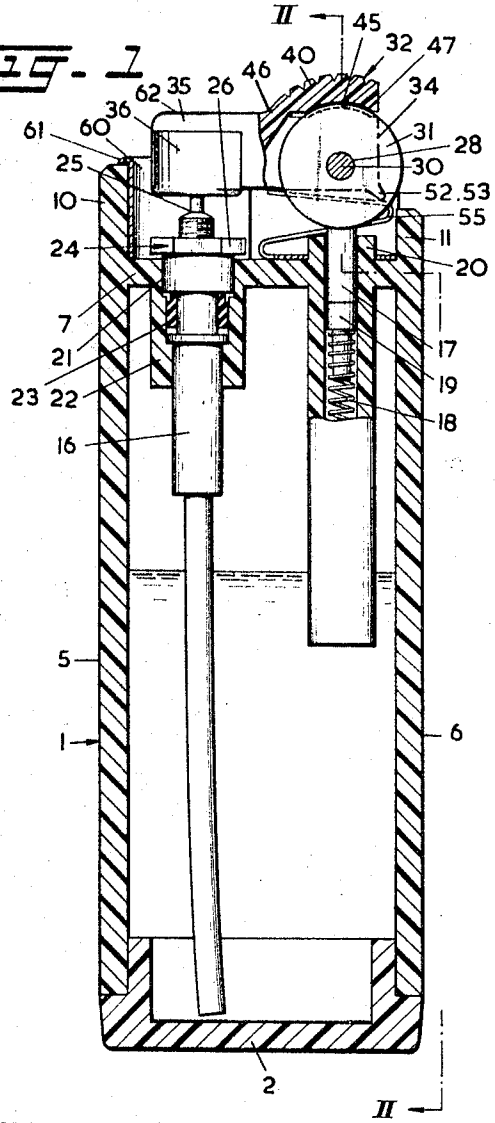


Fig. 2

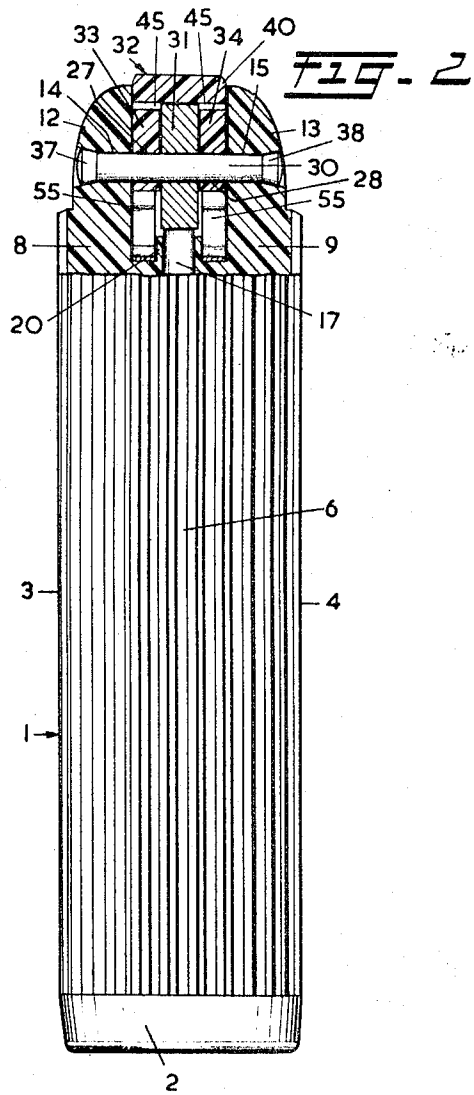


Fig. 3

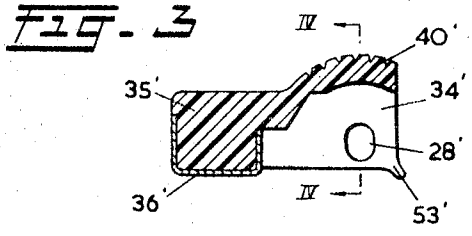
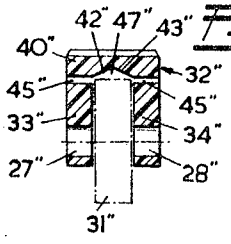


Fig. 4



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DISPOSABLE LIGHTER

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U.S. Cl. 431—126 13 Claims

ABSTRACT OF THE DISCLOSURE

A disposable cigar lighter with a minimized number of parts. The one-piece closure cap comprises a portion which is resiliently movable radially relative to the sparking wheel, said portion being operable by the user's thumb or other finger to frictionally engage said sparking wheel to rotate the same against a flint element to strike sparks when said portion is pressed by said thumb or finger to open the closure cap, the sparking wheel and the closure cap being mounted on a common shaft which is journalled in holes in the extended sidewalls of the fuel reservoir.

This invention relates to a lighter for cigars, etc., and particularly to a lighter of cheap design of the so-called disposable type.

It is an important object of the present invention to provide a low-cost disposable lighter by a special configuration of the constituent parts and by omitting several parts necessary in conventional lighters, without affecting the effectiveness in service of the lighter or causing inconvenience to the user.

It is another important object of the invention to provide a disposable lighter which can be assembled in a simple manner.

It is still another object of the invention to provide a disposable lighter having a large reservoir for lighter fuel of the liquefied, low boiling kind.

It is a further object of the invention to provide a disposable lighter which is convenient to handle and ensures a good grip in the hand of the user.

It is a still further object of the invention to provide a disposable lighter in which the amount of available fuel can be determined at a glance.

According to the present invention, there is provided a disposable lighter comprising a reservoir for holding liquefied inflammable fluid, an operative lighter assembly mounted on said reservoir, said assembly including a closure cap, flint holding means holding a flint element, a sparking wheel, a spring element in said flint holding means for biasing said flint element against said sparking wheel, a shaft for rotatably mounting said sparking wheel and for mounting said closure cap for pivoting movement between a closed and an open position, fluid outlet means for connecting the interior of said reservoir with the ambient air, a shut-off valve incorporated in said fluid outlet means and arranged to be in the closed position when said closure cap is closed, said closure cap having a portion which is narrowly spaced from the outer periphery of said sparking wheel and resiliently movable towards said sparking wheel so as to frictionally engage the same when pressure is exerted on said portion for moving said closure cap to its open position.

With this design of the cover, it is achieved that the conventional transmission means for rotating the sparking wheel, such as, for example, a pawl and ratchet wheel mechanism, become superfluous. There is thus achieved an important improvement, in a simple manner, even with respect to conventional lighters which, for the purpose

of avoiding the transmission means referred to, have a sparking wheel which is not covered by a cover, and in which the user has to operate the sparking wheel by directly engaging the outer circumference thereof with the thumb or finger, one disadvantage of which is that the finger becomes dirty and the sparking wheel greasy.

Several embodiments of the invention will now be described, by way of example, with reference to the accompanying drawings, wherein

FIG. 1 is a vertical longitudinal sectional view of the disposable lighter according to the invention;

FIG. 2 is a vertical cross-sectional view through the shaft of the sparking wheel, on the line II—II in FIG. 1;

FIG. 3 is a vertical longitudinal sectional view of a modification of the cover;

FIG. 4 is a sectional view of the cover on the line IV—IV in FIG. 3, but with a modified design of the sparking wheel engaging surface thereof.

Referring to the drawings, there is shown a flat cylindrical fuel reservoir **1**, made of a translucent or transparent synthetic material, and having a bottom **2**, which may be fixed therein, for example, by glueing. The plane sidewalls **3** and **4** and the round front wall **5** and round back wall **6** of the fuel reservoir are extended above the top wall **7**, the latter being formed integrally with the fuel reservoir, to form webs **8**, **9**, **10**, **11**. The webs **8** and **9** are provided with lugs **12** and **13**, respectively, having aligned shaft holes **14**, **15**, respectively. To ensure that the lighter does not slip from the user's hand, the outer surface of the reservoir may be provided with longitudinal grooves, the walls of which are preferably triangular in section to produce an attractive optical effect.

The top wall **7** of the fuel reservoir comprises an open-topped cylindrical tube **16**, which has a closed lower and extending into the reservoir **1**, and an axial flange **20**, extending above the top wall **7**, in which a flint element can slide axially, such flint element being biased upwardly by means of a spring **18** through a piston **19**. The top wall **7** further has an opening with an axial flange **22** extending into the reservoir. Mounted in this opening is a gas outlet unit **24**, sealed against leakage along the edge of the opening by means of a gasket **23**. The gas outlet unit **24** is of conventional design. Suffice it to say that when the gas outlet tube **25** is pressed down on to a valve (not shown) the latter shuts off the supply of gas, a nut **26** being provided to control, likewise in a conventional and well-known manner, the rate of effluent gas. Mounted in the holes **14** and **15** of the lugs **12** and **13** is a shaft **30**, which rotatably supports a sparking wheel **31** and pivotally supports a cover or closure member **32**.

The cover or closure member **32** is formed integrally from a synthetic material, and comprises spaced, parallel, depending sidewalls **33** and **34**, a front snuffing portion **35**, and a rear actuating portion **40**.

The snuffing portion **35** carries a metallic heat screen cap **36**, which is a clamping fit thereon, and serves to extinguish the flame and in the closed position of the cover presses down the gas outlet tube **25** to shut off the supply of gas.

The actuating portion **40** has an arcuate sparking wheel engaging surface which in the closed position of the cover is circumferentially spaced a small distance from the sparking wheel, thereby forming a slit-like interspace **47**, and is separated from the remainder of the cover **32** by two incisions **45**, so that it is only peninsularly connected thereto through a dam **46**, thus being resiliently movable relative to the remainder of the cover.

The depending walls **33** and **34** of the cover are each at their lower edges provided with a cam **52**, **53**, which rest on an upwardly biasing leaf spring **55**. In the position as shown in FIG. 1, the leaf spring through the cams

52, 53 forces down the shuffing portion 35 on to the gas outlet tube 25, so that no gas can escape.

The leaf spring is Z-shaped and has a holed lower end supported on the top wall 7 and surrounding the axial flange 20. Its upper part is bifurcated, the prongs or fingers thereof being disposed on opposite sides of the flint member 17 and the sparking wheel 31, each prong or finger cooperating with the lower edges and the cams 52, 53 of the depending walls 33, 34 of the cover 32.

The webs 8, 9, and 10 are protected from the flame of the lighter by a metallic liner 60, approximately C-shaped in horizontal section, having a beaded edge 61 and fixed by means of a clamping fit.

In use, the user puts his thumb or finger on the actuating portion 40 in the normal way, and flips open the cover, thereby exerting some pressure on the resilient portion 40, which will frictionally engage the sparking wheel, so that the latter is rotated against the flint element as the cover is flipped open, thus causing a shower of sparks to ignite the gas issuing from the gas outlet tube 25. As the cover is opened, the cams 52, 53, in cooperation with the leaf spring 55, will pass a dead centre, whereafter the spring will urge the cover to, and keep it in, its open position, the portion 40 finding an abutment on the web 11 of the rear wall 6 of the fuel reservoir 1. Conversely, in closing the cover, for which the user engages the upper surface 62 of the snuffing portion 35 with his thumb or finger, thus releasing the actuating portion 40, which consequently is disengaged from the sparking wheel, the cams again pass the dead centre, after which the spring urges the cover into, and retains it in, its closed position. Consequently, the sparking wheel remains stationary as the cover is closed.

It will thus be seen that the construction according to the invention permits a direct drive of the sparking wheel, so that the conventional transmission means can be eliminated. In fact, owing to the cooperation of the outer circumference of the sparking wheel, the movable part of the cover, and the user's thumb or finger, there is obtained an extremely cheap and simple ratchet wheel construction. By virtue of the small number of parts, the assembly of the disposable lighter according to the invention is extremely simple. In assembling the lighter according to the invention, the spring 18, the piston 19, the flint element 17, the sparking wheel 31 and the cover 32 are successively placed in position, whereafter the whole is fixed by inserting the shaft 30 into the holes 14, 15. After insertion of the shaft 30 the latter is fixed in position by expanding the ends 37, 38 thereof.

In FIGS. 3 and 4, parts identical or corresponding to parts shown in FIGS. 1 and 2 are designated by like reference numerals, except that they are provided with a prime in FIG. 3 and with two primes in FIG. 4.

FIG. 3 shows a modification of the cover according to the invention, in which the portion 40' overlying the sparking wheel is radially movable relative to the latter owing to the shaft openings 28' being elongated. Consequently, the portion 40' may be fixedly connected to the remaining part of the cover.

FIG. 4 shows a modification of the cover according to the invention in that the sparking wheel engaging surface, which has a flat cross-sectional configuration in FIG. 1, is grooved or V-shaped. It will be understood that the flanks 42'' and 43'' of the V-groove will firmly engage the sharp peripheral edges of the sparking wheel 31'', thus minimizing slip between the portion 40'' and the sparking wheel 31''.

Other modifications and variations of the invention will be readily apparent to those skilled in the art, and can be made without departing from the spirit and scope of the invention as defined in and by the following claims.

I claim:

1. A disposable lighter operable by the finger of a user comprising a reservoir for holding liquefied inflammable fluid, an operative lighter assembly mounted on said reservoir, said assembly including a closure cap with a finger engaging thereon, flint holding means holding a flint element, a sparking wheel, a spring element in said flint holding means for biasing said flint element against said sparking wheel, a shaft for rotatably mounting said sparking wheel and the mounting said closure cap for pivoting movement between a closed and an open position, fluid outlet means connecting the interior of said reservoir with the ambient air, a shut-off valve incorporated in said fluid outlet means and arranged to be in the closed position when said closure cap is closed, said closure cap having a portion which is narrowly spaced from the outer periphery of said sparking wheel and resiliently movable towards said sparking wheel so as to frictionally engage the same when pressure is exerted on said finger engaging portion by the finger of the user for moving said closure cap to its open position.

2. A disposable lighter according to claim 1, wherein and container consists of an integrally formed flat parallel-sided cylinder with a bottom wall and a top wall above which top wall the upstanding walls of said flat cylinder extend thereby substantially enclosing said lighter assembly, the two parallel extensions of said flat sidewalls of said flat cylinder forming a pair of parallelly spaced apart lugs provided with a pair of coaxial holes adapted to hold said shaft, said top wall carrying said flint holding means in the form of a tube having a closed bottom end positioned in the interior of the container and an upper end protruding upwardly out of the top wall with an axial flange adapted for guiding said flint element, said top wall further being provided with an opening for sealingly receiving said fluid outlet means in the form of an open-ended tube assembly having a bottom inner end submerged in the fluid in the interior of said container and an outer end extending in the ambient air on which outer end the free end of said closure cap is biased by said biasing means when being in its closed position and valve means incorporated in the tube assembly adapted to be closed by the closure cap when being in its closed position and to be opened when said free end of said closure cap is being disengaged from said outer end, the extension of the semi-circular wall of said flat cylinder which is nearest to said pair of lugs forming a cam adapted to arrest said closure cap in its outmost open position.

3. A disposable lighter according to claim 2, wherein the closure cap is fitted with two parallelly spaced apart, downwardly extending side-flanges having free bottom edges each provided with a cam which cooperates with said biasing means, said biasing means consisting of a Z-shaped leaf-spring with a forked top part and a holed bottom end, the bottom end of said leaf-spring resting on said top wall of said container and the top part of said leaf-spring engaging said cams, said leaf-spring being placed centrally around said flint holding means, said holed bottom end of said leaf-spring surrounding said flint holding means, and said forked top part of said leaf-spring flanking said flint and said sparking wheel.

4. A disposable lighter according to claim 3, wherein said closure cap is formed integrally with said portion of it of a resilient plastic, said portion being peninsularly connected to the remaining part of said closure cap.

5. A disposable lighter according to claim 3, wherein said closure cap is formed as a rigid whole, said portion of it being resiliently movable towards said sparking wheel by means of elongated holes in said parallelly and downwardly extending sidewalls adapted to pivotably suspend said closure cap on said shaft, said resiliency being provided by cooperation of said Z-shaped leaf-spring with said free bottom edges and said cams.

6. A disposable lighter according to claim 4, wherein the surface of said portion of said closure cap facing the periphery of said sparking wheel has an arcuate shape which is accommodated to the circular periphery of said sparking wheel.

7. A disposable lighter according to claim 5, wherein the surface of said portion of said closure cap facing the periphery of said sparking wheel has an arcuate shape which is accommodated to the circular periphery of said sparking wheel.

8. A disposable lighter according to claim 4, wherein the surface of said portion of said closure cap facing the periphery of said sparking wheel has a V-shaped cross-sectional configuration.

9. A disposable lighter according to claim 5, wherein the surface of said closure cap facing the periphery of said sparking wheel is V-shaped in section.

10. A disposable lighter according to claim 6, wherein the surface of said closure cap facing the periphery of said sparking wheel is V-shaped in section.

11. A disposable lighter according to claim 7, wherein the surface of said closure cap facing the periphery of said sparking wheel is V-shaped in section.

12. A disposable lighter according to claim 2, wherein said container is integrally formed of a light transmitting plastic.

13. A disposable lighter according to claim 2, wherein said container is formed of a light transmitting plastic, the outer surface of the upstanding walls of said cylinder being longitudinally grooved.

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