

- (51) International Patent Classification⁷: A24F 47/00
- (21) International Application Number: PCT/GB02/04766
- (22) International Filing Date: 22 October 2002 (22.10.2002)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
10/012,238 24 October 2001 (24.10.2001) US
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- (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,

CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW.

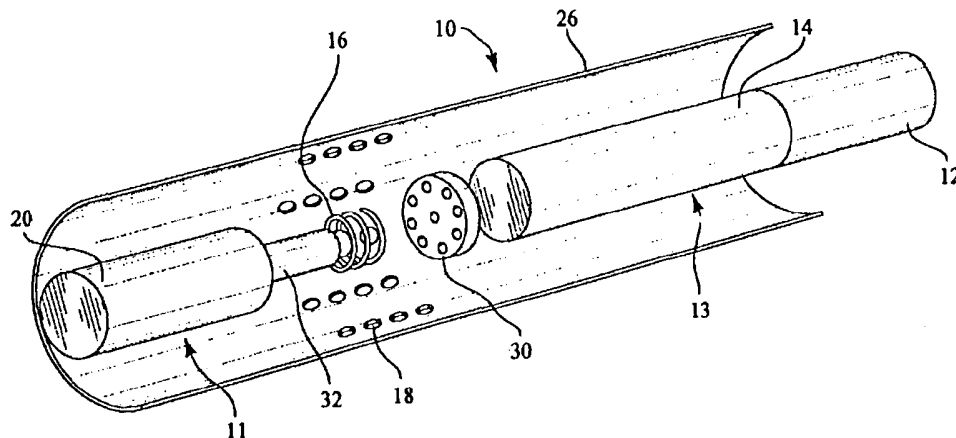
- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent

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- (54) Title: A SIMULATED SMOKING ARTICLE AND FUEL ELEMENT THEREFOR



- (57) Abstract: A simulated smoking article is provided in which a flavour generating medium, such as a commercially available cigarette, is heated with a fuel element including a liquid fuel therein to generate flavours or other components in vapour or aerosol form. A reusable fuel element is inserted in one end of a tubular member and a flavour generating medium, such as a cigarette, is positioned in the opposite end of the tubular member. Spacing between the fuel element and the cigarette is sufficient so that the cigarette is not lit but hot gases come into contact with tobacco or the like in the cigarette to vapourise the flavour components therein.



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GR, IE, IT, LU, MC, NL, PT, SE, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations

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Published:

- with international search report

The present invention relates to a simulated smoking article, which article has a fuel element physically separate from an aerosol-generating material, and more particularly a fuel element for a simulated smoking article.

Cigarettes, cigars and pipes are popular smoking articles which use tobacco in various forms as the medium which, upon being ignited provides an aerosol vapour flavourable material to the consumer. In recent years, it has become desirable to provide a smoking device in which the aerosol-generating material, including tobacco, is heated to a temperature sufficient to vapourise the aerosol-generating flavours in the tobacco or pipe materials, but the temperature is not sufficient for combustion.

Many of the smoking devices suggested in the art are adapted to look like conventional smoking articles, such as cigarettes, while other devices have been developed as an alternative to conventional smoking articles. These devices generally attempt to simulate conventional cigarettes without the combustion of tobacco products. For example, many devices include an internal aerosol forming material that is heated by an internal heating element. The heating stimulates the production of a flavourable aerosol for delivery to a user of the device. The internal heating element has conventionally been either a carbonaceous fuel element or an electro-chemical heat source which generate heat on contact with water. In these devices, the fuel element is not capable of being reused. Once the carbonaceous fuel element is lit, the fuel element continues to burn unattended until all the fuel in the element is consumed. In addition, the lit fuel element is very difficult to extinguish, either with water or other means for extinguishment. In an electro-chemical reaction, the difficulty encountered is in stopping the reaction, which only terminates when all of the reactants are consumed. Other devices include an electrical heating element for stimulating an aerosol forming substance. Although these are capable of being turned off between puffs, the electrical heating element requires a battery which requires extra efforts by the consumer and also is generally quite cumbersome.

Some of the earliest patents relating to aerosol-generating smoking articles are to be found in United Kingdom Patent Specification Nos. GB1,033,674 and GB1,083,761 (Battelle Memorial Institute). Other patents which teach smoking articles capable of providing the pleasure associated with cigarette smoking by heating, but not necessarily burning, tobacco or other similar type materials and without delivering considerable quantities of uncompleted combustion products, include, for example, U.S. Patent No. 5,065,776 to Lawson *et al* which teaches a fuel element positioned in heat exchange relationship with a physically separate

smoking article having a hollow tube with tobacco therein, the heat vapourising the aerosolising material in the tobacco being a temperature co-efficient thermistor in thermal contact with the tobacco, the thermistor being heated by an electrical current.

What is desirable in the industry is to provide an article that closely simulates a conventional cigarette, but does not require the combustion of tobacco and can be reused, at least in part.

It is an object of the present invention to provide a fuel element for a simulated smoking article as a heat source to vapourise flavouring compounds of a smoking article.

It is another object of the present invention to provide a fuel element for a simulated smoking article which contains a reusable smoking article.

It is a further object of this invention to provide a simulated smoking article which can have substantially the appearance of a conventional cigarette.

It is an even further object of the present invention to provide a simulated smoking article which includes a reusable fuel element in conjunction with a conventional cigarette.

The present invention provides a fuel element adapted for use with a smoking article comprising a fuel tank having an opening in one end, a fuel cartridge disposed within said fuel tank, said fuel cartridge including a liquid fuel, a wick in flow communication with said cartridge, and a glow element adjacent to said wick and operative in response to burning of fuel from said wick.

Preferably the liquid fuel is selected from the group consisting of ethanol and low molecular weight hydrocarbon oils

Preferably the glow element is comprised of copper, brass, platinum or a metallic alloy of these or other metals. Advantageously the glow element is a filament, which filament may be helically coiled, or otherwise arranged around the wick. Alternatively the glow element comprises a chamber containing catalyst material formed of beads or fibrous particles. The catalyst is suitably one or more of copper, brass, platinum-coated ceramic or a coated ceramic-based material.

Preferably the wick is comprised of non-burning fibres or a glass capillary tube or tubes.

Preferably the fuel cartridge comprises a porous medium. Advantageously the porous medium is selected from the group consisting of cellulose acetate, low density polyethylene, ethylvinyl acetate, carbon fibres, cotton or other fabric material.

Preferably the wick is enclosed by a tube extending into the opening of said fuel tank.

The present invention further provides a simulated smoking article comprising a tubular wrapper, a flavour generating material disposed within a mouth end of said tubular wrapper, and a fuel element disposed within a distal end of said tubular wrapper and being spaced from said flavour generating material.

Preferably the tubular wrapper is non-combustible on the application of a flame or at least not easily ignited. Suitable materials for the tubular wrapper are ceramic, meerschaum, metal, paper, paperboard, reconstituted tobacco, wood, bamboo, glass, metal foil, and combinations thereof. Any of the foregoing materials may be treated to prevent combustion. Chemical treatments for reducing a propensity for combustion are well known in the art.

Most preferably the flavour generating material disposed within the mouth end of the tubular wrapper is the tobacco rod of a cigarette. Alternative flavour generating sources, such as a porous cartridge containing aerosolisable material, or even a plug of tobacco material, may be used, if desired.

Preferably the fuel element of the simulated smoking article is the fuel element of the present invention.

Advantageously the simulated smoking article comprises a heat diffuser located between the fuel element and the flavour generating material. Preferably the heat diffuser is a wire mesh. The heat diffuser may be treated with a catalyst for converting carbon monoxide into carbon dioxide or another catalyst for converting or eliminating other selected hydrocarbons produced by various types of flames and heating elements. The heat diffuser may be of any type of appropriate material which meets the needs.

The fuel cartridge is suitably a fuel impermeable, non-combustible material, such as a ceramic material. The liquid fuel contained within the cartridge is preferably a clean burning fuel, such as a carbonaceous liquid fuel, for example alcohols, such as ethanol, methanol, isopropanol or propanol, or other low molecular weight hydrocarbon oils, such as pentane or hexane.

Preferably puffing air inlets are provided in the tubular wrapper. Advantageously the air inlets are located upstream of the heat diffuser, in other words in the region where combustion liquid fuel occurs at the glow element.

In order that the invention may be easily understood and readily carried into effect, reference will now be made to the following diagrammatic drawings in which like numerals refer to like parts throughout the several views and wherein:

Figure 1 is a partially fragmentary perspective view of one embodiment of a simulated

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