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(71) Applicant (for all designated States except US): **AUGITE INCORPORATION** [US/US]; 80 Wall Street, Suite 818, New York, NY 10005 (US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **LIU, Zhen** [CN/CN]; 3 Garden Road, Central Hongkong (CN).

(74) Agents: **COSTELLIA, Jeffrey, L.** et al.; Nixon Peabody LLP, 401 9th Street, N.w., Suite 900, Washington, DC 20004 (US).

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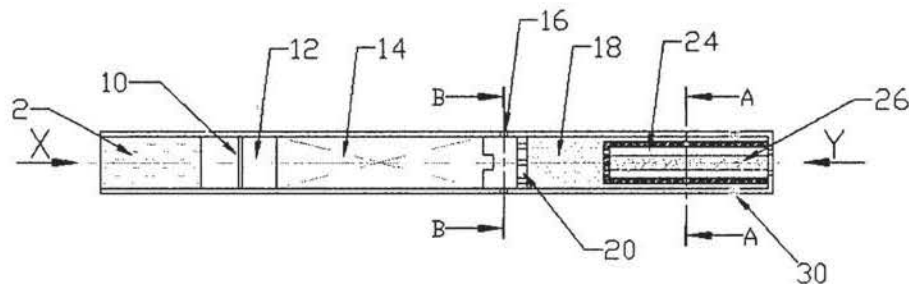
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: NO-TAR ELECTRONIC SMOKING UTENSILS



(57) Abstract: No-tar electronic smoking utensils includes a container (18) formed of a porous material for storing a liquid mixture. The container communicates with a heater vapouriser (24) via a series of small apertures (28). The heater is in the form of a spirally wound electrical heater (26) mounted on an electrical insulating support. Battery supply means are provided for the heater. The heater vapouriser communicates with a mouthpiece. In use, suction on the mouthpiece by the user causes air to be drawn through the porous container for liquid, over the heated vapouriser, into the mouthpiece and into the mouth of the user.

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NO-TAR ELECTRONIC SMOKING UTENSILS

TECHNICAL FIELD

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The present invention relates to no-tar electronic smoking utensils such as, for example, cigarettes, cigars and cigarette holders.

BACKGROUND

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Cigarettes are well known in which one end of a tobacco filled cigarette is held in the mouth of the user and the other end of the cigarette is ignited by a match or a lighter and the user draws on one end of the cigarette to draw the tobacco smoke through the cigarette into the mouth/lungs of the user. The health dangers of tobacco smoking are well documented and many products have appeared on the market in an attempt to assist smokers to cease smoking tobacco products or to provide a more healthy tobacco substitute.

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One such product is a "flameless electronic atomising cigarette" described in Malaysian patent application 03111582.9. The product is a non-combustible simulated cigarette and the user draws on one end of the "cigarette" to draw a nicotine vapour through the cigarette via a solution having a controlled amount of nicotine. The lack of a flame avoids inhaling tar and other unhealthy tobacco products, and the user can also control the amount of nicotine inhaled. The nicotine mixture of the prior art electronic cigarette is pumped through the device and is atomised by the use of a high frequency generator, a piezoelectric ultrasonic atomiser and a high-temperature gasification jet tube. The resulting vapour, lacking the

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conventional tar and unhealthy by- products, but including a controlled amount of nicotine, is inhaled by the user.

SUMMARY OF INVENTION

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It is an object of the present invention to provide a no-tar electronic smoking utensils which is a suitable alternative to known products and/or is of a simpler construction in comparison to known products.

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In accordance with one aspect of the invention, there is provided a no-tar electronic smoking utensils including:

a container for a liquid,

a vapouriser including heater means adapted to vapourise the

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liquid,

wherein air can be drawn by the suction of the user over the container and vapouriser to form a simulated smoke vapour.

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Preferably, in contrast to the above prior art device the vapourisation is effected solely or principally by the air distribution through the container in combination with the heat from the heating means.

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Preferably, in contrast to the above prior art device the flow of fluids through the cigarette is caused solely or principally by the suction of the user.

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Thus, the simulated cigarette of the present invention is of a simpler construction, easier to manufacture and more cost effective than the above prior art device.

Preferably, at least a portion of the container is formed of a porous material to facilitate distribution of the liquid through the container, prior to being fed to the heater means. Suitable materials include, for example, foamed metal, foamed ceramic or special fibre.

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In a preferred arrangement the heater means includes an electrical heater mounted on an electrical insulating support, for example a spirally wound heater wire.

10 The liquid mixture may be formed from any suitable materials/chemicals. The mixture could include a controlled amount of nicotine, however the mixture need not include a nicotine content.

15 Indicating/monitoring means may be included for the purpose of indicating a range of activities such as when a pre-set level of nicotine has been reached, when the unit is switched on or when the liquid in the container is low.

20 In a preferred arrangement simulated tobacco is provided in the tip end of the smoking article to give the article the appearance of a conventional smoking article.

The no-tar electronic smoking utensils preferably includes electrical supply means, such as a battery, to supply power to the heater and/or the indicator means. In a preferred arrangement power supply switch means are located adjacent the mouthpiece end of the cigarette, the power supply switch means being adapted to be activated by the lips of the user.

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In accordance with another aspect of the invention, there is provided a simulated cigarette including a container formed of a

porous material for storing a liquid mixture, the container communicating with a heater vapouriser via a series of apertures, said vapouriser including a spirally wound electrical heater mounted on an electrical insulating support, battery supply means for the
5 heater, said heater vapouriser communicating with a mouthpiece, whereby in use, suction on the mouthpiece by the user causes air to be drawn through the porous container for liquid, over the heated vapouriser, into the mouthpiece and into the mouth of the user.

10 **SPECIFIC EXAMPLE OF THE INVENTION**

In order to better understand the invention, an example will now be described with reference to the following drawings, in which:

15 FIG 1 is an enlarged side view of a simulated cigarette constructed in accordance with the invention,

FIG 2 is a cross- sectional side view of the simulated cigarette of FIG 1,

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FIG 3 is a tip end view of the simulated cigarette of FIG 1 looking in the direction of arrow X,

FIG 4 is a mouthpiece end view of the simulated cigarette of FIG 1
25 looking in the direction of arrow Y,

FIG 5 is a cross-sectional end view taken along the lines AA of FIG 2,

30 FIG 6 is a cross-sectional end view taken along the lines BB of FIG 2, and

FIG 7 is a schematic diagram of the electrical components of the example shown in FIG 1.

Referring to FIG 1 of the example, the simulated cigarette is of the
5 general size and shape of a conventional elongated cylindrical cigarette, having a tip end 2 and a mouthpiece end 4.

In broad terms, the simulated cigarette of the example is provided with a container for a liquid mixture, a heater for vapourising the
10 liquid, apertures for passage of air/mixture vapour through the cigarette into the mouth of the user, and a battery for supplying power to the heater.

Referring to FIGS 1 and 2, the simulated cigarette is provided with
15 an outer casing 6. The tip end 2 of the casing 6 is provided with simulated tobacco to give the simulated cigarette the appearance of a conventional cigarette. Modifications, such as choice and feel of materials, obvious to those skilled in the art, could also be made to give the simulated cigarette the look and feel of a conventional
20 cigarette.

Adjacent and inner the tip end 2 of the cigarette and mounted on the cigarette casing 6 is a light emitting diode (LED) 8. The LED is for the purpose of monitoring/indicating, amongst other things, the
25 level of liquid in the container and when a pre-set level of nicotine has been reached.

Located inner and adjacent of the simulated tobacco is a printed circuit board (PCB) control unit 10 for controlling the electrics of the cigarette.

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Adjacent and inner of the PCB 10, is a cylindrical battery chamber 12 for housing a battery 14. The cigarette outer casing 6, adjacent

the battery chamber 12 is provided with a plurality of apertures 16 to permit entry of air into the battery chamber. Adjacent and inner of the battery chamber 12 is a cylindrical liquid container 18 separated from the battery chamber by a dividing wall 20. The
5 dividing wall 20 is provided with a plurality of apertures 22 to permit entry of air from the battery chamber into the liquid container.

The container liquid mixture can be fed into the container 18 via a
10 one-way valve (not shown) mounted through the wall of the cigarette casing 6. The liquid container 18 is formed of porous inorganic material. The porous material of the liquid container facilitates the distribution and the mixing of the air and liquid mixture.

15 A cylindrical vapouriser heater assembly housing 24 is mounted within a central bore provided in the mouthpiece end of the liquid container 18. The vapouriser heater assembly housing houses a heater wire 26 spirally wound on a central ceramic insulating rod.
20 The walls of the heater housing 24 are provided with a plurality of apertures 28 to permit entry of the liquid/air from the liquid container 18 into the heater housing 24.

Adjacent the mouthpiece end 4 of the cigarette and mounted on
25 the cigarette outer casing 6 is a switch 30 activated, in use, by the mouth of the user for the purpose of switching on the battery power supply.

As indicated above, the liquid of the container may contain any
30 suitable chemicals, and may be provided with or without nicotine.

The approximate percentages of ingredients for a mixture containing nicotine are as follows:

1,2 propylene glycol 81%, nicotine 7%, distilled water 6%, glycerol triacetin 5%, formic acid, acetic acid, acetol and fragrance etc. 1%.

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The approximate percentages of ingredients for a mixture without nicotine are as follows:

1,2 propylene glycol 88%, distilled water 6%, glycerol triacetin 5%, formic acid, acetic acid, acetol and fragrance etc. 1%.

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In operation, the switch 30 is activated by the lips of the user touching the switch 30 thus switching on the battery power supply.

As best seen in the electrical schematic diagram of FIG 7, battery power is supplied to the PCB control unit 10, the LED 8 and the

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vapouriser heater 26.

As the user draws on the cigarette mouthpiece, air is drawn into the battery chamber, into the liquid container to mix with the liquid mixture, and into the heater assembly. The resulting vapour is drawn into the mouth of the user.

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CLAIMS:

1. A no-tar electronic smoking utensils including:
a container for a liquid,
5 a vapouriser including heater means adapted to vapourise the liquid,
wherein air can be drawn by the suction of the user over the container and vapouriser to form a simulated smoke vapour.
- 10 2. A no-tar electronic smoking utensils according to Claim 1 wherein the vapourisation is effected solely or principally by the air distribution through the container in combination with the heat from the heating means.
- 15 3. A no-tar electronic smoking utensils according to Claim 1 or Claim 2 wherein the flow of fluids through the cigarette is caused solely or principally by the suction of the user.
- 20 4. A no-tar electronic smoking utensils according to any preceding claim wherein at least a portion of the container is formed of a porous material to facilitate distribution of the liquid through the container, prior to being fed to the heater means.
- 25 5. A no-tar electronic smoking utensils according to any preceding claim wherein the heater means includes an electrical heater mounted on an electrical insulating support.
6. A no-tar electronic smoking utensils according to any preceding claim wherein the liquid includes a controlled amount of nicotine.

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7. A no-tar electronic smoking utensils according to any preceding claim including indicator means for the purpose of indicating when a pre-set level of nicotine has been reached.

5 8. A no-tar electronic smoking utensils according to any preceding claim including simulated tobacco at a first or tip end of the smoking article to give the article the appearance of a conventional smoking article.

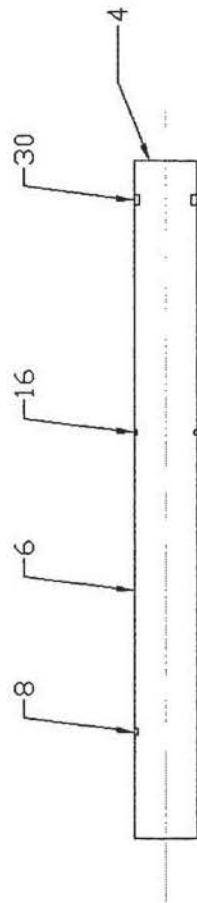
10 9. A simulated cigarette according to any preceding claim including electrical supply means to supply power to the heater and/or the indicator means, power supply switch means located adjacent the second or mouthpiece end of the cigarette, said power supply switch means being adapted to be activated by the lips of the user.

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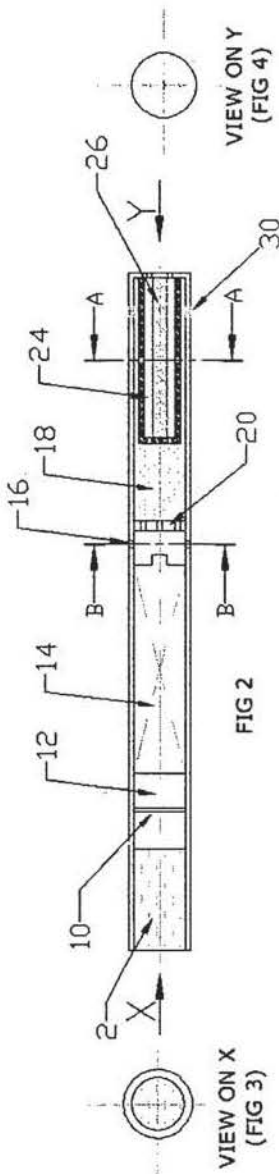
10. A simulated cigarette including a container formed of a porous material for storing a liquid mixture, the container communicating with a heater vapouriser via a series of apertures, said vapouriser including a spirally wound electrical heater mounted on an electrical
20 insulating support, battery supply means for the heater, said heater vapouriser communicating with a mouthpiece, whereby in use, suction on the mouthpiece by the user causes air to be drawn through the porous container for liquid, over the heated vapouriser, into the mouthpiece and into the mouth of the user.

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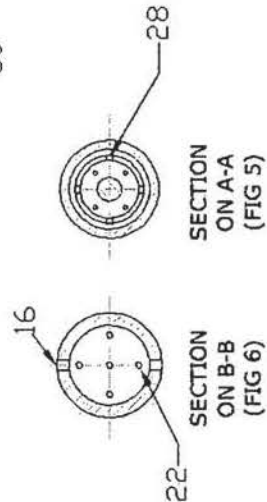
FRONT VIEW
(FIG 1)



VIEW ON X
(FIG 3)

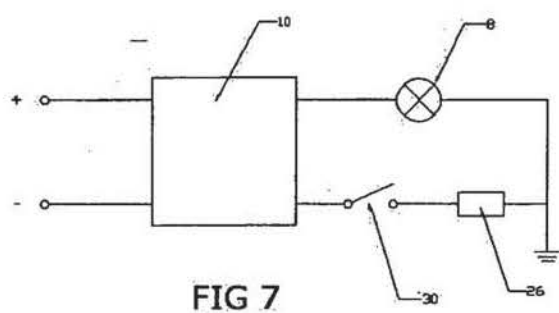
FIG 2

VIEW ON Y
(FIG 4)



SECTION
ON A-A
(FIG 5)

SECTION
ON B-B
(FIG 6)



INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

IPC: A 24 F 01/24

USPC: 131/194,329,347

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 131/194,329,347

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4,947,874 A (BROOKS et al) 14 August 1990 (14.08.1990), see entire document.	1-5
Y		6-10

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:

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Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Facsimile No. (571) 273-3201

Authorized officer

Dionne Walls Maves

Telephone No. (571) 272-1700