

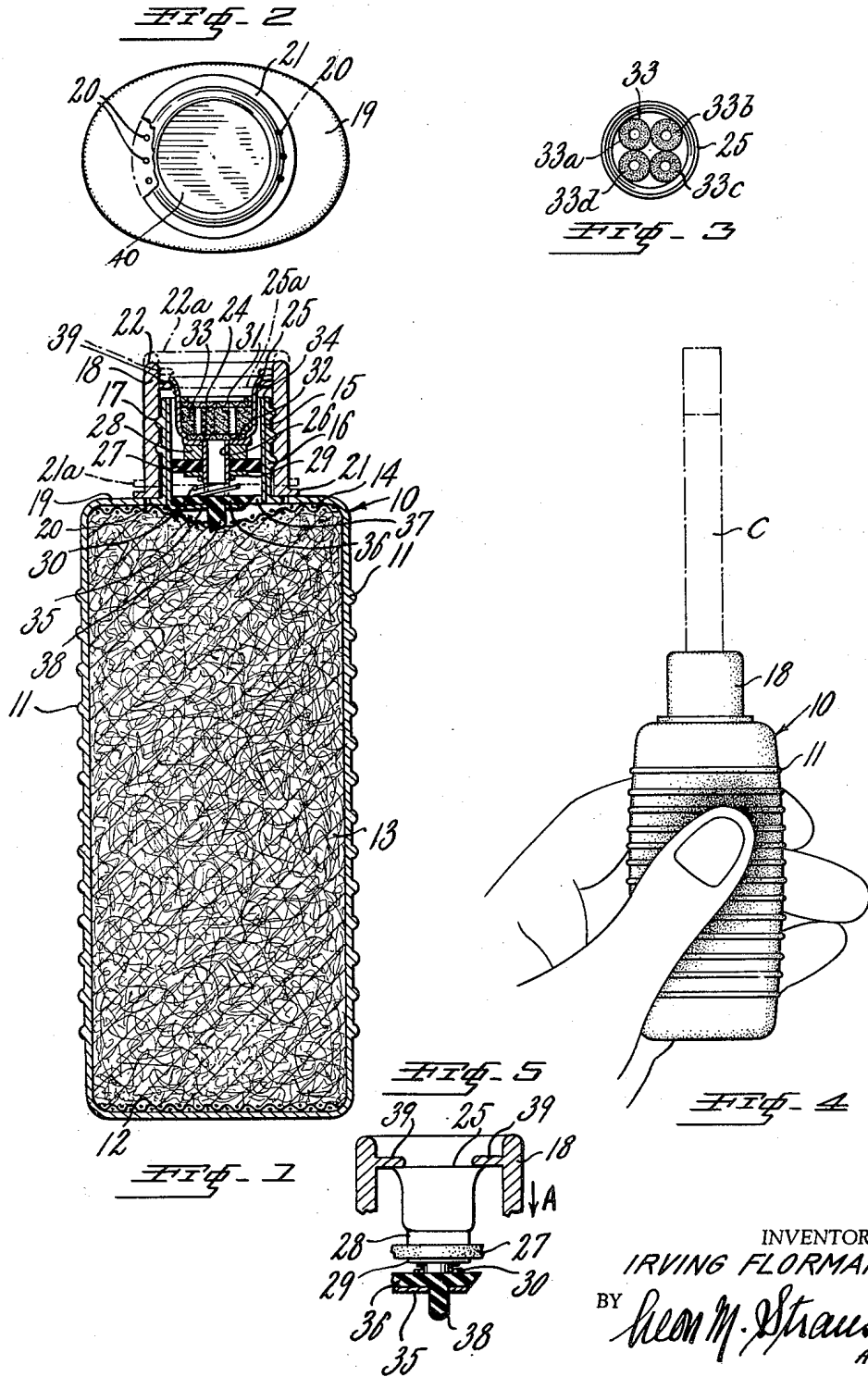
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LIGHTER STRUCTURE WITH COMPRESSIBLE, RESILIENT HOUSING

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1

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## LIGHTER STRUCTURE WITH COMPRESSIBLE, RESILIENT HOUSING

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The present invention relates to flameless lighters, and in particular to cigarette lighters of the catalytic type equipped with an element which becomes incandescent to afford lighting of the cigarette or like smoking article.

It is one of the primary objects of the present invention to provide means facilitating highly efficient operation of a flameless lighter of the aforesaid type without the necessity of directing to said element suction or puffing action by a person's mouth to bring about incandescence of the lighter element while the cigarette or like tobacco article is applied thereto as it was heretofore the case.

It is another object of the present invention to provide means conducive to an easy manipulation of the lighter housing which may be made from resilient, liquid-tight and acid-proof material, whereby upon compressing of the housing air-vapor mixture may be readily directed to the lighter element to bring about incandescence thereof.

It is a further object of the present invention to provide means offering the possibility of readily and conveniently assembling the few parts of which the novel lighter consists and the replacements of any parts thereof, if necessary, the manufacturing cost of the lighter being considerably reduced in comparison with lighters of this type heretofore placed on the market as said parts need no soldering nor any other bonding or fastening means to secure the parts in assembled condition.

Yet a further object of the present invention is to provide means conducive to a simplified construction of the lighter of the aforesaid type, which is absolutely safe in operation and avoids loss of lighter fluid employed in connection with the action of the lighter.

Still another object of the present invention is to provide means avouching efficient operation of valve means built into the lighter, whereby the lighter may be handled by even an unskilled person and without any danger while being carried around in a purse or pocket by said person.

These and other objects of the invention will become further apparent from the following detailed description, reference being made to the accompanying drawing showing preferred embodiments of the invention.

In the drawing:

Fig. 1 is a longitudinal sectional view of the lighter embodying the invention;

Fig. 2 is the top plan of the lighter of Fig. 1;

Fig. 3 is a top plan view of a specific detail of the lighter referred to in this specification;

Fig. 4 shows in perspective the lighter in its operable condition with a cigarette applied thereto.

Fig. 5 is a side elevational view, partly in section, of the upper portion of the lighter shown in inoperative condition.

Referring now more particularly to the drawing, there is shown in Fig. 1 a housing 10 made from known compressible and resilient plastic and like non-metallic material, such as polyethylene composition having the ribs 11 which in this instance, extend in crosswise direction of housing 10.

These ribs may also run in lengthwise direction of the

2

housing, if desired, to afford the necessary stiffness to the housing body. On the bottom of the housing 10 and therein there is positioned a lower wire mesh piece 12 on and above which extend fluid absorbent means 13 either in loose or compact form, an upper wire mesh piece 14 being positioned above said absorbent means to space the latter from the inner surface of upper wall 19 of housing 10. Housing 10 has an extension in the form of a hollow neck 15, which may be provided with outer threads 16 or similar means for the engagement with corresponding threads 17 of a cap member 18.

Through top wall 19 of housing 10 pass a plurality of minute perforations 20 adapted to provide inlet means for fresh air entering the interior of housing 10. Cap member 18 is provided at its lower end with a flange or skirt 21 constructed to overlie perforations 20 and to close the same when the lighter is not in operation. When displacing cap 18 along threads 16 of neck 15, flange 21 will be lifted to a position, as indicated in dotted lines 21a, while the upper end 22 of cap 18 will assume a position as indicated at 22a.

Within the interior of neck 15, there is located a metallic cup-shaped member 25 which has a bottom opening 24 in which is inserted a tubular element 26, which fits tightly in central opening 24 of cup member 25. Further affixed to the outer surface of tubular element 26 is a rubber gasket 27 which is sandwiched between an upper metal disc 28 and a lower metal washer 29, said disc-shaped parts 27 and 29 tightly fitting onto the outer surface of tubular element 26.

On the lowermost end of the aforesaid tubular element 26 there is attached spring 30 for a purpose about to be described. Within cup-shaped member 25 there are seated between upper and lower wire mesh members 31, 32 catalytic means 33 made of known material which according to the invention consists of a plurality of doughnut-shaped catalytic elements 33a, 33b, 33c and 33d.

These elements 33a to 33d function in unison, having sufficient space therebetween to let vapor-air mixture from tubular element 26 pass through them, in order to create incandescence of said elements or at least some of them and, to thereby assure always operativeness of the catalytic means of the lighter, when the housing is repeatedly compressed by an operator.

Fitted within neck 15 and tightly engaging the inner wall thereof is a reinforcement in the form of a cylindrical member 34 made of thin-walled metal provided with a bottom 35 on which a rubber washer 36 is seated. This rubber washer 36 has a projection 38 forming a spacer member to keep upper wire mesh piece or layer 14 out of contact with vapor-air mixture inlet 37, as is well observed.

A lateral cut out or inlet 37 in bottom 35 ensures that the aforesaid vapor-air mixture communicates with and ascends from within housing 10 through wire mesh piece 14 into the interior of said cylindrical member 34, whence said air-vapor mixture enters through tube 26 under pressure for contact with said catalytic means 33.

When the cap-shaped member 18 is seated with its flange 21 in contact with said perforations 20, it will be well understood that the cover 40, which is omitted in Fig. 1 abuts against and moves cup-shaped container 25 together with tubular member 26 and gasket 27 in downward direction against the action of the spring 30, so that the lowermost end of tubular member 26 is forced against the rubber washer 36 and thus prevents any further discharge of vapor and air mixture from inlet means 37 and thereby protects said catalytic means 33.

In such inoperative position of the cup-shaped member 25 of the lighter and the aforesaid catalytic means 33 are out of contact with the vapor-air mixture, of which a

3

small quantity may remain within the fluid-tight space defined by washer 36 and gasket 27.

If the lighter is operated without a cover 40 proper, or if the latter has been removed, shoulder or projection 39 extending inwardly from the inner wall of cap-shaped member 18 abuts against the upper end of said cup-shaped member 25 and will entrain and push the latter together with tubular element 26 in downward direction according to arrow A (Fig. 5), in which said cap member 18 engages with its flange the top wall 19 of the lighter housing, and the lower end of tubular element 26 engages the rubber washer 36 to shut off the supply of vapor-air mixture to the catalytic or incandescence producing means 33.

Instead of screw threads 16, 17 any known frictional or taper means may be employed to tightly and displaceably engage cap-shaped member 18 with neck 15 of the housing 10.

It can thus be seen, that there has been provided according to the invention a lighter structure having incandescence producing means, a housing for containing a fuel, said housing having air inlet means and being made of a plastic, resilient and compressible material adapted upon manual compression and release to produce suction and compression actions relative to said fuel within said housing, and means carried by said housing for directing vapors from said fuel when contained in said housing and further air sucked through said air inlet means into said housing for contact with said incandescence producing means, thereby enabling lighting a cigarette and like smoking article when same is brought into contact with said latter means.

Various changes and modifications may be made without departing from the spirit and scope of the present invention and it is intended that such obvious changes and modifications be embraced by the annexed claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent, is:

1. A flameless catalytic lighter for cigarettes and like smoking articles comprising a housing made of resilient and compressible plastic material, fuel receiving wick means contained in said housing, said housing terminating in a neck provided with external screw threads, a cylindrical member seated in said neck and having a bottom, said bottom being provided with an opening, a cup-shaped member for holding catalytic means and inserted in said cylindrical member, a tubular element having two ends and extending through an opening of said cup-shaped member, one of said ends terminating adjacent said catalytic means, a gasket seated on and surrounding said tubular element and being of a diameter corresponding to the inner diameter of said cylindrical member, a spring retained by the other end of said tubular element and spacing said cup-shaped member from said bottom of said cylindrical member, a cap in threaded engagement with said neck, said housing having minute perforations located adjacent said neck, said cap being provided with a flange normally overlying and closing said minute perforations when said cap is screwed down onto said neck, said cap flange freeing said minute perforations upon unscrewing said cap thereby causing said spring to urge said cup-shaped member away from said bottom of said cylindrical member, so that upon compressing and subsequent release of said resilient housing air sucked into the interior said housing through said minute perforations is pressed together with fuel vapors from said wick means through said tubular element for contact with said catalytic means, which upon contact with said vapor-air mixture becomes incandescent and enables lighting of a cigarette and like smoking article when the latter is inserted in the upper end of said cup-shaped member.

2. A flameless catalytic lighter for cigarettes and like smoking articles comprising a housing made of resilient and compressible plastic material, fuel receiving means contained in said housing, said housing terminating in a

4

neck, a cylindrical member seated in said neck and having a bottom provided with an opening communicating with said fuel receiving means, a cup-shaped member for holding catalytic means and inserted in said cylindrical member, a tubular element having two ends and extending through an opening of said cup-shaped member, one end of said tubular element terminating adjacent said catalytic means, a gasket seated on and surrounding said tubular element and of a diameter corresponding to the inner diameter of said cylindrical member to form a piston therein, a spring retained by the other end of said tubular element to space said cup-shaped member from said bottom of said cylindrical member, a cap engaging said neck, said housing having minute perforations located adjacent said neck, said cap being provided with a flange overlying said minute perforations for closing same, said cap flange freeing said minute perforations upon removing said cap flange therefrom thereby causing said spring to urge said cup-shaped member away from said bottom of said cylindrical member, so that upon compressing and subsequent release of said resilient housing air sucked into the interior said housing through said minute perforations is pressed together with fuel vapors from said fuel receiving means through said tubular element for contact with said catalytic means, which due to passage of vapor-air mixture becomes incandescent and enables lighting of a cigarette and like smoking article when the latter is inserted in the upper end of said cup-shaped member.

3. In a flameless catalytic lighter having catalytic means and fuel receiving means contained in a housing; said housing being made of a plastic resilient and compressible material and terminating in a neck, means fixedly seated in said neck and communicating with the interior of said housing, spring-urged movable means including a tubular element having one end terminating adjacent said catalytic means and another end extending toward the bottom of said fixed means, said housing having minute perforations located adjacent said neck, a cap provided with a flange overlying said minute perforations for closing same, said cap flange freeing said minute perforations upon removing said cap flange therefrom thereby causing said movable means with the other end of said tubular element away from said bottom of said fixed means, so that upon compressing and subsequent release of said resilient housing air sucked into the interior said housing through said minute perforations, is pressed together with fuel vapors from said fuel receiving means through said tubular element for contact with said catalytic means, to incandesce same and to enable lighting of a cigarette and like smoking article when in contact with said catalytic means of said movable means.

4. In a flameless catalytic lighter having catalytic means and fuel receiving means contained in a housing; said housing being made of a plastic resilient and compressible material and terminating in a neck, fixed means seated in said neck and having an opening in the bottom thereof communicating with the fuel receiving means in said housing, spring-urged movable means including a tubular element displaceable in said fixed means, said element having one end terminating adjacent said catalytic means and another end extending toward the bottom of said fixed means, said housing having minute perforations located adjacent said neck, and a cap on said neck and overlying said minute perforations for closing same, said cap freeing said minute perforations upon removing said cap therefrom, thereby causing said spring-urged movable means with the other end of said tubular element away from said bottom of said fixed means so that upon compressing and subsequent release of said resilient housing air sucked into said housing through said minute perforations, is pressed together with vapors emanating from said fuel receiving means through said tubular element for contact with said catalytic means, to make same incandescent and to enable lighting of a cigarette and like

5

smoking article when brought in contact with said catalytic means.

5. In a flameless catalytic lighter having catalytic means and fuel receiving means contained in a housing; said housing being made of a non-metallic resilient and compressible material and terminating in a neck, first means seated in said neck and having an opening in the bottom thereof communicating with the fuel receiving means in said housing, spring-urged second means including a tubular element displaceable in said first means, said element terminating adjacent said catalytic means and having an end extending toward the bottom of said first means, said housing having minute perforations located adjacent said neck, and a cap engageable with said neck and overlying said minute perforations for closing and opening same, said minute perforations being opened upon moving said cap away from said perforations, thereby causing said spring-urged second means with said tubular element to move away from said bottom to permit passage of air sucked into said housing through said minute perforations and vapors emanating from said fuel receiving means through said tubular element for contact with said catalytic means, thereby making same incandescent and enabling lighting of a cigarette and like smoking article when then brought in contact with said catalytic means.

6. The combination, in a lighter structure, of incandescence producing means, with a housing for containing a fuel, said housing having air inlet means and being made of a non-metallic, resilient and compressible material adapted upon manual compression and release to produce suction and compression actions relative to said fuel within said housing, means carried by said housing for directing vapors from said fuel when contained in said housing and further air sucked through said air inlet means into said housing for contact with said incandescence producing means, thereby enabling lighting of a cigarette and like smoking article when same is brought into contact with said latter means, and operable means located intermediate said incandescence producing means and said fuel containing housing for regulating flow of mixture of vapors from said fuel and of air sucked into said housing toward said incandescence producing means,

6

said operable means comprising cylindrical means seated on and in communication with said housing, displaceable means movably supported in said cylindrical means, tubular means connected to said incandescence producing means and movable with said displaceable means, and means establishing communication between said cylindrical means and said fuel containing housing to said tubular means, said tubular means obstructing in one position of said displaceable means said mixture of air and vapors from passage through said tubular means and in another position of said displaceable means permitting direction of said mixture to said incandescence producing means.

7. The combination according to claim 6, said incandescence producing means consisting of a plurality of doughnut-shaped elements arranged in direct proximity to each other.

8. The combination, in a lighter structure, of a non-metallic, resilient and compressible container terminating in a neck and adapted to be repeatedly compressed and released by the hand of an operator, with catalytic incandescence-producing means seated in said neck, said container being adapted to store a fuel therein and being in communication with said neck, means retaining said incandescence-producing means in said neck and slidably mounted to two extreme positions therein, and passage means leading into said container from there-without for admitting air to said fuel and for attaining a fuel-air mixture to be forced upon repeated compression and release of said container into contact with said incandescence-producing means in one position of the latter to afford lighting of a smoker's article and in another position to prevent said contact of said mixture with said incandescence-producing means.

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