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UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.	104372.00002
First Inventor	Guocheng Pan
Title	Electronic Cigarette
Express Mail Label No.	

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

1. ☐ **Fee Transmittal Form** (e.g., PTO/SB/17)
2. ☑ **Applicant claims small entity status.** See 37 CFR 1.27.
3. ☑ **Specification** [*Total Pages* 14]
   Both the claims and abstract must start on a new page
   (For information on the preferred arrangement, see MPEP 608.01(a))
4. ☑ **Drawing(s)** (*35 U.S.C. 113*) [*Total Sheets* 7]
5. **Oath or Declaration** [*Total Sheets* 2]
   a. ☑ Newly executed (original or copy)
   b. ☐ A copy from a prior application (37 CFR 1.63(d))
   (for continuation/divisional with Box 18 completed)
   i. ☐ DELETION OF INVENTOR(S)
   Signed statement attached deleting inventor(s) name in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b).
6. ☐ **Application Data Sheet.** See 37 CFR 1.76
7. ☐ **CD-ROM or CD-R** in duplicate, large table or Computer Program *(Appendix)*
   ☐ Landscape Table on CD
8. **Nucleotide and/or Amino Acid Sequence Submission**
   (if applicable, items a. – c. are required)
   a. ☐ Computer Readable Form (CRF)
   b. Specification Sequence Listing on:
      i. ☐ CD-ROM or CD-R (2 copies); or
      ii. ☐ Paper
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ACCOMPANYING APPLICATION PARTS

9. ☐ **Assignment Papers** (cover sheet & document(s))
   Name of Assignee_____
10. ☐ **37 CFR 3.73(b) Statement** *(when there is an assignee)* ☑ **Power of Attorney**
11. ☐ **English Translation Document** *(if applicable)*
12. ☐ **Information Disclosure Statement** (PTO/SB/08 or PTO-1449)
    ☐ Copies of citations attached
13. ☐ **Preliminary Amendment**
14. ☐ **Return Receipt Postcard** (MPEP 503)
    (*Should be specifically itemized)*
15. ☐ **Certified Copy of Priority Document(s)**
    (if foreign priority is claimed)
16. ☐ **Nonpublication Request** under 35 U.S.C. 122(b)(2)(B)(i). Applicant must attach form PTO/SB/35 or equivalent.
17. ☐ Other:_____

18. If a CONTINUING APPLICATION, *check appropriate box, and supply the requisite information below and in the first sentence of the specification following the title, or in an Application Data Sheet under 37 CFR 1.76:*

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.: .....

Prior application information: *Examiner* _____ *Art Unit:* _____

19. CORRESPONDENCE ADDRESS

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Address					
City		State		Zip Code	
Country		Telephone		Email	

Signature	/Song Zhu, Reg. No. 44,420/	Date	May 7, 2009
Name (Print/Type)	Song Zhu	Registration No. (Attorney/Agent)	44,420

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	Electronic Cigarette
First Named Inventor/Applicant Name:	Guocheng Pan
Filer:	Song Zhu
Attorney Docket Number:	104372.00002

Filed as Small Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Utility filing Fee (Electronic filing)	4011	1	82	82
Utility Search Fee	2111	1	270	270
Utility Examination Fee	2311	1	110	110
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**462**

Electronic Acknowledgement Receipt

EFS ID:	5297215
Application Number:	12437511
International Application Number:	
Confirmation Number:	7646
Title of Invention:	Electronic Cigarette
First Named Inventor/Applicant Name:	Guocheng Pan
Customer Number:	44955
Filer:	Song Zhu/Danielle Peregory
Filer Authorized By:	Song Zhu
Attorney Docket Number:	104372.00002
Receipt Date:	07-MAY-2009
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Payment Type	Deposit Account
Payment was successfully received in RAM	$462
RAM confirmation Number	5140
Deposit Account	071850
Authorized User	

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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Specification	104372_2app.pdf	83241 8cc9cd3b49642d328d26ddad55fb70dfcf4e8891	no	14
Warnings:					
Information:					
2	Drawings-only black and white line drawings	104372_2draw.pdf	2688170 0a4f2ba05708fff39b1275583e1faeccee5f33af	no	7
Warnings:					
Information:					
3	Oath or Declaration filed	104372_2dec.pdf	90127 422ec3128be0e29c1e3418b25cc83965e579abb7	no	2
Warnings:					
Information:					
4	Transmittal of New Application	104372_2trans.pdf	50700 ef7f1d85052804fafc351f9f86dcb04b0da7d406	no	1
Warnings:					
Information:					
5	Fee Worksheet (PTO-875)	fee-info.pdf	32076 928ebc4f6990f544bdc42beca04407457e4a8009	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	2944314		

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If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

ELECTRONIC CIGARETTE

This application claims the priority of Chinese Patent Application No. 200910080147.5, filed March 24, 2009, the entire disclosure of which is incorporated herein by reference.

TECHNICAL FIELD

The present invention relates to an electronic cigarette.

BACKGROUND OF THE INVENTION

Tobacco smoking creates one of the most serious health threats to the mankind. Although people have used tobacco for centuries, cigarettes did not appear in the mass-manufactured form until the 19th century. Today, the number of smokers has grown to over 1.3 billion worldwide. In the high-income countries, smoking has been in overall decline for decades, although it continues to rise in some groups. In low- and middle-income countries, by contrast, cigarette consumption has been increasing. Death directly related to the use of tobacco is estimated to be at least 5 million people annually. If every tobacco user smoked one pack a day, there would be a total of 1.3 billion packs of cigarettes smoked each day, emitting a large amount of harmful tar, CO and other more than 400 gas contents to homes and offices, causing significant second-hand smoking damages to human health.

Nicotine is highly addictive. Tar in cigarettes increases smoker's risk of lung cancer, emphysema, and bronchial disorders. The carbon monoxide in smoke increases the chance of cardiovascular diseases. Secondhand smoke causes lung cancer in adults and greatly increases the risk of respiratory illnesses in children. It is hard to quit smoking. In order to overcome these problems, people have invented many new technologies and products, such as nicotine patches, nicotine gum, etc. Recently, several new inventions have been made, including a Japanese patent (#3-232481), which

proposes a simulated cigarette device with an insulated tube, inside which a heated generator and solid scent media are stored. Through an electric power source, the heat generator supplies heat to the scent media to generate an odor which is then absorbed to ease smokers' need for cigarette smoking. However, this simulated cigarette device requires a long time to reach a temperature high enough to generate the scent odor for users. Hence, this tool does not meet smokers' need.

A Chinese patent (#03111582.9) proposes a non-flammable atomizing electronic cigarette, which is intended to be a smoking cessation device and a replacement for conventional cigarettes. This product includes a shell, battery, high-frequency generator, nicotine-fluid chamber, controlling circuit, display screen, electronic inductor, body-contact transducer, piezoelectricity supersonic atomizer, and high-temperature air emitter. It also includes an electrically-controlled pump, metering valve, unidirectional injection valve, etc. Due to its extreme complexity in structure and very high manufacturing cost, this kind of electronic cigarettes is difficult to commercialize.

Another Chinese patent (#ZL200410048792.6) proposes an electronic cigarette, which has a stick-like shell, air-puffing hole, emitting device, pressure-modifying driver, control device, detection device, and smoke generator. This invention uses the control device to drive the emitting device to eject liquid drops generated from scent media outside of the shell. This invention also contains an atomizing device inside the shell, which vaporizes the liquid drops into vapor mists to be inhaled by the user by puffing through the smoke-flow hole at an end of the shell. This inhaling allows the user to absorb the scent-media in a vapor form together with the airflow inside the shell. In this way, the user is satisfied with a scent taste that mimics cigarette smoking.

In sum, the existing electronic cigarette devices have several major drawbacks: (1) too complex to be implemented as an ordinary consuming product and too costly for manufacturing and maintenance; (2) all having problems such as fluid leaking, reversal, nicotine-liquid exposing, discontinuous vaporizing, hard inhaling, and sub-standard sanitation; (3) all using mechanical devices as an airflow detector, which has a short life

and is too sensitive to outside temperature and humidity changes.

SUMMARY OF THE INVENTION

An electronic cigarette described and claimed in this patent application overcomes at least some of the above-described problems associated with the prior art.

An object of this invention is to provide a green alternative to harmful, polluting conventional cigarettes and to overcome at least some of the above-described problems associated with prior electronic cigarettes.

This invention adopts a brand new technical solution to create a device that highly resembles a conventional cigarette and the cigarette smoking process. An electronic cigarette of the present invention preferably is comprised of two parts, one being an electronic inhaler and the other being an integrated electronic atomizer. Each part may have a metal or plastic tube, and the two tubes may have an identical or similar diameter. The inhaler preferably includes one or more of an electric power source, electric sensor, single chip micyoco, and LED indicator. The electric power source, which can be a rechargeable or non-rechargeable battery, supplies electricity to the atomizer to vaporize a liquid inside an atomizer chamber. On the first end of the inhaler tube may be a cigarette cap with a small hole for airflow. On the second end of the tube may be an electric connector with either outskirt screw thread or a DC socket.

The electronic atomizer may include a liquid-container or a chamber inside the atomizer tube, which preferably also includes a heat equalizer that has an electric heat wire, a supporting piece which holds up the heat equalizer, and an electric connector. On the first end of the atomizer tube may be a cap with an air-puffing hole for the user to draw an airflow and for the emission of vapor mist. On the second of the atomizer tube may be an electric connector with either internal screw thread or a DC plug.

In a preferred embodiment, the connection between the electronic inhaler and

electronic atomizer through the connectors on both parts forms an entire electronic cigarette. When the user puffs on the electronic cigarette through the air-puffing hole on the first end of the atomizer, the electronic sensor detects an airflow and converts it to a signal, which then wakes up the single chip micyoco to record the signal. The single chip micyoco guided by its embedded software instructions may turn on the electric power source to supply an electricity current with a predefined time length. This electric current preferably flows through the electric heat wire inside the atomizer tube, which then heats up the heat equalizer with absorbed liquid from the liquid-container. The heated equalizer converts the liquid into a form of vapor mist, which is finally drawn into the month of the user. This completes an entire cycle of vaporizing process from which the user gets satisfaction of "smoking."

One of the unique technical advances in this invention is the integrated atomizer technology. Previous atomizing units are directly embedded into the inhaler tubes, while the liquid chamber is made as a separate piece, which must be inserted into the atomizing chamber before the electronic cigarette can be used. This old technology has several major drawbacks: (1) inconvenient in using the electronic cigarette, (2) insanitary and even unsafe to users due to the direct exposure of liquids, and (3) a short life for the atomizing unit. The integrated atomizer of the present invention is an integrated and disposable part, which overcomes some or all of the problems stated above. In addition, the integrated atomizer technology has also minimized the likelihood of a liquid leak, liquid reversal to the month when the user puffs on the electronic cigarette, and discontinuous vaporizing problems.

Another technical advance of the integrated atomizer is the material of the heat equalizer, which plays the key role in ensuring of large vapor volumes and the elimination of the disconnected vaporization problem. This material of the heat equalizer, which may be made of a non-toxic inorganic material, is required to withstand a high temperature up to 2000 degrees centigrade.

The electronic inhaler of the present invention represents the state-of-the-art

electronic cigarette technology in both structural design and microelectronic devices. One of the new technologies that may be used with an electronic cigarette of the present invention is the use of an electric airflow sensor instead of a mechanical device in detecting an airflow generated by the user's puffing and creating a signal for the microprocessor to activate the electric circuit. Once the circuit is activated, the electric power source sends an electric current to the system and the connected integrated atomizer, and the vaporizing process begins. When the puffing stops, the microprocessor instructs the electric power source to stop supplying the electricity current, and the vaporizing process stops.

This new technology provides a solution to the problems of the current inhaling technology by eliminating aging and short-life drawbacks of the current mechanical device technology. Moreover, the new technology also makes the puffing of users on the cigarette much easier and smoother. It is more sensitive in turning on and off the vaporizing process than the conventional mechanical system. The life of an electric sensor can last for five years, many times longer than the mechanical device.

The new electronic inhaler may also adopt a new technology of a protection board, which protects the inhaler from damage of a short-circuit event. Since use of electric connectors between the inhaler and atomizing units, there is always a likelihood of a short-circuit, which usually destroys some of the electric components on the circuit board, and sometime even destroys the electric power source – the battery. Incorporation of the protection unit completely eliminates short-circuit problems, and extends the life of the electronic inhaler.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 illustrates an electric circuit structure of an embodiment of the present invention.

Figure 2 is a section view of an integrated electronic atomizer of the present

invention.

Figure 3 is a section view of another integrated electronic atomizer of the present invention.

Figure 4 is a section view of an electronic inhaler of the present invention.

Figure 5 is a section view of another electronic inhaler of the present invention.

Figure 6 is a section view of an electronic cigarette of the present invention.

Figure 7 is a section view of another electronic cigarette of the present invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Referring to Figure 1, the electric power source 5 supplies an electric current to the electronic atomizer 22 and other electric units to heat up the heat equalizer through the connected electronic inhaler and atomizer 22 through the first electric connector 11 of the inhaler and the second electric connector 21 of atomizer 22. The electric sensor 6 plays the role of detecting the airflow resulted from the puffing action of a user, and wakes up the single chip micyoco 3 to turn on the electricity on/off switch 4 and generate an electric current form the electric power source 5 to the electronic atomizer 22 for vaporizing of a liquid inside the liquid chamber inside the atomizer 22. The single chip micyoco 3 instructs the electric power source 5 to supply electricity to the system by its embedded computer programs when a signal is generated through the airflow detected by the electric sensor 6 from the user's puffing action.

The LED indicator 12, which is connected to both the CPU processor 3 and electric power source 5, lights up when the electric current flows and it is turned off when the electric current stops flowing. The magnitude of the electric current supplied from the electric power source 5 depends on the magnitude of signal detected from the airflow

proportional to the strength of user's puffing action. This, in turn, controls the temperature and heat generated through the electric heating wire and heat equalizer. This process closely mimics the process of cigarette smoking.

Figure 2 shows a section view of one integrated electronic atomizer of the present invention with the second electric connector being of the screw thread type. The electronic atomizer includes an atomizer tube 263 and, inside the atomizer tube 263, a second electric connector 267 with an internal screw thread with a rush pith 11 surrounded by a silica-gel insulator 18, supporting piece 268, heat equalizer 269 twined with electric heating wire 265, liquid container 261 inside which liquid-storing media 264 being filled with liquids is inserted, and an atomizer cap 262 with an air-puffing hole in the center. Between the liquid container 261 and the liquid media 264 there preferably is a side-space for airflow. The second electric connector 267 may be inserted inside the atomizer tube 264.

The atomizer tube 263 is preferably made of a metallic or plastic material. The liquid-storing media 264 is preferably made of specially-designed cotton, while the supporting piece 268 is preferably made of a ceramic or plastic material in the shape of a cylinder or another configuration, which may be able to sustain a high temperature up to 1000 degrees centigrade. The heat equalizer 269 is preferably made of a special fiber which can withstand temperature as high as 2000 degrees centigrade. The electric heating wire 265 twined on the heat equalizer 269 can be made from tungsten or another electric heating material, which produces heat when the electric current flows therethrough. The two ends of the electric heating wire 265 are going through the small holes of the supporting piece 268 and connected to the second electric connector 267 to supply heat for atomization or vaporization of the liquid inside the liquid-storing media 264.

Figure 3 is a section view of another integrated electronic atomizer with the second electric connector 21 being of a DC plug-socket type. The electronic atomizer includes an atomizer tube 263 and, inside the atomizer tube 263, a second electric connector comprised of a DC plug 21 located on a plug seat 71, leak-proof piece 23, seal

washer 251, supporting piece 268, heat equalizer 269 twined with an electric heating wire 265, liquid container 261 inside which liquid-storing media 264 being filled with liquids is inserted, and an air-puffing hole in the center of one end of the atomizer tube 263. In Figure 3, the air-puffing hole is placed atop the atomizer tube 263.

Figure 4 is a section view of one electronic inhaler having a first electric connector of a screw thread type. The electronic inhaler includes an inhaler tube 10, cigarette cap 13 with small holes for air inflow, LED indicator 12, electric power source 5, annular tube 16 with its cap 15, integrated circuit board with a CPU processor 14, electric airflow sensor 6, sensor supporter 61, and first electric connector 17 with an inserted rush pith 11 surrounded by a silica-gel insulator 18.

The electric power source 5 connects to the circuit board 14, which connects to the first electric connector 17 and the electric airflow sensor 6. The LED 12 is connected to both electric power source 5 and the circuit board 14. The electric airflow sensor 6 is assembled onto the sensor supporter 61. The first electric connector 17 with an outskirt screw thread is partially embedded in the inhaler tube 10, which can be connected to the second electric connector of the electric atomizer to form an electronic cigarette.

The inhaler tube 10 is made of either a metal or a plastic. The electric power source 5 may be a battery of rechargeable or non-rechargeable type. The first electric connector is generally made of copper or another metal conductor.

Figure 5 is a section view of another electronic inhaler having a first electric connector 17 of a DC plug-socket type. The electronic inhaler includes an inhaler tube 10, cigarette cap 13 with small holes for air inflow, LED indicator 12, electric power source 5, seal piece 25, sensor supporter 61, electric airflow sensor 6, integrated circuit board with a CPU processor 14, and the first electric connector 17 located on the DC socket seat 28.

The electric power source 5 connects to the circuit board 14, which connects to the first electric connector 17 and the electric airflow sensor 6. The LED 12 is connected

to both electric power source 5 and the circuit board 14. The electric airflow sensor 6 is assembled onto the sensor supporter 61. The first electric connector 17 with the socket seat 28 is completely embedded in the inhaler tube 10, which can be connected to the second electric connector of the electric atomizer to form an electronic cigarette.

The inhaler tube 10 is made of either a metal or a plastic. The electric power source 5 may be a battery of rechargeable or non-rechargeable type. The first electric connector is generally made of copper or another metal conductor.

Figure 6 is a section view of one electronic cigarette when the electronic inhaler and electronic atomizer are connected via their respective electric connectors of the screw thread type. The electronic inhaler and the integrated electronic atomizer are fit together through their connectors of the same type to form the electronic cigarette. The connection is done via the first electric connector 17 of the electronic inhaler and the second electric connector 267 of the integrated electronic atomizer. The connection achieves the electric combination of the inhaler tube and the atomizer tube, each of which has a circular cross section in this embodiment, wherein the diameter is the inhaler is the same as or similar to that of the atomize. The user puffs on the end of the electronic cigarette with the air-puffing hole to activate the CPU processor through detection of an airflow signal and generate an electric current flowing through the electric heating wire, which achieves vaporization of the solution inside the liquid container.

Figure 7 is a section view of another electronic cigarette when the electronic inhaler and electronic atomizer are connected via the electric connectors of the DC plug-socket type. The electronic inhaler and the integrated electronic atomizer are fit together through their connectors of the same type to form the electronic cigarette. The connection is done through the first electric connector socket 28 of the electronic inhaler and the second electric connector plug 21 of the integrated electronic atomizer. The connection achieves the electric combination of the inhaler tube and the atomizer tube, each of which has a circular cross section in this embodiment, wherein the diameter is the inhaler is the same as or similar to that of the atomizer. The user puffs on the end of the

electronic cigarette with the air-puffing hole to activate the CPU processor through detection of an airflow signal and generate an electric current flowing through the electric heating wire, which achieves vaporization of the solution inside the liquid container.

CLAIMS:

1. An electronic cigarette comprises a tubular electronic inhaler and a tubular electronic atomizer, wherein the electronic inhaler includes an electric power source that provides an electric current to the electronic atomizer.

2. The electronic cigarette of claim 1, further comprising an integrated circuit board that has a Single Chip Micyoco that controls atomization of a liquid solution.

3. The electronic cigarette of claim 1, further comprising an electric airflow censor that is used to turn on and off the electric power source by way of detecting an airflow and sending a signal to the Single Chip Micyoco, wherein the Single Chip Micyoco receives the signal from the electric airflow sensor, instructs the electric power source to send an electric current to the electronic atomizer, a time period and a magnitude of the electric current.

4. The electronic cigarette of claim 3, wherein the electric airflow censor is a diaphragm microphone.

5. The electronic cigarette of claim 3, further comprising an LED indicator inside the electronic inhaler, wherein the LED indicator is connected to the Single Chip Micyoco and the electric power source, and wherein the on time of the LED indicator is controlled by the Single Chip Micyoco.

6. The electronic cigarette of claim 1, wherein the electronic inhaler includes, sequentially from a first end of the electronic inhaler to the second end, a cigarette cap, an LED indicator, the electric power source, an electric airflow sensor, a circuit board for a Single Chip Micyoco, and a first electric connector.

7. The electronic cigarette of claim 1, wherein the electronic inhaler includes a first electric connector disposed at a second end of the electronic inhaler, wherein the

electronic atomizer includes a second electric connector disposed at a first end of the electronic atomizer, and wherein the first electric connector is connected to the second electric connector so that the electronic inhaler and the electronic atomizer form the electronic cigarette.

8. The electronic cigarette of claim 1, wherein the electronic atomizer includes a liquid container having a side-space for airflow, wherein the liquid container includes a medium being socked with a solution to be atomized, and wherein the liquid container prevents or reduces liquid leak and reverse flow.

9. The electronic cigarette of claim 8, wherein the electronic atomizer includes an electric heating wire which generates heat for atomization of the solution socked in the medium inside the liquid container, a heat equalizer onto which the electric heating wire is wired and is made of inorganic fibers that can withstand a temperature up to 2000 degrees centigrade, wherein the heat equalizer ensures that the heat generated by the electric wire is uniform, and a supporting piece that is disposed next to the heat equalizer and is made of a plastic or ceramic material that can withstand a temperature up to 2000 degrees centigrade.

10. The electronic cigarette of claim 9, wherein the electronic atomizer includes a leak-proof member, wherein the leak-proof member and the second electric connector are closer to the first end of the electronic atomizer than the heat equalizer.

11. The electronic cigarette of claim 1, wherein the electronic atomizer includes, in sequence, a second electric connector, a leaf-proof piece, a supporting piece, a heat equalizer coupled with an electric heating wire, a fluid container filled with a medium, and an atomizer cap with an air-puffing hole.

12. The electronic cigarette of claim 1, wherein the electric power source is inside the electronic inhaler.

13. The electronic cigarette of claim 10, where the first electric connector is a DC socket and the second electric connector is a DC plug, wherein the DC plug is embedded onto the leak-proof piece through a plug seat, which is connected to the electric heating wire, and wherein the first end of the electronic atomizer is connected to the second of the electronic inhaler by placing the DC plug to the DC socket.

14. The electronic cigarette of claim 13, wherein the first electric connector is a cylinder terminal, and its outskirt is tightly embedded into the second end of the electric inhaler tube and its exposed portion has a screw thread, wherein the second electric connector is a cylinder terminal, which is tightly embedded into the first end of the electronic atomizer and has a screw thread inside the inhaler tube, and wherein the fist electric connector and second electric connector are connected through the screw threads.

Abstract of the Disclosure

An electronic cigarette has two tubes that resemble a cigarette: an electronic inhaler and an electronic atomizer. The two tubes are connected through one or more electric connectors to form an electronic cigarette. Inside the inhaler is a rechargeable or non-rechargeable power source such as a battery, which supplies electric power to the electronic inhaler and atomizer and ensures that both work together like a cigarette. In addition to the power source, the inhaler also includes other major components: an electric airflow sensor to detect air movement generated by a user's inhaling or puffing act and a Single Chip Micyoco which controls the atomization process. The sensor's role is to collect an airflow signal that triggers the Single Chip Micyoco, which in turn instructs the electronic cigarette to supply electric power to the inhaler and atomizer connected through an electric connector. Inside the electronic atomizer are an electric connector, electric heating wire, liquid container, and atomizer cap with an air-puffing hole. The user inhales through the air-puffing hole at an end of the electronic cigarette to create an air inflow, which triggers the atomization process. The Single Chip Micyoco driven by a software program controls the electronic cigarette in an on/off manner according to the signal detected by the electric sensor on the airflow and completes a cycle of atomization, which converts a solution of a liquid form inside the liquid container to a gas form. This entire process achieves the emulated smoking process of a user, who is satisfied with scent taste that mimics cigarette smoking.

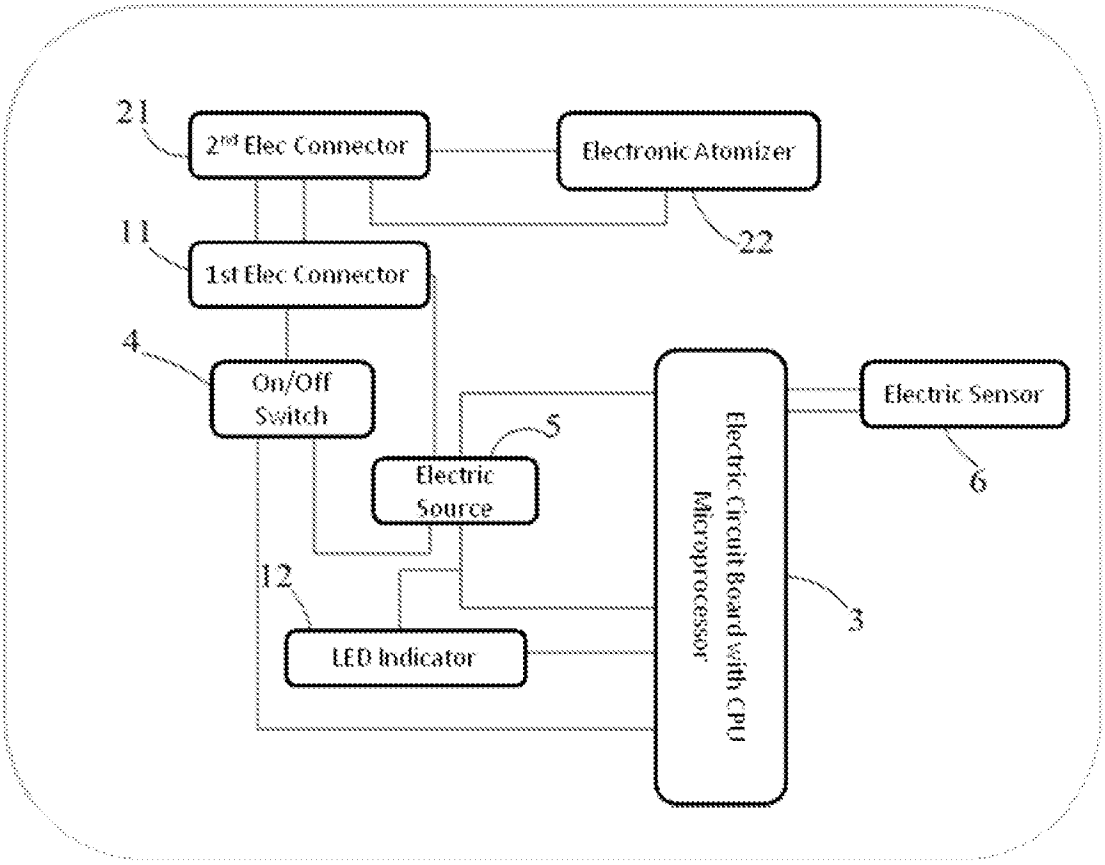

Figure 1

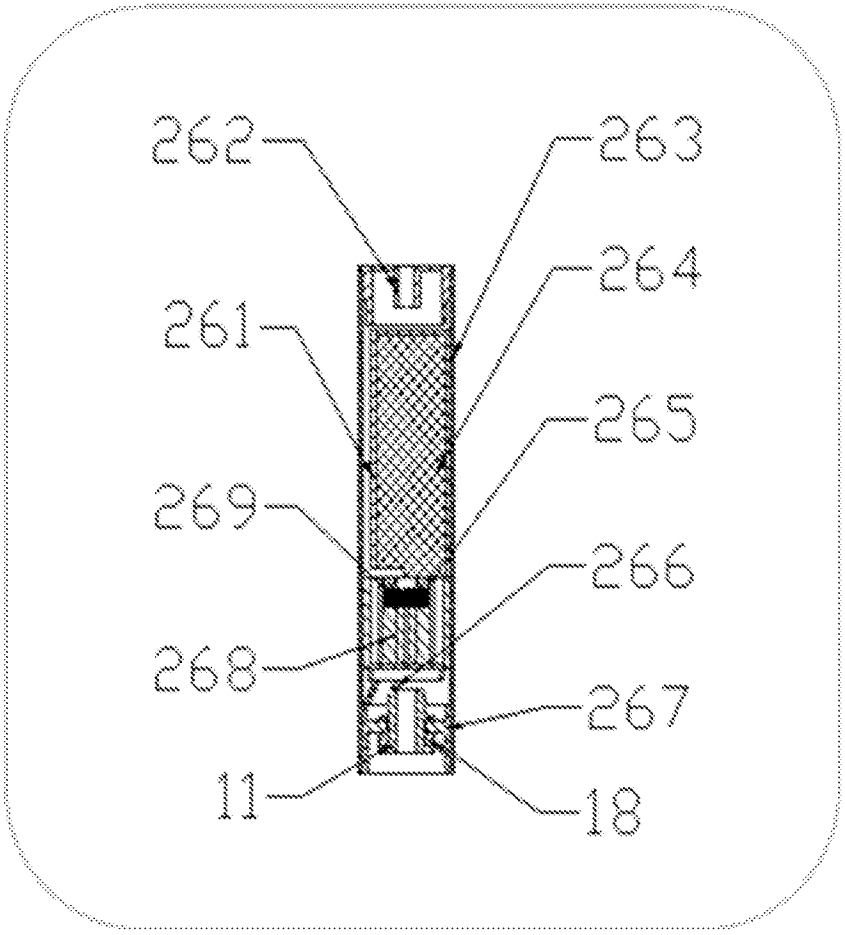

Figure 2

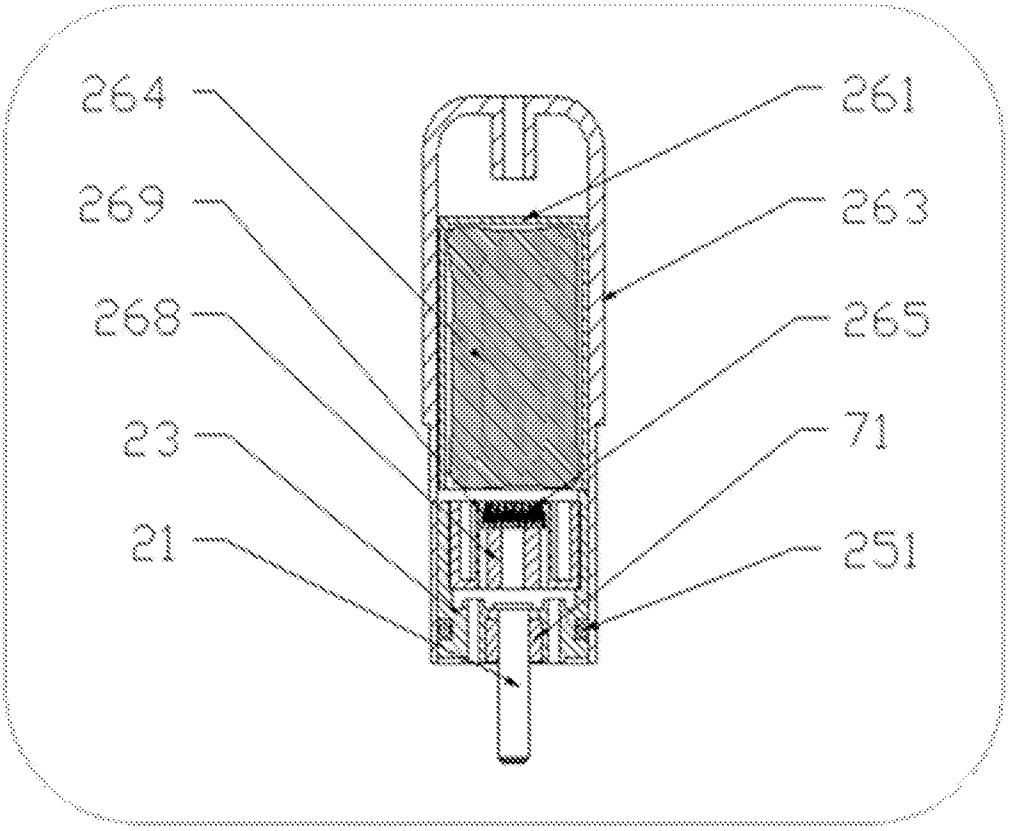

Figure 3

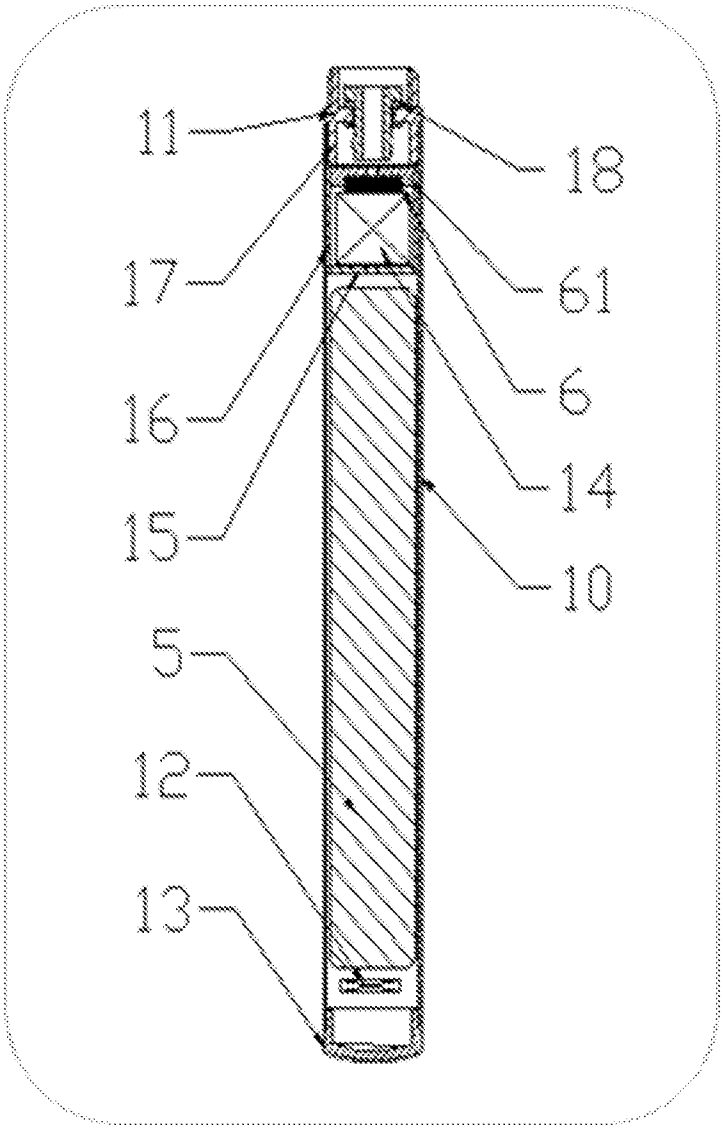

Figure 4

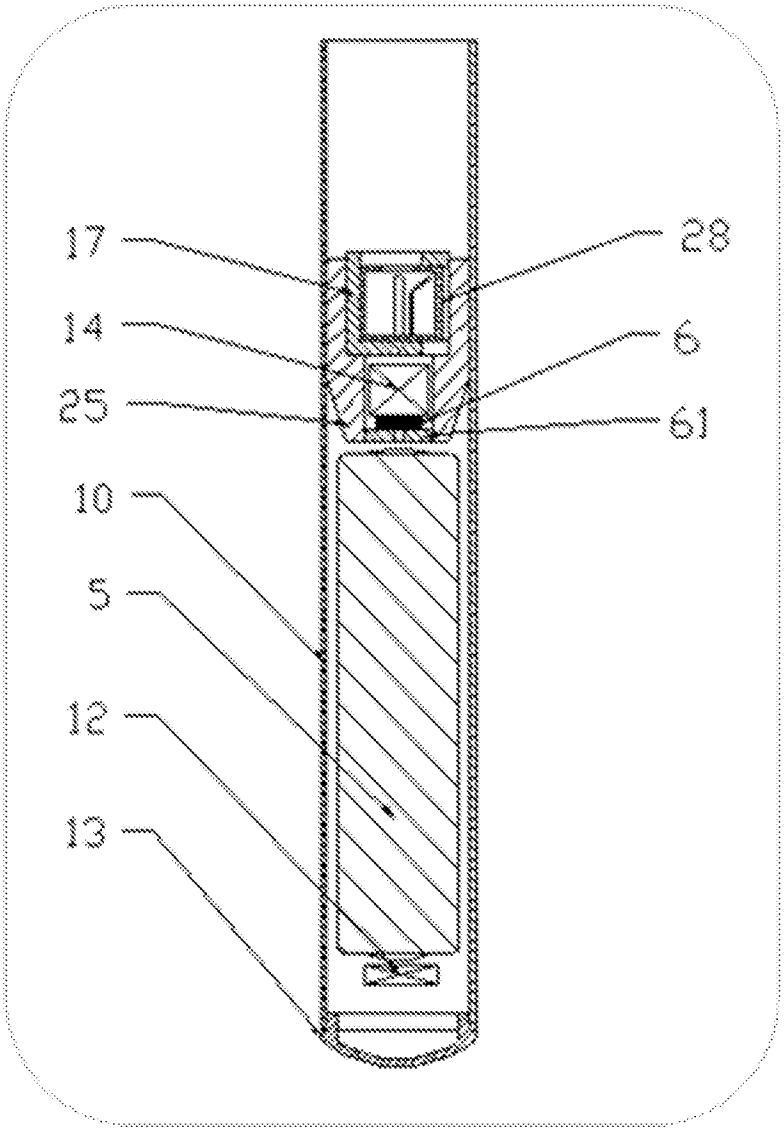

Figure 5

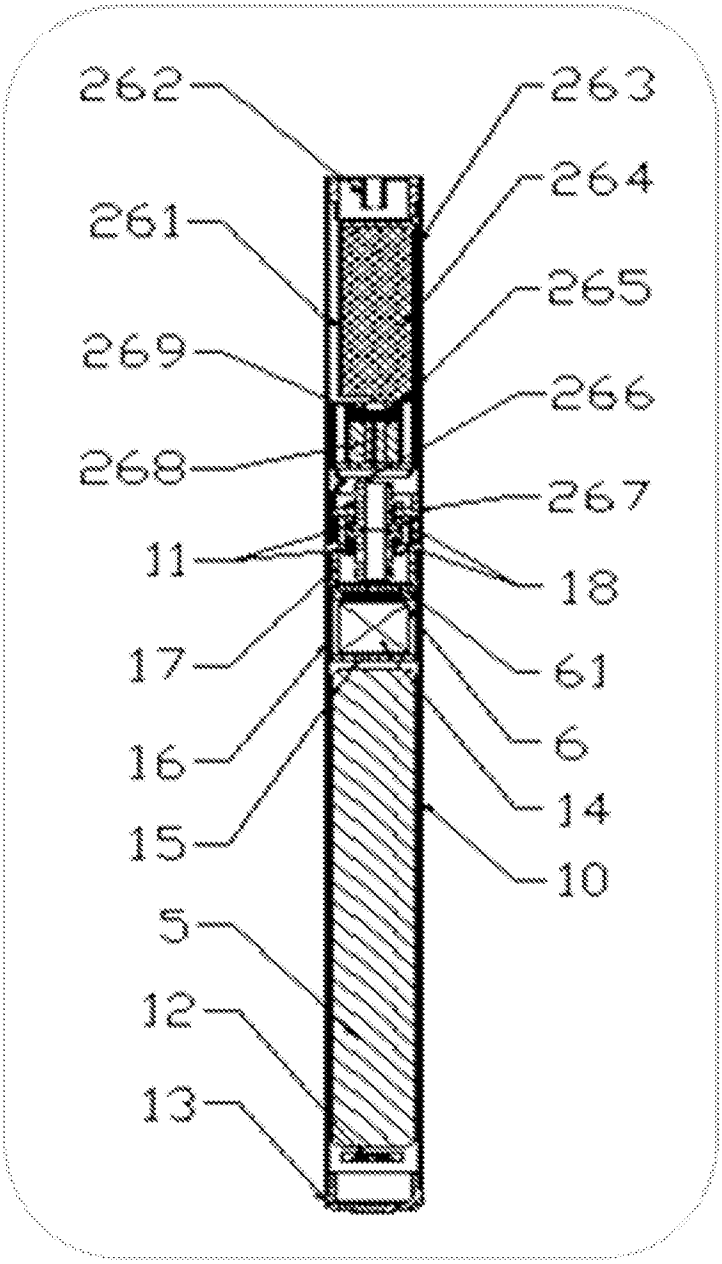

Figure 6

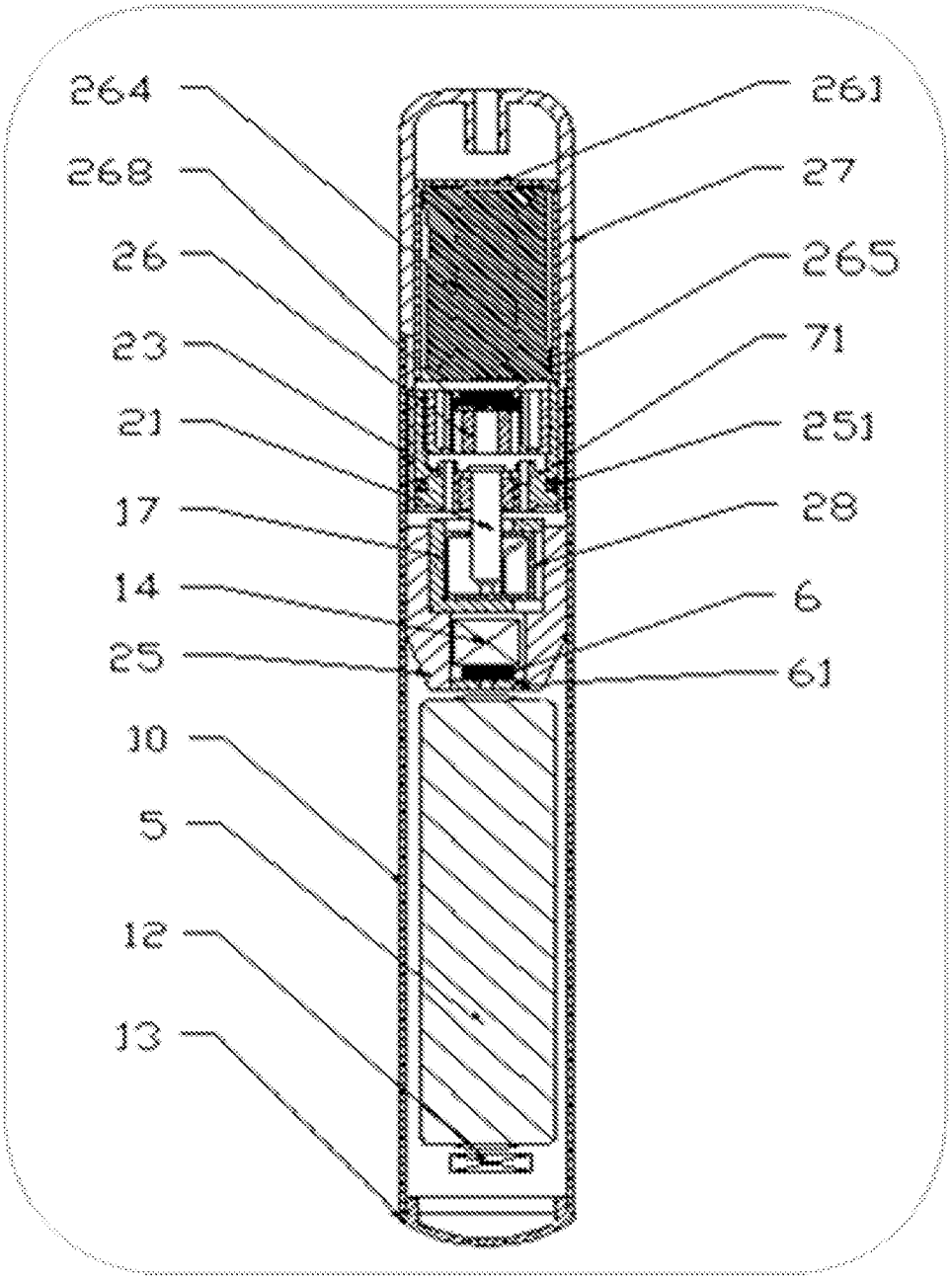

Figure 7

COMBINED DECLARATION FOR PATENT APPLICATION & POWER OF ATTORNEY	DOCKET NO: 104372.00002

As a below named inventor, I hereby declare that:

The information given herein is true;

My residence, post office address and citizenship are as stated below next to my name;
I BELIEVE I AM THE ORIGINAL, FIRST AND SOLE INVENTOR (if only one name is listed below) OR AN ORIGINAL, FIRST AND JOINT INVENTOR (if plural names are listed below) OF THE SUBJECT MATTER WHICH IS CLAIMED AND FOR WHICH A PATENT IS SOUGHT ON THE INVENTION ENTITLED:

ELECTRONIC CIGARETTE

the specification of which (check only one item below):

☒ is attached hereto;

☐ was filed on as United States Application Serial No. and was amended on

☐ was filed on _____ as PCT International Application Serial No. and was amended under PCT Article 19 _____ (if applicable).

I hereby state that I have reviewed and understand the content of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations Section 1.56.

I hereby claim the benefit under Title 35, United States, §119(e) of any United States provisional application(s) listed below.

_____ (Application Serial No.)	_____ (Filing Date)

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119 (a)-(d) or §365(b) of any foreign application(s) for patent or inventor's certificate, or §365(a) of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America having a filing date before that of the application(s) on which priority is claimed.

FOREIGN APPLICATION(S), IF ANY, FILED WITHIN 12 (6 if a Design) MONTHS PRIOR TO THE FILING DATE OF THIS APPLICATION THE PRIORITY OF WHICH WHERE PERMITTED IS HEREBY CLAIMED UNDER 35 U.S.C. SEC. 119.

COUNTRY	APPLICATION OF NUMBER	DATE OF FILING (day, month, year)	DATE OF ISSUE (day, month, year)	PRIORITY CLAIMED	
CHINA	200910080147.5	24/03/2009		YES	

I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s) or PCT international application(s) designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of Title 35, United States Code, Section 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, Section 1.56(a) which occurred between the filing date of the prior application(s) and the national or PCT international filing date of this application.

COMBINED DECLARATION FOR PATENT APPLICATION & POWER OF ATTORNEY – Continued			ATTORNEY'S DOCKET NO: **104372.00002**	
U.S. APPLICATION NO.	U.S. FILING DATE	PATENTED	PENDING	ABANDONED
PCT APPLICATIONS DESIGNATING THE U.S.				
PCT APPLICATION NO.	PCT FILING DATE	U.S. SERIAL NUMBERS		

POWER OF ATTORNEY: As a named inventor, I hereby appoint practitioners associated with the Customer Number:

44955

As my/our attorneys or agents to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

Send correspondence to	Song Zhu Squire, Sanders & Dempsey L.L.P. One Maritime Plaza, Suite 300 San Francisco, CA 94111	Direct Phone Calls To: Song Zhu: 415-954-0241

1	FULL NAME OF INVENTOR	LAST NAME Pan	FIRST NAME Guocheng	MIDDLE NAME	
	RESIDENCE & CITIZENSHIP	CITY Cupertino	STATE OR FOREIGN COUNTRY California	COUNTRY OF CITIZENSHIP USA	
	POST OFFICE ADDRESS	STREET 10580 White Fir Ct.	CITY Cupertino	STATE OR COUNTRY CA	ZIP CODE 95014

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Signature Of Inventor 1

Guocheng Pan

Date _May 5, 2009_

SCORE Placeholder Sheet for IFW Content

Application Number: 12437511 Document Date: 5/7/2009

The presence of this form in the IFW record indicates that the following document type was received in electronic format on the date identified above. This content is stored in the SCORE database.

- Drawings – Other than Black and White Line Drawings

Since this was an electronic submission, there is no physical artifact folder, no artifact folder is recorded in PALM, and no paper documents or physical media exist. The TIFF images in the IFW record were created from the original documents that are stored in SCORE.

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Form Revision Date: February 8, 2006

Filing Date: **05/07/09**

Approved for use through 7/31/2006. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 12/437,511

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	**82**		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	**270**		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	**110**		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	**14** minus 20 =		x$26		OR	x$52	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	**1** minus 3 =	*	x$110			x$220	
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $270 ($135 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR						
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))			195			390	
			TOTAL	**462**		TOTAL	

* If the difference in column 1 is less than zero, enter "0" in column 2.

APPLICATION AS AMENDED – PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					N/A		OR	N/A	
						TOTAL ADD'T FEE		OR	TOTAL ADD'T FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)	OR	RATE ($)	ADDITIONAL FEE ($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					N/A		OR	N/A	
						TOTAL ADD'T FEE		OR	TOTAL ADD'T FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
12/437,511	05/07/2009	1791	462	104372.00002	14	1

CONFIRMATION NO. 7646

44955
SQUIRE, SANDERS & DEMPSEY L.L.P.
1 MARITIME PLAZA, SUITE 300
SAN FRANCISCO, CA 94111

FILING RECEIPT

OC000000036012001

Date Mailed: 05/22/2009

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Applicant(s)

Guocheng Pan, Cupertino, CA;

Power of Attorney: The patent practitioners associated with Customer Number 44955

Domestic Priority data as claimed by applicant

Foreign Applications

CHINA 200910080147.5 03/24/2009

If Required, Foreign Filing License Granted: 05/15/2009

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 12/437,511**

Projected Publication Date: 09/30/2010

Non-Publication Request: No

Early Publication Request: No
** **SMALL ENTITY** **

Title

Electronic Cigarette

Preliminary Class

131

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

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Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

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STATE INTELLECTUAL PROPERTY OFFICE
OF THE PEOPLE'S REPUBLIC OF CHINA

证　　明

本证明之附件是向本局提交的下列专利申请副本

申　　请　　日：2009.03.24

申　　请　　号：200910080147.5

申　请　类　别：发明专利

发明创造名称：高仿真电子烟

申　　请　　人：北京格林世界科技发展有限公司

发明人或设计人：潘国成

中华人民共和国
国家知识产权局局长 田力普

2009 年 5 月 8 日

VPR - 000047

09·03·26

权　利　要　求　书

1、一种高仿真电子烟，其包括：一香烟形外壳，在所述的外壳内设置有电源、电子雾化器以及电子吸入器，其中，所述的电源提供给所述的电子雾化器雾化的电流；其特征在于，还包括：一电子传感器，其用以传感用户的吸气动作，并产生一与吸气气流大小相对应的触发信号唤醒一CPU处理器工作；

所述的CPU处理器接收到所述的电子传感器的触发信号，根据触发信号的大小通过其内储存的智能程序，控制电子开关调整电路输出电流的大小，向所述的电子雾化器供电。

2、根据权利要求 1 所述的高仿真电子烟，其特征在于，所述的香烟外壳内部还设有一 LED 指示灯，其分别与所述的处理器和电源相连接，所述 LED 指示灯的亮度与触发信号的大小相对应。

3、根据权利要求 2 所述的高仿真电子烟，其特征在于，所述的香烟形外壳由两部分组成，分别为电子雾化器前端外壳和电子吸入器后端外壳，其中，在所述的电子吸入器后端外壳内由前至后端依序装有烟帽、所述的 LED 指示灯、所述的电源、装设有所述电子传感器和 CPU 处理器的电路板以及一第一电连接件，所述的电源通过一电子开关与所述的第一电连接件相连。

4、根据权利要求 3 所述的高仿真电子烟，其特征在于，所述的电子雾化器前端外壳内部设置有第二电连接件以及所述电子雾化器，其中，所述的第一电连接件与所述的第二电连接件电连接，所述的第二电连接件和所述电子雾化器电连接。

5、根据权利要求 4 所述的高仿真电子烟，其特征在于，所述的电子雾化器包括：

雾化器壳体；

雾化器嵌件，其设置于所述的雾化器壳体内，所述的雾化器嵌件内部通过储液媒介吸附或储存将被雾化的烟液；

液体雾化组件，其与所述的第二电连接件电连接，所述的液体雾化组件内部设置有通气孔，用以通电加热产生雾化现象；

电子雾化器上盖，其嵌入所述的雾化器壳体上端，所述的电子雾化器上盖具有一通气孔，用以密封并防止烟液回流。

6、根据权利要求 5 所述的高仿真电子烟，其特征在于，所述的液体雾化组

件包括；

发热件，其用以产生热量，所述的发热件为钨丝；

热量均匀件，其用以将发热件产生的热量均匀化，其中，所述的发热件设置于所述的热量均匀件内，所述的热量均匀件为 100 度至 3000 度耐高温材料制成，它与所述的雾化器壳体内部配合；

发热件支撑体，其套设在所述的发热件内，所述的发热支撑体为 100 度至 3000 度有机或无机耐高温材料制成。

7、根据权利要求 5 或 6 所述的高仿真电子烟，其特征在于，还包括：一防漏件，所述的液体雾化组件设置于所述的防漏件内，且所述的防漏件与所述的雾化器壳体通过密封配合。

8、根据权利要求 7 所述的高仿真电子烟，其特征在于，所述的第一电连接件为一插座，所述的第二电连接件为一插头，其中，所述的插头通过一插头座嵌入到所述的防漏件中，所述的插头座与所述的发热件电连接；所述的插座与插头相插接，同时所述的电子雾化器前端外壳和电子吸入器后端外壳连接成一整体。

9、根据权利要求 4、5 或 6 所述的高仿真电子烟，其特征在于，所述的第一电连接件为一下端子，其为一圆柱形接线端子，所述的下端子一部分外缘嵌入到所述的电子吸入器后端外壳内实现紧配合，外露的一部分外缘设有外螺纹；

所述的第二电连接件为一上端子，其为一圆柱形接线端子，所述的上端子与所述的电子雾化器前端外壳内壁紧配合，内部设有内螺纹；

所述的下端子与所述的上端子螺纹连接，同时所述的电子雾化器前端外壳和电子吸入器后端连接成一整体。

10、根据权利要求 7 所述的高仿真电子烟，其特征在于，所述的第一电连接件为一插头，所述的第二电连接件为一插座，其中，所述的插座嵌入到所述的防漏件中，并与所述的发热件电连接；所述的插座与插头相插接，同时所述的电子雾化器前端外壳和电子吸入器后端外壳连接成一整体。

11、根据权利要求 4、5 或 6 所述的高仿真电子烟，其特征在于，所述的第一电连接件为一下端子，其为一圆柱形接线端子，所述的下端子与所述的电子雾化器前端外壳下端内壁紧配合，所述的下端子内部设有内螺纹；

所述的第二电连接件为一上端子，其为一圆柱形接线端子，所述的上端子一部分外缘嵌入到所述的电子吸入器后端外壳内实现紧配合，外露的一部分外

缘设有外螺纹；

所述的下端子与所述的上端子螺纹连接，同时所述的电子雾化器前端外壳和电子吸入器后端连接成一整体。

说　明　书

高仿真电子烟

技术领域

本发明涉及的是一种电子烟，特别是涉及一种具有保健功能的高仿真电子香烟。

背景技术

香烟的有效成分是烟碱（即尼古丁），吸烟时，烟碱随着香烟燃烧时产生的大量焦油雾滴进入肺泡后迅速吸收作用于中枢神经系统的受体上，引起类似兴奋剂的“陶醉感”起到提神的作用。烟碱是小分子生物碱在血液中的半衰期极短，在小剂量下对人体基本无害。烟草的有害物质主要是焦油及烟草燃烧时产生的上千种有害成分其中有数十种成分是致癌物。香烟燃烧时产生的二手烟对人体危害更大。由于吸烟有害健康污染环境，随着科技发展，近年来许多减害的香烟替代产品应运而生。

例如日本专利文件特开平 3－232481 号公报，提出有一种在绝热管内设置加热组件和固体香味发生介质，通过把该绝热管和加热组件的电源用包装纸包装而形成香烟状的模拟烟具的提案。这种结构的模拟烟具，通过由电源把电能供给加热组件，使香味发生介质加热并生成香味成分，并通过吸入该香味成分和被吸入到模拟烟具内的空气的混合气，从而可达到满足香烟味道嗜好者的嗜好的效果。

然而，对于这种结构的模拟烟具，由于使香味发生介质升温要花时间，因而在香味发生介质生成足够量的香味成分之前需要等待一段时间，在模拟吸烟开始时得不到足够量的香味成分，模拟吸烟开始时得不到与吸真正的香烟相同的感觉。并且，由于不能对香味发生介质生成的香味成分的量进行高精度控制，因而不能根据吸入量来调整香味成分的量，得不到与吸真正的香烟相同的感觉。

而且，由于不具备发生与香烟相同的烟的功能和发生与香烟相同的火种的功能，因而总是觉得不像是在吸烟。

中国专利申请号为 03111582.9 的专利“一种非可燃性电子喷雾香烟”提供了

一种具有戒烟和香烟代用品作用的非可燃性电子喷雾香烟。该种香烟包括壳体、电池、高频发生器、烟碱贮液及容器、控制电路，显示屏、电子感应器、人体接触传感器、压电超声雾化器、高温气化喷管，此外还包括电控泵或连有计量腔的阀，单向注液阀等部件。此种电子香烟结构复杂，造价高，不利于推广使用。

中国专利 ZL200410048792.6 名称为“电子香烟”，公开了一种电子香烟，其具有：壳体，具有吸烟口，整体形状形成大致棒状；喷出装置，设置在上述壳体内，具有至少 1 个通过驱动致动器以改变充填有液态香味生成介质的腔内的压力，来把上述香味生成介质以液滴的状态从与上述腔连通的喷嘴的喷头喷出；以及控制装置，设置在上述壳体内，控制上述喷出装置的驱动；检测装置，用于检测上述壳体内流通的风量；以及烟发生装置，从上述壳体的前端部发生模拟烟；上述控制装置根据上述检测装置的检测结果控制上述烟发生装置的驱动。

这样，通过使用控制装置驱动喷出装置，把香味生成介质的液滴喷出到壳体内，并把香味成分供给到壳体内，其还包括：一雾化装置，设置在上述壳体内，使从上述喷出装置喷出的香味生成介质的液滴雾化。

这样，依靠喷出装置的驱动而喷出到壳体内的香味生成介质的液滴由雾化装置来雾化（细微化）。然后，通过在该状态下把壳体的吸烟口侧衔在口中吸气，使流入到壳体内的空气和壳体内的雾状香味成分的混合气流入到口内，香味成分在口内扩散，从而能够达到满足香烟味道嗜好者的嗜好的效果。

但是其仍有不足之处如下：

现有的电子烟存在烟液渗漏、回流、烟液暴露、断雾、吸力大、用户吸用的轻松程度和雾化量都与香烟相差甚远,当烟液耗尽需更换时，造成液体外露，不安全、不卫生且更换过程繁琐操做复杂等问题。

现有的电子烟都存在雾化装置太复杂，当吸入使用一定口数后雾化器很快老化不能更换,导致雾化量明显下降，出现断雾、不雾化等现象直接影响到电子烟寿命。

现有的电子烟核心技术工作电源的开、关控制仍停止在机械阶段，自身功能受外界环境、温度、湿度等影响致使产品性能、功能不稳定，并造成断雾、吸力大、使用寿命短等致命问题。

现有的电子烟充电时需要取下烟杆内电池外接充电，且充电接口必须配套，造成使用不便等问题。

鉴于上述缺陷，本发明创作者经过长时间的研究和实践终于获得了本创作。

发明内容

本发明的目的在于，提供一种高仿真电子烟，用以克服上述的缺陷。

本发明的采用的技术方案在于，提供一种高仿真电子烟，其包括：一香烟形外壳，在所述的外壳内设置有电源、电子雾化器以及电子吸入器。其中，所述的电源提供给所述的电子雾化器雾化的电流；其中，还包括：一电子传感器，其用以传感用户的吸气动作，并产生一与所述气流大小相对应的触发信号；

一CPU处理器，其接收到所述的电子传感器的触发信号根据触发信号的大小通过其内储存的智能程序，控制电子开关调整电路输出电流的大小，向所述的电子雾化器供电工作。

较佳的，所述的香烟外壳内部还设有一 LED 指示灯，其分别与所述的处理器和电源相连接，所述 LED 指示灯的亮度与触发信号的大小相对应。

其中，所述的香烟形外壳由两部分组成，分别为电子雾化器前端外壳和电子吸入器后端外壳，其中，在所述的电子吸入器后端外壳内由前至后端依序装有烟帽、所述的 LED 指示灯、所述的电源、装设有所述电子感应器和 CPU 处理器的电路板以及一第一电连接件，所述的电源通过一电子开关与所述的第一电连接件相连。

其中，所述的电子雾化器前端外壳内部设置有第二电连接件以及所述电子雾化器，其中，所述的第一电连接件与所述的第二电连接件电连接，所述的第二电连接件和所述电子雾化器电连接。

其中，所述的电子雾化器包括：

雾化器壳体；

雾化器嵌件，其设置于所述的雾化器壳体内，所述的雾化器嵌件内部通过储液媒介吸附或储存将被雾化的烟液；

液体雾化组件，其与所述的第二电连接件电连接，所述的液体雾化组件内部设置有通气孔，用以通电加热产生雾化现象；

电子雾化器上盖，其嵌入所述的雾化器壳体上端，所述的电子雾化器上盖具有一通气孔，用以密封并防止烟液回流。

较佳的，所述的液体雾化组件包括：发热件，其用以产生热量，所述的发热件为钨丝；

热量均匀件，其用以将发热件产生的热量均匀化，其中，所述的发热件设置于所述的热量均匀件内，所述的热量均匀件为 100 度至 3000 度耐高温材料制成，它与所述的雾化器壳体内部配合；

发热件支撑体，其作为支撑套设在所述的发热件内，所述的发热支撑体为 100 度至 3000 度有机或无机耐高温材料制成。

较佳的，还包括：一防漏件，所述的液体雾化组件设置于所述的防漏件内，且所述的防漏件与所述的雾化器壳体通过密封结合。

对于第一电连接件和第二电连接件存在两种结合方式，其中，第一种为所述的第一电连接件为一插座，所述的第二电连接件为一插头，其中，所述的插头通过一插头座嵌入到所述的防漏件中，所述的插座嵌入在一密封件内与电子吸入器壳体后端紧密配合。所述的插头座与所述的发热件电连接；所述的插座与插头相插接，同时所述的电子雾化器前端外壳和电子吸入器后端外壳连接成一整体。

第二种为，所述的第一电连接件为一下端子，其为一圆柱形接线端子，所述的下端子一部分外缘嵌入到所述的电子吸入器后端外壳内实现紧配合，外露的一部分外缘设有外螺纹；

所述的第二电连接件为一上端子，其为一圆柱形接线端子，所述的上端子与所述的电子雾化器前端外壳内壁紧配合，所述的上端子内部设有内螺纹；

所述的下端子与所述的上端子螺纹连接，同时所述的电子雾化器前端外壳和电子吸入器后端连接成一整体。

同时这种结合关系对应的客体可以对调，所述的第一电连接件为一插头，所述的第二电连接件为一插座，其中，所述的插座嵌入到所述的防漏件中，并与所述的发热件电连接；所述的插座与插头相插接，同时所述的电子雾化器前端外壳和电子吸入器后端外壳连接成一整体。或者，所述的第一电吸入器电与第二电雾化器电通过导线直接连接，将电子雾化器和电子吸入器在同一杆体内连成一整体。

与现有技术比较本发明的有益效果在于，产品功能性能稳定，一致性好，吸用轻松，不断雾，使用寿命长，质量有保证；同时解决了现有技术存在的烟液渗漏、回流、烟液外露问题，保证了安全、卫生、方便，解决了雾化器老化问题。

附图说明

图 1 为本发明高仿真电子烟的核心控制部分的电路结构示意图；

图 2 为本发明高仿真电子烟实施例一的电子雾化器前端结构剖视简图；

图 3 为本发明高仿真电子烟实施例一电子雾化器的剖视图；

图 4 为本发明高仿真电子烟实施例一的安装后的结构剖视简图；

图 5 为本发明高仿真电子烟实施例二的电子吸入器后端结构剖视简图；

图 6 为本发明高仿真电子烟防漏件与发热支撑件结合后的结构剖视简图；

图 7 为本发明高仿真电子烟实施例二的安装后的结构剖视简图。

具体实施方式

以下结合附图，对本发明上述的和另外的技术特征和优点作更详细的说明。

本发明高仿真电子烟包括：一香烟形外壳，在所述的外壳内设置有电源、电子雾化吸入器以及电子吸入器，所述的香烟形外壳由两部分组成，分别为电子雾化器前端外壳和电子吸入器后端外壳。

请参阅图 1 所示，其为本发明高仿真电子烟的核心控制部分的电路结构示意图；一电源 5 提供给所述的电子雾化器 22 加热的电流，同时也为其他用电的元器件供电，其中，所述的电源 5 通过一第一电连接件 11 和一第二电连接件 21 与所述的电子雾化器 22 相连接；一电子传感器 6，其用以传感用户的吸气动作，并产生一与吸气气流大小相对应的触发信号唤醒一 CPU 处理器 3 工作；

所述的 CPU 处理器 3 接收到所述的电子传感器 6 的触发信号根据触发信号的大小通过其内储存的智能程序，控制所述的电源 5 向所述的电子雾化器 22 供电，并根据触发信号的大小调整电源 5 输出电流的大小，这是通过一电子开关 4 实现的。所述的香烟外壳内部还设有一 LED 指示灯 12，其分别与所述的处理器 3 和电源 5 相连接，所述 LED 指示灯 12 的亮度与触发信号的大小相对应，从而形成本发明核心的功能过程，当用户吸气用力，则所述的电子传感器 6 产生的触发信号较大，从而所述的处理器 3 控制所述的电子开关 6 使所述的电源 5 输出的电流大小与所述的吸气气流大小相对应，从而控制电子雾化器 22 的加热程度以及 LED 指示灯 12 的亮度，进而营造成一个逼真的吸烟状态。

请参阅图 2 所示，其为本发明高仿真电子烟实施例一的电子雾化器前端结构剖视简图；在所述的电子雾化器前端外壳 10 内由前至后端依序装有烟帽 13、所述的 LED 指示灯 12、所述的电源 5、装设有所述电子传感器 6 和处理器 3 的电路板 14 以及一第一电连接件 11，所述的电源 5 通过一电子开关 4 与所述的第

一电连接件 11 相连，所述的电子传感器 6 装设在一感应器支架 61 上，所述的第一电连接件为一下端子 11，其为一圆柱形接线端子，所述的下端子 11 一部分外缘嵌入到所述的电子雾化器前端外壳 10 内实现紧配合，外露的一部分外缘设有外螺纹 17，用以和一具有内螺纹的结构结合在一起，实现整体的连接。

请参阅图 3 所示，其为本发明高仿真电子烟实施例一电子雾化器的剖视图；述的电子雾化器包括：雾化器壳体 263；所述的雾化器壳体 263 内包括：雾化器嵌件 261，其设置于所述的雾化器壳体 263 内，所述的雾化器嵌件 261 内部通过储液媒介 264 吸附或储存将被雾化的烟液；所述的储液媒介 264 对应材料的耐热温度为 100 度至 3000 度，其材料可以为纤维棉或其它组合，从而在所述的电子雾化器工作状态下，产生热量不至于将所述的储液媒介破坏。

液体雾化组件，用以通电后产生热量，从而作为产生雾化现象的热源，其通过导线 266 与所述的第二电连接件 267 电连接，其中，所述的液体雾化组件包括：一发热件 265，用以产生热量，其为耐高温材料即可以是钨丝；一热量均匀件 268，用以将发热件 265 的热量均匀化，所述的发热件 265 设置于所述的热量均匀件 268 内，所述的热量均匀件 268 为 100 度至 3000 度耐高温材料制成，其可以是罐装体也可以是圆柱体或其它，这里采用罐装体。还包括：一发热件支撑件 269，套设在所述的钨丝内，其用以起到支撑，与所述的热量均匀件 268 相固定作用，所述的发热件支撑件 269 是由 100 度至 3000 度耐高温有机材料或无机材料制成，这里采用高温丝，在所述的罐装体发热支撑件中间设置有通气孔。

电子雾化器上盖 262，其嵌入所述的雾化器壳体 263 上端，所述的电子雾化器上盖 262 具有一通气孔，用以密封并防止烟液回流。

所述的第二电连接件为一上端子 267，其为一圆柱形接线端子，所述的上端子与所述的电子吸入器后端外壳 263 下端内壁紧配合，所述的上端子 267 内部设有内螺纹；

所述的下端子 267 与所述的上端子 11 螺纹连接，同时所述的电子雾化器前端和电子吸入器后端连接成一整体。

这里需要强调的是由于采用了螺纹连接形式，因此在结合关系上对应的客体可以对调，位于所述的电子雾化器前端第一电连接件为一上端子，其与所述的电子雾化器前端外壳下端内壁紧配合，所述的上端子内部设有内螺纹；

位于所述的电子吸入器后端第二电连接件为一下端子，其一部分外缘嵌入

到所述的电子吸入器后端外壳内实现紧配合，外露的一部分外缘设有外螺纹；

所述的下端子与所述的上端子螺纹连接，同时所述的电子雾化器前端和电子吸入器后端连接成一整体。

请参阅图 4 所示，其为本发明高仿真电子烟实施例一的安装后的结构剖视简图；通过所述的上端子 11 内部设有内螺纹与所述下端子 267 外露的设有外螺纹相结合，从而实现所述的电子雾化器前端外壳和电子吸入器后端外壳之间结构的整体结合，内部实现电连接，最终形成一个完整的整体。

请参阅图 5 所示，其为本发明高仿真电子烟实施例二的电子吸入器后端结构剖视简图；其在所述的电子吸入器后端外壳内依次设置有防漏件 23、液体雾化组件，其中所述的防漏件 23 为导电材料制得，所述的电子吸入器后端外壳顶端设置有烟嘴，其中一直流插头 21 通过一插头座 24 与所述的防漏件 23 相结合，从而形成所述液体雾化组件中的发热件 265 电连接。

请结合图 6 所示，其为本发明高仿真电子烟防漏件与发热支撑件结合后的结构剖视简图，所述的防漏件 23 为一圆柱形两端开设有直径不同的罐状结构，并且其中央具有一个承载座，所述的液体雾化组件的热量均匀件 268 设置于所述的防漏件 23 内并抵靠在承载座上，所述的防漏件 23 前端中空部用以和直流插头座 24 相连接；壳体内部的器件与壳体之间要设置密封件进行密封处理，这对本领域技术人员而言是显然的，这里就不再赘述了。

请参阅图 7 所示，其为本发明高仿真电子烟实施例二的安装后的结构剖视简图；所述的电子雾化器前端外壳依次设置有烟帽 13、电源 10、电路板 14 以及一个直流插头 21，一插头座 24 嵌入到所述的防漏件 23 中，所述的插头座 24 与所述的发热件 265 电连接；所述的插座 28 与直流插头 21 相插接，同时所述的电子雾化器前端外壳和电子吸入器后端外壳连接成一整体。

需要强调的是这种结合关系对应的客体是可以对调的，位于所述的电子雾化器前端的第一电连接件可以为一直流插头 21，位于所述的电子吸入器后端的第二电连接件可以为一插座 28，其中，所述的插座 28 嵌入到所述的防漏件 23 中，并与所述的发热件 265 电连接；所述的插座 28 与直流插头 21 相插接，同时所述的电子雾化器前端外壳和电子吸入器后端外壳连接成一整体。

本发明将电子烟工作的核心技术及电路开、关等采用电子传感和 CPU 程序控制，简化了现有电子烟复杂的机械原理和繁琐的装配过程。真正做到了吸用轻松度、雾量大小和香烟相同。保证了产品的性能、功能稳定和使用寿命。

同时将电子烟雾化装置部分和电子吸入器控制电路部分进行分体设计。将储存烟液的容器和雾化烟液的雾化装置及通电电路一起装入电子雾化器中密封形成一体，防止了烟液的渗漏、回流及外露。当烟液耗尽后将一体式电子雾化器丢弃，更换新的一只即可重新使用从根本上解决了电子烟雾化装置老化的核心问题，延长了电子烟使用寿命。

综上，采用标准直流插头插入到插座中直接充电或将带有螺纹连接的电子雾化吸入器后端杆体产品拧入相应充电器充电，从而简化了充电过程。

以上所述仅为本发明的较佳实施例，对本发明而言仅仅是说明性的，而非限制性的。本专业技术人员理解，在本发明权利要求所限定的精神和范围内可对其进行许多改变，修改，甚至等效，但都将落入本发明的保护范围内。

说 明 书 附 图

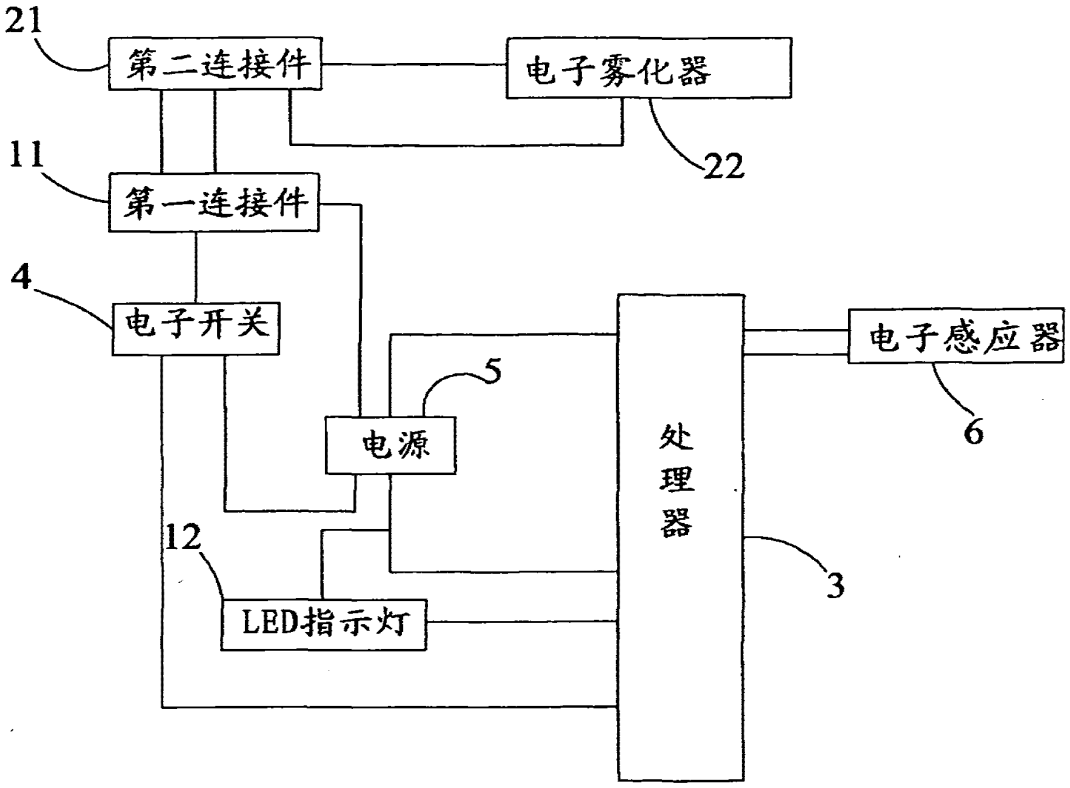

图 1

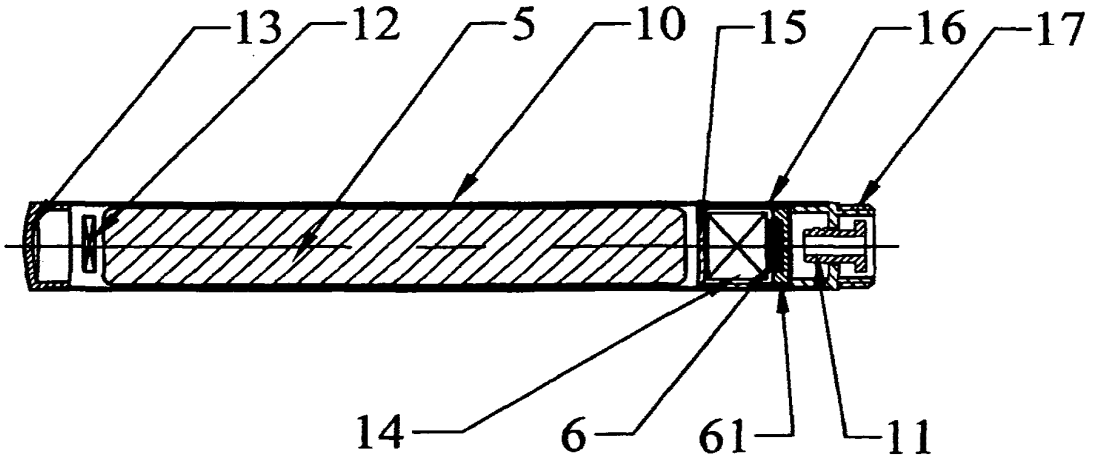

图 2

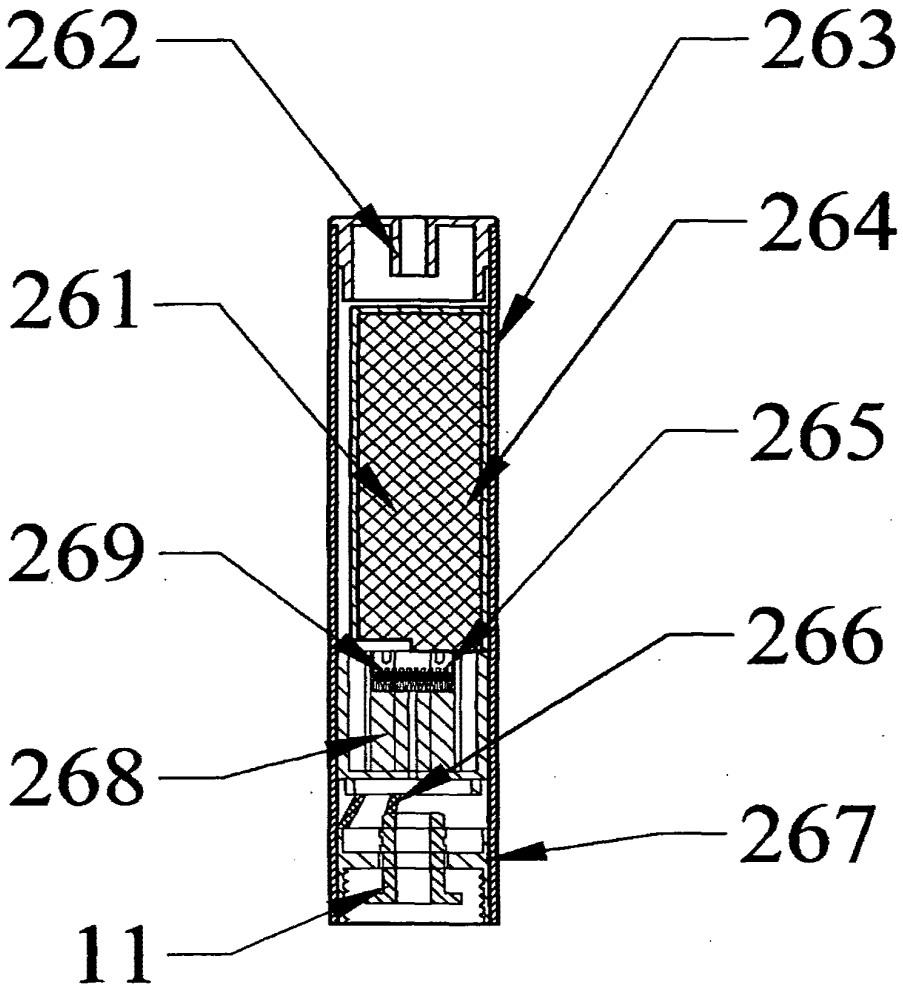

图 3

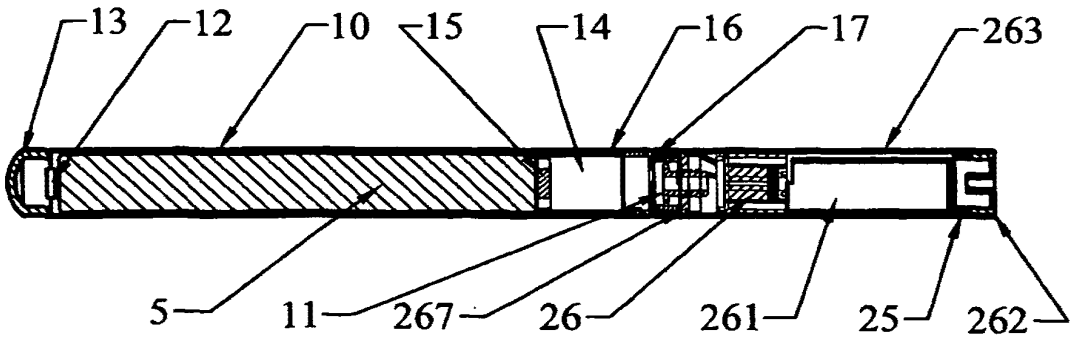

图 4

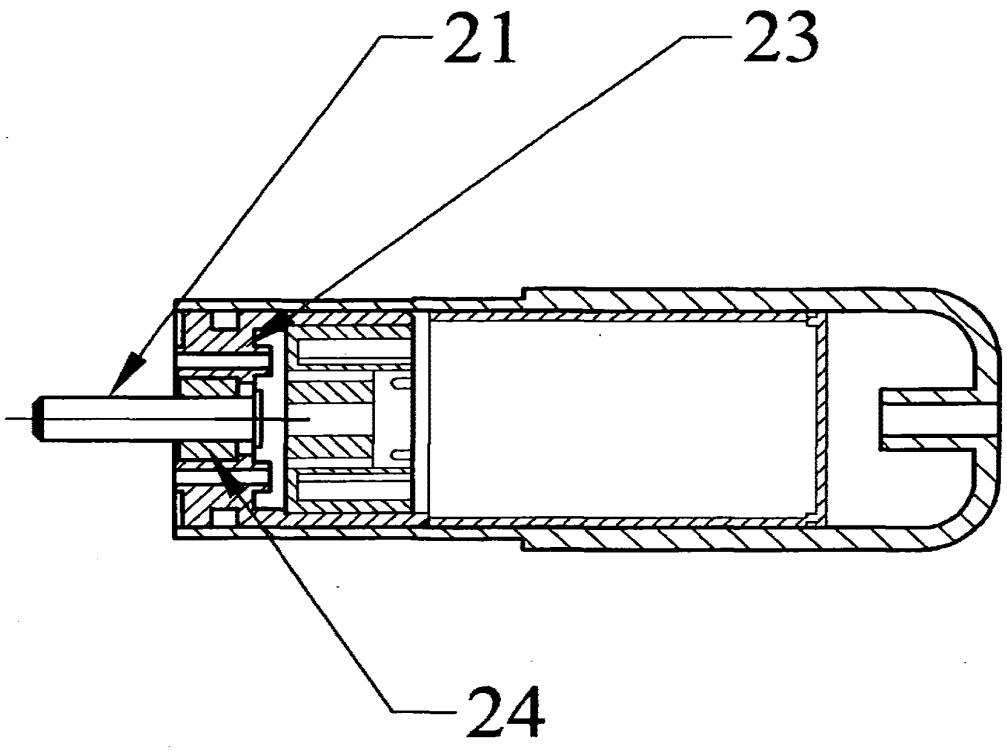

图 5

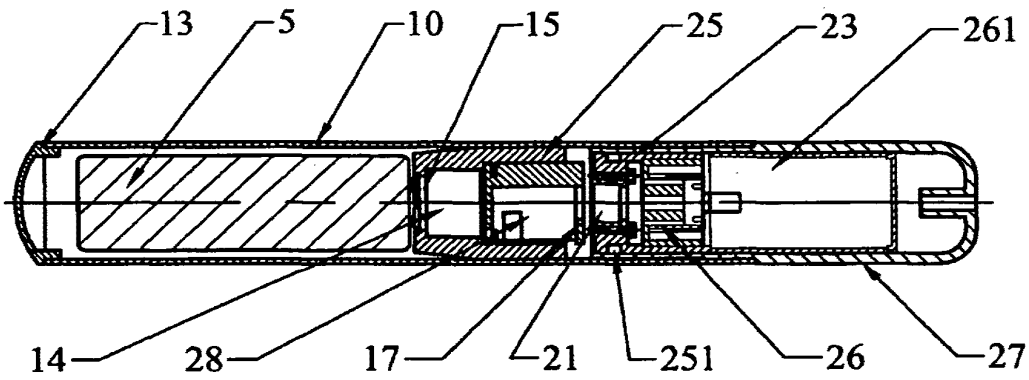

图 6

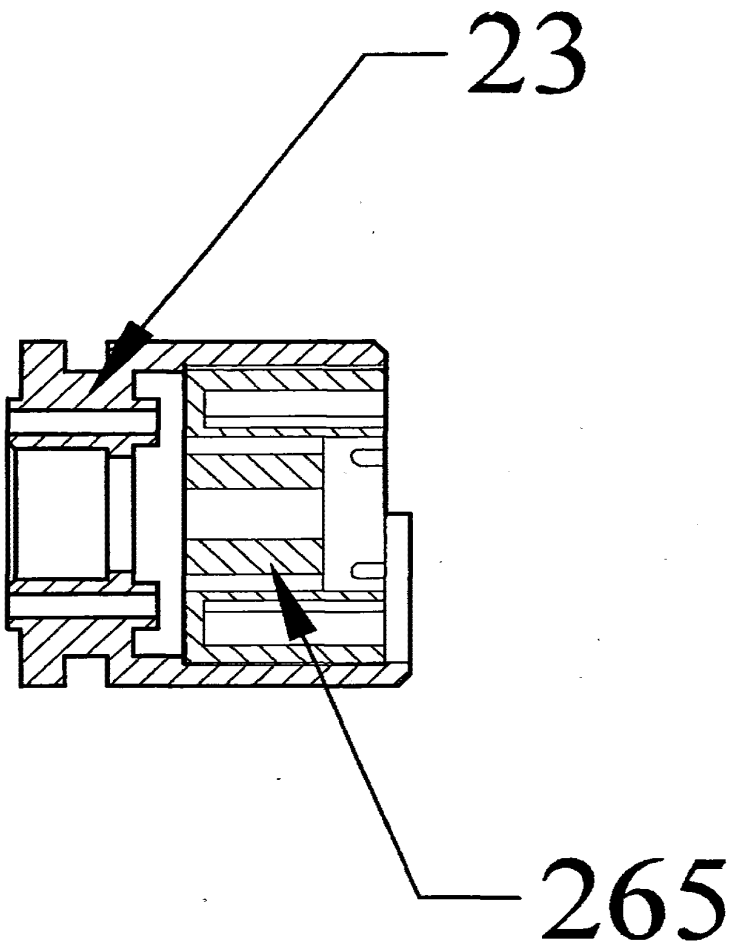

图 7

07-22-09

IFW

PATENT
Attorney Docket No. 104372.00002

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Examiner: Unassigned

Guocheng Pan

Application No.: 12/437,511 Art Unit: 1791

Filed: May 7, 2009

Title: Electronic Cigarette

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

CLAIM OF FOREIGN PRIORITY

Sir:

This application claims the priority of Chinese Patent Application No. 200910080147.5 filed March 24, 2009. Enclosed please find one certified copy of Chinese Patent Application No. 200910080147.5. If you have any questions or need any additional information, please contact the undersigned at the telephone number shown below.

Date: July 20, 2009

Respectfully submitted,

SQUIRE, SANDERS & DEMPSEY L.L.P.
One Maritime Plaza, Suite 300
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Telephone (415) 954-0241
Facsimile (415) 393-9887

Song Zhu
Attorney for Applicant
Registration No.: 44,420

CERTIFICATE OF EXPRESS MAILING (37 C.F.R. § 1.10)

I hereby certify that the following documents are being deposited with the United States Postal Service on the date shown below with sufficient postage as "Express Mail Post Office to Addressee" in an envelope addressed to Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Date: 7.20.2009

By: Danielle T. Peregory

PTO/SB/21 (09-04)
Approved for use through 07/31/2006. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission	3

Application Number	12/437,511
Filing Date	May 7, 2009
First Named Inventor	Guocheng Pan
Art Unit	1791
Examiner Name	Unassigned
Attorney Docket Number	104372.00002

ENCLOSURES *(check all that apply)*

- ☐ Fee Transmittal Form
  - ☐ Fee Attached
- ☐ Amendment / Reply
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☐ Information Disclosure Statement
- ☒ Certified Copy of Priority Document
  Chinese 200910080147.5
- ☐ Reply to Missing Parts/ Incomplete Application
  - ☐ Reply to Missing Parts under 37 CFR1.52 or 1.53
- ☐ Drawing(s)
- ☐ Licensing-related Papers
- ☐ Petition
- ☐ Petition to Convert to a Provisional Application
- ☐ Power of Attorney, Revocation Change of Correspondence Address
- ☐ Terminal Disclaimer
- ☐ Request for Refund
- ☐ CD, Number of CD(s) _____
  - ☐ Landscape Table on CD
- ☐ After Allowance Communication to TC
- ☐ Appeal Communication to Board of Appeals and Interferences
- ☐ Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- ☐ Proprietary Information
- ☐ Status Letter
- ☒ Other Enclosure(s) *(please identify below)*:
  Claim of Foreign Priority
  Postcard

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm	SQUIRE, SANDERS & DEMPSEY L.L.P. One Maritime Plaza, Suite 300 San Francisco, CA 94111-3492		
Signature			
Printed Name	Song Zhu		
Date	July 20, 2009	Reg. No.	44,420

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Signature			
Typed or printed name	Danielle T. Peregory	Date	7-20-2009

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/437,511	05/07/2009	Guocheng Pan	104372.00002

CONFIRMATION NO. 7646

44955
SQUIRE, SANDERS & DEMPSEY L.L.P.
275 BATTERY STREET, SUITE 2600
SAN FRANCISCO, CA 94111-3356

PUBLICATION NOTICE

Title: Electronic Cigarette

Publication No.US-2010-0242974-A1
Publication Date:09/30/2010

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently http://www.uspto.gov/patft/.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently http://pair.uspto.gov/. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Managment, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/437,511	05/07/2009	Guocheng Pan	104372.00002	7646

44955 7590 09/15/2011

SQUIRE, SANDERS & DEMPSEY (US) LLP
275 BATTERY STREET, SUITE 2600
SAN FRANCISCO, CA 94111-3356

EXAMINER	
SZEWCZYK, CYNTHIA	
ART UNIT	**PAPER NUMBER**
1741	
MAIL DATE	**DELIVERY MODE**
09/15/2011	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	12/437,511	PAN, GUOCHENG	
	Examiner	Art Unit	
	CYNTHIA SZEWCZYK	1741	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 May 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

5)☒ Claim(s) *1-14* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1,3-5 and 7-14* is/are rejected.

8)☒ Claim(s) *2,6 and 11* is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☒ The drawing(s) filed on *07 May 2009* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

12)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: “266” in figures 2 and 6, “26” in figure 7, “27” in figure 7. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character “11” has been used to designate both first electric connector and Rush Pith. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an

application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "11" and "17" have both been used to designate first electric connector. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

4. Claim 11 is objected to because of the following informalities: Line 2 reads “leaf-proof piece”. This should be “leak-proof piece”. Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 3-5, 8-10, 13 and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. Claim 3 recites the limitation "the Single Chip Micyoco" in line 3. There is insufficient antecedent basis for this limitation in the claim. Claims 4 and 5 are rejected by dependence.

8. Claim 8 recites “a medium being socked with a solution” in line 3 and claim 9 recites “the solution socked in the medium” in lines 2-3. It is not clear what is intended by the term “socked”. Claims 9, 10, 13, and 14 are rejected by dependence.

9. Claim 10 recites the limitation "the second electric connector" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 1, 7, 8, 11, and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by SUSA et al. (EP 0845220 A1).

SUSA teaches an electronic cigarette comprising a tubular electronic inhaler (12) and a tubular electronic atomizer (col. 2 lines 34-35), wherein the electronic inhaler includes an electric power source that provides an electric current to the electronic atomizer (col. 2 lines 38-39).

Regarding claim 7, SUSA teaches that the electronic inhaler and the atomizer are connected (abstract).

Regarding claim 8, SUSA teaches the electronic atomizer includes a liquid container (32) having a side-space for airflow (see figure 1), wherein the liquid container includes a medium being soaked with a solution to be atomized (col. 5 lines 51-58).

Regarding claim 11, SUSA teaches the electronic atomizer includes an electric connector (92 in figure 13), a ceramic heater (42) which would be considered a leak-proof piece, a supporting piece (44), a heat equalizer (46) coupled with an electric heating wire (94), a fluid container (32) filled with a medium (36), and an atomizer cap with an air-puffing hole (38).

Regarding claim 12, SUSA teaches that the electric power source is inside the electronic inhaler (abstract).

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

14. Claims 9, 10, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over SUSA et al. (EP 0845220 A1).

SUSA teaches an electronic cigarette comprising a tubular electronic inhaler (12) and a tubular electronic atomizer (col. 2 lines 34-35), wherein the electronic inhaler includes an electric power source that provides an electric current to the electronic atomizer (col. 2 lines 38-39).

Regarding claim 9, SUSA teaches that the electronic atomizer includes an electric heating wire (94 in figure 13), a heat equalizer (46) onto which the electric heating wire is wired and is made of inorganic fibers (col. 7 line 56-col. 8 line 9), and a supporting piece (44) that is disposed next to the heat equalizer. It would have been obvious to one of ordinary skill in the art that the supporting piece could have been made of ceramic material because SUSA teaches that the supporting piece helps support the ceramic heater (col. 7 lines 29-32) wherein

one of ordinary skill in the art would recognize that since SUSA suggests ceramic for the heater, it would also be available to be used for the supporting piece.

Regarding claim 10, SUSA teaches that the electronic atomizer includes a ceramic heater (42) which would be considered a leak-proof member.

Regarding claim 13, SUSA teaches that power supply is a DC power supply (col. 8 lines 40-44). It would have been obvious to one of ordinary skill in the art that if the power supply is a DC power supply then the electronic cigarette would include a DC plug and DC socket.

Regarding claim 14, SUSA teaches that casings are cylindrical (col. 5 lines 15-16) and that they are connected via a screw-type structure (col. 5 lines 26-28).

Allowable Subject Matter

15. Claims 2 and 6 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

16. Claims 3-5 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

17. Claims 2-6 teach that the electronic cigarette includes a Single Chip Micyoco to control the atomization. Although SUSA teaches using a circuit board to control the operation, SUSA does not teach or suggest specifically using a Single Chip Micyoco to control the atomization in the electronic cigarette. “Single

Chip Micyoco" has been interpreted to be a type of chip, and not a trademark. If the term "Single Chip Micyoco" is actually a trademark, then it must be replaced with generic terminology for the chip having that trademark to avoid a rejection under 35 USC 112, second paragraph.

Conclusion

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

19. ROBINSON et al. (US 2008/0092912).

20. NIELSON et al. (US 2009/0283103).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CYNTHIA SZEWCZYK whose telephone number is (571)270-5130. The examiner can normally be reached on Monday through Friday 9 am to 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Daniels can be reached on (571) 272-2450. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CS

/Matthew J. Daniels/

Supervisory Patent Examiner, Art Unit 1741

Notice of References Cited	Application/Control No. 12/437,511	Applicant(s)/Patent Under Reexamination PAN, GUOCHENG	
	Examiner CYNTHIA SZEWCZYK	Art Unit 1741	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2008/0092912	04-2008	Robinson et al.	131/200
*	B	US-2009/0283103	11-2009	Nielsen et al.	131/273
	C	US-			
	D	US-			
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FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N	EP 845220 A1	06-1998	European Patent	SUSA et al.	
	O					
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NON-PATENT DOCUMENTS

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Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12437511	PAN, GUOCHENG
	Examiner	**Art Unit**
	CYNTHIA SZEWCZYK	1741

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

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(54) FLAVOR PRODUCING ARTICLE

(57) A flavor generation article (10) has a casing (12) constituted by first and second portions (12a, 12b) that are detachably connected to each other. A gas flow path (26) is formed in the casing first portion (12a) to extend from an air intake port (24) to reach a suction port (22). The first portion (12a) incorporates a material container (32) of a liquid material (36) containing a flavor substance. A discharge port (35) of the material container (32) is arranged in the gas flow path (26), and a ceramic heater (42) is disposed to oppose it. The liquid material (36) is supplied from the discharge port (35) onto the ceramic heater (42) and is heated, so that it is gasified in the gas flow path (26). The casing second portion (12b) incorporates a control circuit (72) and a power supply (62).

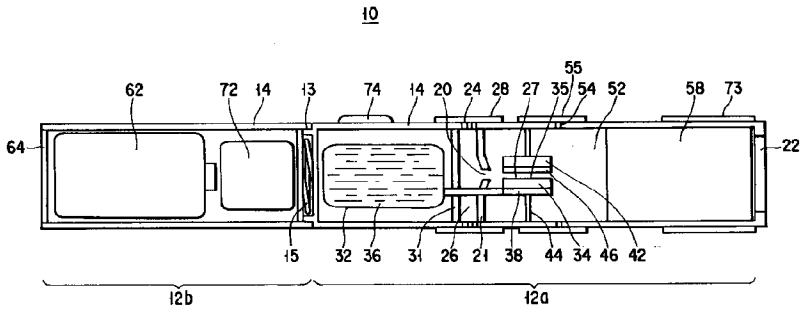

FIG. 1

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Description

Technical Field

The present invention relates to a flavor generation article employed for enjoying inhalation of a flavor and simulated smoking and, more particularly, to a flavor generation article used for generating the flavor as an inhalation target by heating a liquid material with an electric heater.

Background Art

A simulated smoking article employed for enjoying the flavor and smoke of tobacco without burning tobacco is already known, and various types of simulated smoking articles have been proposed.

Jpn. Pat. Appln. KOKAI Publication No. 3-232481 discloses a typical concept of a conventional simulated smoking article. The article of this reference uses, e.g., a rod-like solid material. When the solid material is heated by a heating element, an inhalation target, e.g., a flavor, is generated. The drawbacks of the article of this type are as follows. When the solid material is continuously heated, the material is largely wasted. Inversely, when the solid material is heated in accordance with inhalation of the user, a large time lag occurs between the start of inhalation (one puffing operation) of the user and generation of the flavor.

As an example of an article that copes with the above drawbacks, Jpn. Pat. Appln. KOKAI Publication No. 3-277265 discloses a flavor emitting article having a solid material divided into a large number of portions. In the article of this reference, the respective portions of the solid material are sequentially heated in units of puffing operations of the user to generate an inhalation target, e.g., a flavor or the like. The drawback of this article is that the solid material and a heating element constitute an integral flavor generation medium. Therefore, when the material is consumed, the heating element must be exchanged or disposed of together with the material, which is not preferable both in terms of economy and environment.

Jpn. Pat. Appln. KOKAI Publication No. 5-212100 discloses an example of a mechanism that detects one puffing operation of the user. In the article of this reference, the driving operation of a heating element for heating the flavor material is controlled by a signal obtained from the motion of the lips of the user.

U.S.P. No. 4,945,931 discloses a simulated smoking article using a pressurized aerosol container. In the article of this reference, the puffing operation of the user swings the vanes to mechanically open the outlet port of the container, and the aerosol is emitted. As a modification, this reference also discloses an article in which a heating element for heating aerosol cooled by the heat of evaporation is disposed in the outlet port of the container. The drawback of this reference is as follows. Since the pressurized aerosol is closed in the container with a valve which is opened/closed merely by the puffing operation of the user, once the valve is opened, a large amount of aerosol leaks undesirably. More specifically, in the article of this reference, a predetermined amount of aerosol appropriate for one puffing operation cannot be continuously emitted, and rather all of the pressurized flavor gas may undesirably be emitted until a puffing operation is complete twice or three times.

Disclosure of Invention

The present invention has been made in view of the above problems, and has as its object to provide a flavor generation article in which waste of a flavor material does not occur easily and the timing of one puffing operation of the user and that of generation of a flavor can be matched easily.

According to the first aspect of the present invention, there is provided a flavor generation article characterized by comprising:

a casing having an air intake port for taking in air therein and a suction port through which a user inhales a flavor, and forming a gas flow path between the intake port and the suction port;
a material container for storing a liquid material which contains at least a flavor substance and having a discharge port for the material, the material container being mounted on the casing;
discharge driving means for discharging the material from the container through the discharge port in the form of a liquid drop;
gasifying means disposed in the gas flow path to receive the liquid drop of the material discharged from the container and gasify the material by electrically heating the liquid drop; and
a power supply for supplying electric energy to the gasifying means.

According to the second aspect of the present invention, there is provided a flavor generation article in the first aspect, characterized by further comprising a sensor for detecting an inhaling operation of the user and control means for controlling, based on a signal from the sensor, the discharge driving means so as to discharge the material from the container.

According to the third aspect of the present invention, there is provided a flavor generation article in the second aspect, characterized in that the sensor comprises a pressure-sensitive sensor mounted on the casing around the suction port.

According to the fourth aspect of the present invention, there is provided a flavor generation article in the second or third aspect, characterized in that the control means controls the gasifying means based on the signal from the sensor so that the gasifying means generates heat.

According to the fifth aspect of the present invention, there is provided a flavor generation article in the fourth aspect, characterized in that the control means controls the gasifying means and the discharge driving means so as to preheat the gasifying means prior to discharge of the material.

According to the sixth aspect of the present invention, there is provided a flavor generation article in the first aspect, characterized in that the power supply is disposed in the casing.

According to the seventh aspect of the present invention, there is provided a flavor generation article in the sixth aspect, characterized in that the casing is constituted by first and second portions that are electrically connected to each other through a cable, the gas flow path, the container, the discharge driving means, and the gasifying means being disposed in the first portion, and the power supply being disposed in the second portion.

According to the eighth aspect of the present invention, there is provided a flavor generation article in the seventh aspect, characterized in that the first and second portions of the casing are detachably connected to each other through a connecting portion.

According to the ninth aspect of the present invention, there is provided a flavor generation article in the first aspect, characterized by further comprising an operation lever for manually operating the discharge driving means.

According to the 10th aspect of the present invention, there is provided a flavor generation article in any one of first to ninth aspects, characterized in that the gasifying means comprises a porous layer, and the liquid drop of the material is supplied onto the porous layer.

According to the 11th aspect of the present invention, there is provided a flavor generation article in any one of the first to 10th aspects, characterized in that the gasifying means is arranged to oppose the discharge port, and a throttle hole for directing air flowing from the air intake port toward a gap between the discharge port and the gasifying means is disposed in the gas flow path.

According to the 12th aspect of the present invention, there is provided a flavor generation article in any one of first to 11th aspects, characterized in that the casing is formed with an outer air inlet hole to supply an outer air into the gas flow path between the gasifying means and the suction port.

According to the 13th aspect of the present invention, there is provided a flavor generation article in any one of first to 12th aspects, characterized by further comprising a formed body of a solid material containing at least a flavor substance and disposed in the gas flow path so as to be located between the gasifying means and the suction port.

According to the 14th aspect of the present invention, there is provided a flavor generation article in the 13th aspect, characterized by further comprising heating means for heating the formed body.

According to the present invention, a flavor generation article can be provided in which waste of a flavor material does not occur easily and the timing of one puffing operation of the user and that of generation of a flavor can be matched easily. In particular, when the discharge driving means is controlled based on a signal from a sensor that detects the inhaling operation of the user, not only waste of the material is eliminated, but also a stable flavor can constantly be provided. When the casing is divided into a portion incorporating a power supply and a portion to be held by the mouth such that the two portions are detachable from each other, the flavor generation article can be used more conveniently.

Brief Description of Drawings

FIG. 1 is a schematic view showing a flavor generation article according to an embodiment of the present invention;

FIG. 2 is a plan view showing the discharge head of the flavor generation article shown in FIG. 1;

FIG. 3 is an enlarged schematic view showing the discharge head and discharge drive portion taken along the line III - III of FIG. 2;

FIG. 4 is a diagram showing the control system of the flavor generation article shown in FIG. 1;

FIG. 5 is a view showing the state of use of the flavor generation article shown in FIG. 1;

FIG. 6 is a graph showing an example of operation timing of energization of the ceramic heater and that of actuation of the discharge drive portion, of the flavor generation article shown in FIG. 1;

FIG. 7 is a graph showing another example of operation timing of energization of the ceramic heater and that of actuation of the discharge drive portion, of the flavor generation article shown in FIG. 1;

FIG. 8 is a schematic view showing a flavor generation article according to another embodiment of the present invention;

FIG. 9 is a schematic view showing a flavor generation article according to still another embodiment of the present invention,.

FIG. 10 is a schematic view showing a flavor generation article according to still another embodiment of the present invention;

FIG. 11 is a schematic view showing a flavor generation article according to still another embodiment of the present invention;

FIG. 12 is a schematic view showing a flavor generation article according to still another embodiment of the present invention;

FIG. 13 is a schematic view showing a flavor generation article according to still another embodiment of the present invention;

FIG. 14 is a schematic view showing a flavor gener-

ation article according to still another embodiment of the present invention;

FIG. 15 is a schematic view showing a flavor generation article according to still another embodiment of the present invention; and

FIG. 16 is a schematic view showing a flavor generation article according to still another embodiment of the present invention.

Best Mode of Carrying Out the Invention

FIG. 1 is a schematic view showing a flavor generation article according to an embodiment of the present invention.

A flavor generation article 10 has a cylindrical casing 12 having such an outer diameter that the user can hold the casing 12 in his mouth. The casing 12 comprises a first portion 12a to be held by the user's mouth, and a second portion 12b for incorporating a power supply and the like. The two portions 12a and 12b are detachably connected to each other through a connecting portion 13 formed on a casing main body 14. The two portions 12a and 12b are electrically connected to each other through a cable 15 stored in a space formed in the casing main body 14 to correspond to the connecting portion 13. As the connecting portion 13, a known structure, e.g., a screw or a fitting pair, can be employed. The main body 14 of the casing 12 is made of a material, e.g., a plastic, metallic, ceramic, or wooden material.

A suction port 22 through which the user inhales the flavor is formed in the end portion of the first portion 12a of the casing 12. In contrast to this, a plurality of air intake ports 24 for taking in air into the casing 12 are formed in the intermediate portion of the first portion 12a. A gas flow path 26 is defined in the casing 12 between the air intake ports 24 and the suction port 22. The air intake ports 24 can be formed to have an open area corresponding to a predetermined air intake amount. As shown in FIG. 1, an adjusting ring 28 having a plurality of openings can be disposed on the casing 12 around the air intake ports 24. In this case, the amount of air flowing into the casing 12 can be adjusted by adjusting the position of the adjusting ring 28 with respect to the air intake ports 24.

A throttle plate 21 having a throttle hole 20 at its center is disposed in the casing 12 to be located in the gas flow path 26. The throttle hole 20 serves to regulate air from the air intake ports 24 to flow along the surface of a ceramic heater 42 (to be described later).

A material container 32 for storing a liquid material 36 for generating a flavor or the like to be inhaled by the user is detachably fixed in a space which is deep in the first portion 12a of the case and partitioned from the gas flow path 26 by a wall 31. The material container 32 stores the liquid material 36 in an amount corresponding to the discharge amount of a plurality of puffing operations of the user.

The material container 32 can be mounted on the outer side of the casing main body 14. In this case, the head portion of the material container 32 may be inserted in the casing main body 14, or only discharge ports 35 (to be described later) may be inserted in the casing main body 14.

The liquid material 36 contains at least a flavor substance. For example, if the liquid material 36 is an article used for enjoying only the flavor, e.g., menthol or caffeine, it can be a material that generates only the flavor. Also, in order to add smoke to the flavor, the liquid material 36 can contain a material which generates aerosol when heated. As the material that generates aerosol, alcohols, saccharide, or water, or a mixture of at least two of these components can be used. The alcohols used in this case are, e.g., glycerin or propylene glycol, or their mixture.

More specifically, the liquid material 36 can contain an extracted material and/or the constituent components of various types of natural materials in accordance with the application purpose. For example, if this article is used as a simulated smoking article, a tobacco component, e.g., a tobacco extracted component or a tobacco smoke condensate component, may be contained in the liquid material 36.

The material container 32 is formed with a discharge head 34 having the plurality of discharge ports 35 for discharging the liquid material 36 in a transverse direction of the casing 12. The discharge head 34 is arranged to be located closer to the suction port 22 than the throttle hole 20. A discharge drive portion 38 is disposed adjacent to the discharge ports 35 to discharge the liquid material 36 from the material container 32 through the discharge ports 35. The discharge head 34 and the discharge drive portion 38 comprise a liquid discharge mechanism (having the same principle as that of the method shown in Jpn. Pat. Appln. KOKOKU Publication No. 53-45698 and U.S.P. No. 3,596,275) utilizing a piezoelectric element.

For example, as shown in FIG. 2, 10 discharge ports 35 are arranged for two rows, leading to a total of 20 discharge ports 35 in a region with a width W of about 2 mm and a length L of about 5 mm of the upper surface of the discharge head 34. The center of arrangement of the discharge ports 35 almost coincides with the center of the ceramic heater 42 (to be described later).

FIG. 3 is an enlarged schematic view showing the discharge head 34 and discharge drive portion 38 taken along the line III - III of FIG. 2. More specifically, FIG. 3 shows a section corresponding to one row of the discharge ports 35. A section corresponding to the other row of the discharge ports 35 and the section shown in FIG. 3 are horizontally symmetrical.

As shown in FIG. 3, a frame 134 constituted by a plurality of components is stacked on a wiring board 132 to form recessed portions and holes to be filled with the liquid material 36. The recessed portions formed by the

frame 134, excluding the plurality of discharge ports 35, are covered with a film 136. A liquid reservoir 146 is formed under the discharge ports 35 to temporarily store the liquid material 36. The bottom plate of the liquid reservoir 146 is constituted by an electrode 138 that serves as a vibration plate.

The liquid material 36 from the material container 32 is supplied first through a narrow flow path 142, and flows from a plurality of suction holes 144, having a smaller diameter than that of the discharge ports 35, to reach the liquid reservoir 146. Under the control of a control circuit 72, when the electrode 138 is operated to vibrate, the liquid material 36 is selectively discharged through the discharge ports 35 having a low resistance against the flow. The discharged liquid material 36 is supplied onto the ceramic heater 42 as a liquid drop LD.

Other than this, as the discharge mechanism of the liquid material 36, a known printer ink discharge mechanism can be modified and employed, e.g., a method disclosed in Jpn. Pat. Appln. KOKOKU Publication No. 61-59911 and the like wherein the process liquid is injected by bubbles generated by heating it, or a method disclosed in U.S.P. No. 3,060,429 and the like wherein the particles of the process liquid are electrified to perform electric field control. Alternatively, a discharge mechanism in which a liquid material 36 is a pressurized liquid and is controlled by opening/closing a valve disposed in a discharge ports 35 may be employed.

The ceramic heater 42 is disposed in the gas flow path 26 to oppose the discharge ports 35. The ceramic heater 42 is fixed on the inner surface of the casing main body 14 through a support member 44. A gap 27 between the discharge ports 35 of the discharge head 34 and the ceramic heater 42 is set such that air from the throttle hole 20 can flow through it. Accordingly, air from the air intake ports 24 is directed by the throttle hole 20 to the gap 27 between the discharge ports 35 and ceramic heater 42.

A material corresponding to one puffing operation, which is driven by the discharge drive portion 38 and emitted from the discharge ports 35 is supplied onto the ceramic heater 42 in the form of a liquid splash or liquid drop. The ceramic heater 42 is constituted by a ceramic plate and a coated resistance heater on the ceramic plate, and is accordingly an integral member of a catch pan for receiving the splash of the material and a heating means for heating the catch pan. However, the catch pan and the heating means can be disposed as separate components.

A liquid-absorbing porous layer 46 having a thickness of 0.01 mm to 2.0 mm, e.g., an activated carbon layer having a thickness of about 0.5 mm, is formed on a surface of the ceramic heater 42 that receives the liquid splash of the material, i.e., a surface of the ceramic heater 42 that serves as the catch pan. The porous layer 46 not only protects the surface of the ceramic heater 42 but also relaxes heat conduction from the ceramic heater 42, thereby stabilizing gasification of the splash of the material. The porous layer 46 can be formed of an organic compound, e.g., natural cellulose, a cellulose derivative, or an aramid resin, or an inorganic compound, e.g., carbon (including activated carbon), alumina, or silicon carbide. The porous layer 46 can have an arbitrary shape. For example, the compound mentioned above may be formed as a formed body in advance, e.g., a film, a sheet, a plate, fabric, or unwoven fabric, and be used as the porous layer 46. Alternatively, the porous layer 46 may be formed by directly applying the powder of the component mentioned above on the ceramic heater 42.

A cooling chamber 52 is formed between the ceramic heater 42 and the suction port 22 to constitute part of the gas flow path 26. Outer air inlet holes 54 are formed in the side wall of the casing main body 14 defining the cooling chamber. The gas heated by the ceramic heater 42 and containing a flavor is mixed with the outer air and cooled in the cooling chamber 52, and reaches the suction port 22. The outer air inlet holes 54 can be formed to have an open area corresponding to a predetermined air inlet amount. As shown in FIG. 1, an adjusting ring 55 having a plurality of openings can be disposed on the casing 12 around the outer air inlet holes 54. In this case, the amount of outer air flowing into the cooling chamber 52 can be adjusted by adjusting the position of the adjusting ring 55 with respect to the outer air inlet holes 54.

A filter 58 is disposed in the gas flow path 26 between the cooling chamber 52 and suction port 22 to cover the suction port 22. When the filter 58 is disposed, the pressure loss can be adjusted so that the flavor component can be inhaled with an appropriate pressure. The filter 58 can be made of a normal tobacco filter material made of cellulose acetate, pulp, or the like.

A power supply 62 is detachably fixed in the second portion 12b of the casing 12. The power supply 62 is used to supply electric energy to the discharge drive portion 38, the ceramic heater 42, and the control circuit 72 (to be described later). The power supply 62 can be mounted in and removed from the casing main body 14 by opening/closing a cap 64 that closes the rear opening of the casing main body 14. The power supply 62 is preferably a DC power supply, e.g., a commercially available dry cell or rechargeable cell. However, the power supply 62 can be an AC power supply. The power supply 62 can be mounted on the outer side of the casing main body 14, or can be provided separately and connected to the casing main body 14 with a wire.

The control circuit 72 for controlling the driving operation of the discharge drive portion 38 and the ceramic heater 42 is arranged between the power supply 62 and material container 32. As shown in FIG. 4, the control circuit 72 has a signal processing circuit 72a, a drive circuit 72b, and a power circuit 72c. The signal processing circuit 72a is connected to a sensor 73 for detecting the inhaling operation of the user and a manual ON/OFF switch 74. The drive circuit 72b is con-

nected to the discharge drive portion 38 and the ceramic heater 42. The power circuit 72c is connected to the power supply 62.

The sensor 73 for detecting the inhaling operation of the user is disposed around the casing main body 14 to be adjacent to the suction port 22. The sensor 73 has the same principle as that of a general strain type pressure-sensitive sensor for detecting a change in resistance or capacitance, a piezoelectric electromotive force, or the like, and generates an electrical signal upon detection of a pressure with which the user holds the casing 12 in his mouth. Alternatively, as the sensor 73, a swing vane type sensor (to be described later), a contact type sensor, a lip sensor disclosed in Jpn. Pat. Appln. KOKAI Publication No. 5-212100, or the like can be used.

Upon reception of a signal from the manual ON/OFF switch 74, or based on a signal from the sensor 73, the control circuit 72 starts the discharge drive portion 38 and the ceramic heater 42 at a timing to match the inhaling operation of the user, so that the liquid material is discharged and gasified. For example, signal processing of the control circuit 72 and the way of control of the control circuit 72 can be known as analog control or two-position control, or their combination.

The manual ON/OFF switch 74 is disposed on the side surface of the first portion 12a of the casing 12. When this article is not in use, the switch 74 may be manually switched to the OFF state, thereby forcibly stopping the discharge drive portion 38 and the heater 42. The manual switch 74 has the same mechanism as that of a general compact push switch, e.g., a micro limit switch having an electric contact.

When this article is in use, i.e., while the switch 74 is set in the ON state, the heater 42 may be kept heated. In this case, the control circuit 72 need only control the operation of the discharge drive portion 38 that controls discharge of the liquid material.

How the flavor generation article 10 shown in FIG. 1 is operated will be described.

When the user performs simulated smoking or inhales the flavor by using the flavor generation article 10 shown in FIG. 1, first, the user turns on the manual switch 74, holds the first portion 12a of the casing 12 with his mouth, and performs an inhaling operation through the suction port 22. By this operation, the sensor 73 outputs an inhaling operation signal to the control circuit 72. Accordingly energization of the ceramic heater 42 is started under the control of the control circuit 72. Simultaneously, or with a lapse of a predetermined period after the start of energization, the discharge drive portion 38 is actuated.

The liquid material 36 is then discharged from the discharge ports 35 and gasified as it is heated by the ceramic heater 42. As the user performs an inhaling operation, the gasified material is mixed with main suction air which has been taken in from the air intake ports 24, passed through the throttle hole 20, and guided to a portion between the discharge ports 35 and ceramic heater 42, and is guided to the suction port 22.

Energization of the ceramic heater 42 and actuation of the discharge drive portion 38 are performed, e.g., at the operation timings shown in FIG. 6 or 7. FIG. 6 shows a case wherein, in response to a signal from the sensor 73, the ceramic heater 42 is energized and heated and the liquid material 36 is discharged simultaneously. FIG. 7 shows a case wherein, in response to a signal from the sensor 73, the ceramic heater 42 is energized and preheated in advance, and with a lapse of a predetermined period of time, i.e., when the heater temperature has increased to a certain degree, the liquid material 36 is discharged.

If necessary, the amount of main suction air taken in from the air intake ports 24 and the amount of inlet air supplied from the outer air inlet holes 54 can be changed by adjusting the adjusting rings 28 and 60 during inhalation. Then, the taste of air containing the flavor and reaching the suction port 22 can be changed, so that the user can perform simulated smoking or inhalation of the flavor in accordance with the taste of his inhalation feeling.

As described above, the casing 12 has a structure in which the first portion 12a storing the liquid material 36, the discharge head 34, the ceramic heater 42, and the like, and the second portion 12b storing the control circuit 72, the power supply 62, and the like are detachably connected to each other through the connecting portion 13. The first and second portions 12a and 12b are electrically connected to each other through the cable 15. Therefore, this flavor generation article 10 may be used with its first and second portions 12a and 12b being integrally connected to each other through the connecting portion 13, or may be used with its first and second portions 12a and 12b being separated from each other, as shown in FIG. 5. In the state shown in FIG. 5, since the first and second portions 12a and 12b can be separated within a range allowed by the cable 15, for example, the user can place the second portion 12b in his pocket and hold only the first portion 12a in his mouth. Alternatively, the second portion 12b separated from the first portion 12a may be connected to an existing power supply, i.e., may be installed.

Several experiments using the flavor generation article 10 shown in FIG. 1 will be described.

First, as the flavor substance, some natural peppermint oil was used, and as the aerosol generation material to add smoke to the flavor, glycerin was used. Water was added to the natural peppermint oil and glycerin, thereby preparing a plurality of liquid materials 36 in which the water to glycerin concentration ratio changed in a range of about 2 : 98 to about 90 : 10. Aerosol containing a flavor substance obtained by heating each liquid material 36 was inhaled, by using the flavor generation article shown in FIG. 1, with a standard smoking condition of one cycle for about one minute in which 35 cc to 50 cc of aerosol were inhaled in one

inhaling operation for about 2 seconds with an interval of about 58 seconds.

As a result, when a liquid material having a water to glycerin concentration ratio of 50 : 50 and prepared by adding some natural peppermint oil was employed as the liquid material 36, sufficiently high discharge stability was ensured, and physical satisfaction and requirement for a visually observed smoke amount upon inhalation were achieved to a certain degree. Therefore, in the following experiments, this liquid material was used as the liquid material 36. In the following experiments as well, inhalation was performed with the standard smoking condition of one cycle for about one minute in which 35 cc to 50 cc of aerosol were inhaled in one inhaling operation for about 2 seconds with an interval of about 58 seconds, and a discharge speed of about 2.5 mg/second was employed.

With this condition, the operation timings shown in FIGS. 6 and 7 were compared. First, at the timing shown in FIG. 6, the heater was heated from room temperature to about 400°C within 2 seconds. In this case, the liquid material 36 accumulated on the heater surface while the heater increased to the temperature that enabled gasification was gasified at once, and was condensed near the discharge ports 35 because of rapid expansion or flied in the form of a liquid drop because of bumping, thus decreasing the yield. Subsequently, the heater was preheated to about 140°C to 220°C during the preheat time at the timing shown in FIG. 7, and was thereafter heated to 420°C to 440°C within 2 seconds. In this case, the liquid material 36 was effectively gasified in an interlocked manner with discharge.

The inhalation time of the user should correspond to a time period between the start and end of energization of the heater and discharge in FIG. 6, and should correspond to a time period between the start and end of energization of the heater, including the preheat time, in FIG. 7. Accordingly, the preheat time is preferably set within a range of about 0.1 second to 1 second in the standard smoking time, so that the user will not feel discomfort during inhalation, and it is required that the preheat time is not so high.

For example, when the heater was preheated to about 400°C with a preheat time of 2 seconds, the material discharged after that was rapidly gasified and expanded. Then, the proportion of the material that was condensed near the discharge ports 35 increased, inversely decreasing the yield. Also, since the inhalation operation was allowed with the lapse of 2 seconds after the user held the sensor 73 of the suction port 22 in his mouth, a time lag occurred to make the user feel discomfort. In this experiment, with the operation timings shown in FIG. 7, preheat from room temperature to 140°C spent a preheat time of about 0.5 second, and preheat to 220°C spent a preheat time of about 1 second.

When the surface of the ceramic heater 42 had no porous layer 46 but was flat, a phenomenon in which the liquid material 36 was not easily caught by the heater surface but was bounded was observed. In this case, at either timings shown in FIG. 6 or 7, the yield tended to decrease.

Regarding the main inhalation air which flowed through the throttle hole 20 and passed through the gap 27, the higher the flow velocity to a certain degree, the better the gasification efficiency of the liquid material. Concerning this, under the standard smoking condition of 35 cc to 50 cc per inhalation for 2 seconds, a desired result was obtained when the position of the throttle hole 20 was within about 30 mm from the center of the gap 27 and the velocity of air passing through the throttle hole 20 was equal to or higher than about 6 m/second. This corresponds to the sectional area of the opening of the throttle hole 20 of about 3 mm^2 or less. However, it is nonsense to decrease the sectional area of the opening (to increase the flow velocity) to such a degree that it becomes impossible for the user to perform inhalation with his mouth. Considering the above respects, the lower limit of the sectional area of the opening of the throttle hole 20 is supposed to be preferably about 0.6 mm^2.

The size of the gap 27, i.e., the vertical distance between the discharge ports 35 and ceramic heater 42 also influenced the gasification efficiency of the liquid material 36. In order to suppress a decrease in yield caused by condensation of the gas near the discharge ports 35, the ceramic heater 42 and discharge ports 35 must oppose each other through a distance equal to or larger than about 2 mm.

Several flavor generation articles according to other embodiments of the present invention will be described. In the drawings indicating these embodiments, portions that are common to the preceding drawings are denoted by the same reference numerals, and a detailed description thereof will be omitted.

FIG. 8 is a schematic view showing a flavor generation article according to another embodiment of the present invention.

The flavor generation article of this embodiment is similar to the flavor generation article shown in FIG. 1, but the orientation of discharge ports 35 of a discharge head 34 is different from that of the structure shown in FIG. 1 by 90° , so that the discharge ports 35 may be directed to a suction port 22. Accordingly, a ceramic heater 42 opposing the discharge ports 35 is set such that its direction is different from that of the structure shown in FIG. 1 by 90° . Since the discharge head 34 is arranged in a throttle hole 20, the substantial opening of the throttle hole 20 that serves as a gas flow path 26 is regulated by the size of both the throttle hole 20 and discharge head 34.

FIG. 9 is a schematic view showing a flavor generation article according to still another embodiment of the present invention.

The characteristic feature of the flavor generation article of this embodiment resides in that, first, a casing

12 cannot be separated into first and second portions 12a and 12b (see FIG. 1), and a liquid material 36, a discharge head 34, a ceramic heater 42, a power supply 62, a control unit 72, and the like are incorporated in one casing main body 14. However, a mouthpiece 16 is detachably mounted on the casing main body 14 through a connecting portion 18, and a suction port 22 is formed in the mouthpiece 16. The mouthpiece 16 is made of a material, e.g., a plastic or wood. As the connecting portion 18, a known structure, e.g., a screw or a fitting pair can be employed. In place of the mouthpiece 16, a filter may be inserted in the casing main body 14 and served for use.

The discharge head 34 provided to a material container 32 has one discharge port 35 which is oriented to discharge the liquid material 36 toward the suction port 22. Accordingly, the ceramic heater 42 opposing the discharge port 35 is oriented in the same direction as that of the structure shown in FIG. 8. No throttle plate 21 (see FIG. 1) is disposed in a gas flow path 26. Air that has flowed into the article flows on the ceramic heater 42 because it is regulated by a support member 44 supporting the ceramic heater 42.

FIG. 10 is a schematic view showing a flavor generation article according to still another embodiment of the present invention.

The flavor generation article of this embodiment is similar to the flavor generation article shown in FIG. 9 but is largely different from it in that its material container 32 is manually operated to discharge. For this reason, the material container 32 is connected to an operation lever 76 projecting outside a casing main body 14. When the lever 76 is depressed, a material corresponding to one puffing operation is emitted from a discharge port 35, and is supplied onto a ceramic heater 42 in the form of a liquid splash or liquid drop. A control circuit 72 receives a signal indicating a depressing operation of the lever 76, and supplies power to the ceramic heater 42 based on this signal to heat it, thereby gasifying the material splash. In fine, the lever 76 serves as both the discharge drive portion 38 for the flavor generation article and the sensor 73 for detecting the inhaling operation of the user that are shown in FIG. 1.

In the flavor generation article shown in FIG. 10, the material container 32 is also connected to an injection port 82 for replenishing the material container 32 with a liquid material 36. The end portion of the injection port 82 is exposed outside the casing main body 14, and the liquid material can be injected and replenished to the material container 32 through this end portion. As described above, the material container 32 has a capacity sufficient for storing the liquid material 36 in an amount corresponding to the total discharge amount of a plurality of puffing operations of the user. However, if the material can be replenished, the material container 32 need not be exchanged, but this flavor generation article can be used further continuously.

In order to observe the remaining amount in the material container 32, a transparent inspection window 84 is formed in the side wall of the casing main body 14 to correspond to the material container 32. Accordingly, in this case, the material container 32 itself is also a transparent or translucent container. When the remaining amount of the liquid material 36 in the material container 32 is monitored through the inspection window 84, the user can know the timing at which the container should be replenished with the material.

In place of the arrangement shown in FIG. 10, a combination of an electric remaining amount detection means and an electric display means can be used to monitor the remaining amount in the material container 32. An example of the electric remaining amount detection means includes a means for detecting a change in conductivity of the material container 32, and an example of the electric display means includes a means for using a light-emitting diode disposed on the outer surface of the casing main body 14. As the mechanism for monitoring the remaining amount in the material container 32, a method that optically detects the remaining amount by using a prism may also be employed.

In the flavor generation article shown in FIG. 10, furthermore, a power supply 62 is stored in a power supply holder 66 which is detachably mounted on the casing main body 14 through a connecting portion 68. As the connecting portion 68, a known structure, e.g., a screw or a fitting pair, can be employed. When the power supply holder 66 having a length corresponding to the size of the power supply 62 is used, exchange of the power supply 62 is facilitated, and repair and exchange of members in the casing main body 14 are also facilitated.

FIG. 11 is a schematic view showing a flavor generation article according to still another embodiment of the present invention.

The flavor generation article of this embodiment is similar to the flavor generation article shown in FIG. 10 but is different from it in that a discharge operation lever 76 is connected to an atomizer 86 provided to a discharge port 35. The atomizer 86 can supply a material corresponding to one puffing operation onto a ceramic heater 42 in the form of a liquid splash or liquid drop.

In the flavor generation article shown in FIG. 11, a filler 56 is disposed in a cooling chamber 52. When the filler 56 is disposed, the cooling effect of the gasified flavor component can be promoted, and the pressure loss can be adjusted so that the flavor component can be inhaled with an appropriate pressure. As the filler 56, for example, a fiber formed body made of cellulose acetate or pulp, or a particulate matter, e.g., glass or aluminum particles, can be used.

FIG. 12 is a schematic view showing a flavor generation article according to still another embodiment of the present invention.

The characteristic feature of the flavor generation article of this embodiment resides in that a formed body

92 of a solid material that generates a flavor or the like to be inhaled by the user is detachably disposed in a gas flow path 26 between a ceramic heater 42 and a cooling chamber 52.

The formed body 92 of the solid material can contain an extracted material and/or the constituent components of various types of natural materials in accordance with the application purpose. As the flavor material to be contained by the formed body 92, for example, menthol, caffeine, or a tobacco component, e.g., a tobacco extracted component or a tobacco smoke condensate component can be employed.

If the formed body 92 of the solid material has such a size that no gap is formed between it and the inner surface of a casing main body 14, a formed body 92 having good air permeability is used as the formed body 92. In this case, the gas flow path 26 between air intake ports 24 and a suction port 22 is formed to extend through the formed body 92. On the other hand, if the size of the formed body 92 is set such that a gap is formed between the formed body 92 and the inner surface of the casing main body 14, a formed body 92 having poor or no air permeability can be used. In this case, the gas flow path 26 between the air intake ports 24 and suction port 22 is formed to extend through the gap between the formed body 92 and the inner surface of the casing main body 14.

FIG. 13 is a schematic view showing a flavor generation article according to still another embodiment of the present invention.

The flavor generation article of this embodiment is different from the flavor generation article shown in FIG. 12 in that a coil heater 94 for heating a formed body 92 is disposed around the formed body 92. The heater for heating the formed body 92 may be arranged in a hole formed in the formed body 92.

The coil heater 94, together with a ceramic heater 42, can be controlled by a control circuit 72 so that power is supplied to them in accordance with the inhaling operation of the user. When the formed body 92 has a large heat capacity, however, even if power is supplied to the coil heater 94 in accordance with the start of the inhaling operation of the user, generation of the flavor may be retarded considerably. In such a case, the coil heater 94 may be kept heated when this article is in use, i.e., while a switch 74 is set in the ON state.

The formed body 92 has such a size that a sufficiently large gap is formed between it and the inner surface of a casing main body 14. Accordingly, the major portion of a gas flow path 26 between air intake ports 24 and a suction port 22 extends through this gap.

FIG. 14 is a schematic view showing a flavor generation article according to still another embodiment of the present invention.

The characteristic feature of the flavor generation article according to this embodiment resides in that a swing vane type sensor is used to detect the inhaling operation of the user. More specifically, a swing vane 102 is disposed in a gas flow path 26 between a ceramic heater 42 and a cooling chamber 52. An orifice 112 having an opening 114 opposing the vane 102 is disposed in the gas flow path 26 between the ceramic heater 42 and the vane 102. The vane 102 is integrally connected to a conductive lever 104 which serves as the switch lever of the sensor circuit. An electric contact 108 of the sensor circuit is disposed on the inner surface of a casing main body 14 to oppose the conductive lever 104.

The vane 102 and lever 104 are integrally, swingably, and axially supported on a support 106 on the inner surface of the casing main body 14, and is biased counterclockwise in FIG. 14 by a spring incorporated in the support 106. Accordingly, in an ordinary state, the vane 102 abuts against the orifice 112, and the lever 104 and contact 108 are not in contact with each other. However, when the user starts an inhaling operation, the gas flow, the flow velocity of which is increased by the orifice 112, pivots the vane 102 clockwise in FIG. 14, so that the lever 104 and contact 108 come into contact with each other. The inhaling operation signal of the user which is detected in this manner by the swing vane type sensor is transmitted to a control circuit 72. Based on this detection signal, a discharge drive portion 38 and the ceramic heater 42 can be controlled.

FIG. 15 is a schematic view showing a flavor generation article according to still another embodiment of the present invention.

The characteristic feature of the flavor generation article according to this embodiment resides in that a contact sensor is used in order to detect the inhaling operation of the user. More specifically, electric contacts 122 and 124 each made of an annular conductive plate are disposed at the center and the suction port-side end portion, respectively, of the outer surface of a casing 12. The electric contacts 122 and 124 constitute the switch of a sensor circuit. When the electric contacts 122 and 124 are connected to each other through a conductor, the sensor generates a detection signal. This state occurs when, e.g., two conditions that the user holds the electric contact 122 at the center with his hand and holds the suction port-side electric contact 124 in his mouth are satisfied simultaneously. The inhaling operation signal of the user which is detected by the contact sensor in this manner is transmitted to a control circuit 72. A discharge drive portion 38 and a ceramic heater 42 can be controlled based on this detection signal.

FIG. 16 is a schematic view showing a flavor generation article according to still another embodiment of the present invention.

The flavor generation article of this embodiment has discharge ports 35 of a discharge head 34 that are oriented in the same direction as that of the flavor generation article shown in FIG. 1, and a ceramic heater 42 opposing the discharge ports 35. However, a casing 12 cannot be separated into first and second portions 12a and 12b (see FIG. 1), and a liquid material 36, the dis-

charge head 34, the ceramic heater 42, a power supply 62, a control unit 72, and the like are incorporated in one casing main body 14.

Although no throttle plate 21 (see FIG. 1) is disposed in a gas flow path 26, a support member 44 of the ceramic heater 42 is formed to have a slit only at its central portion corresponding to the discharge head 34. Accordingly, air flowing through air intake ports 26 entirely passes through the gap between the discharge port 35 and the ceramic heater 42.

The characteristic features of the respective portions of the present invention have been described divisionally by way of several embodiments in order to facilitate understanding of the present invention. These characteristic features can be appropriately combined in accordance with the object. More specifically, the present invention can be practiced in various embodiments other than those shown in the drawings within the spirit and scope of the invention.

Claims

1. A flavor generation article characterized by comprising:

   a casing having an air intake port for taking in air therein and a suction port through which a user inhales a flavor, and forming a gas flow path between said intake port and said suction port;
   a material container for storing a liquid material which contains at least a flavor substance and having a discharge port for said material, said material container being mounted on said casing;
   discharge driving means for discharging said material from said container through said discharge port in the form of a liquid drop;
   gasifying means disposed in said gas flow path to receive the liquid drop of said material discharged from said container and gasify said material by electrically heating the liquid drop; and
   a power supply for supplying electric energy to said gasifying means.

2. A flavor generation article according to claim 1, characterized by further comprising a sensor for detecting an inhaling operation of the user and control means for controlling, based on a signal from said sensor, said discharge driving means so as to discharge said material from said container.

3. A flavor generation article according to claim 2, characterized in that said sensor comprises a pressure-sensitive sensor mounted on said casing around said suction port.

4. A flavor generation article according to claim 2 or 3, characterized in that said control means controls said gasifying means based on the signal from said sensor so that said gasifying means generates heat.

5. A flavor generation article according to claim 4, characterized in that said control means controls said gasifying means and said discharge driving means so as to preheat said gasifying means prior to discharge of said material.

6. A flavor generation article according to claim 1, characterized in that said power supply is disposed in said casing.

7. A flavor generation article according to claim 6, characterized in that said casing is constituted by first and second portions that are electrically connected to each other through a cable, said gas flow path, said container, said discharge driving means, and said gasifying means being disposed in said first portion, and said power supply being disposed in said second portion.

8. A flavor generation article according to claim 7, characterized in that said first and second portions of said casing are detachably connected to each other through a connecting portion.

9. A flavor generation article according to claim 1, characterized by further comprising an operation lever for manually operating said discharge driving means.

10. A flavor generation article according to any one of claims 1 to 9, characterized in that said gasifying means comprises a porous layer, and the liquid drop of said material is supplied onto said porous layer.

11. A flavor generation article according to any one of claims 1 to 10, characterized in that said gasifying means is arranged to oppose said discharge port, and a throttle hole for directing air flowing from said air intake port toward a gap between said discharge port and said gasifying means is disposed in said gas flow path.

12. A flavor generation article according to any one of claims 1 to 11, characterized in that said casing is formed with an outer air inlet hole in order to supply an outer air into said gas flow path between said gasifying means and said suction port.

13. A flavor generation article according to any one of claims 1 to 12, characterized by further comprising a formed body of a solid material containing at least

a flavour substance and disposed in said gas flow path so as to be located between said gasifying means and said suction port.

14. A flavor generation article according to claim 13, characterized by further comprising heating means for heating said formed body.

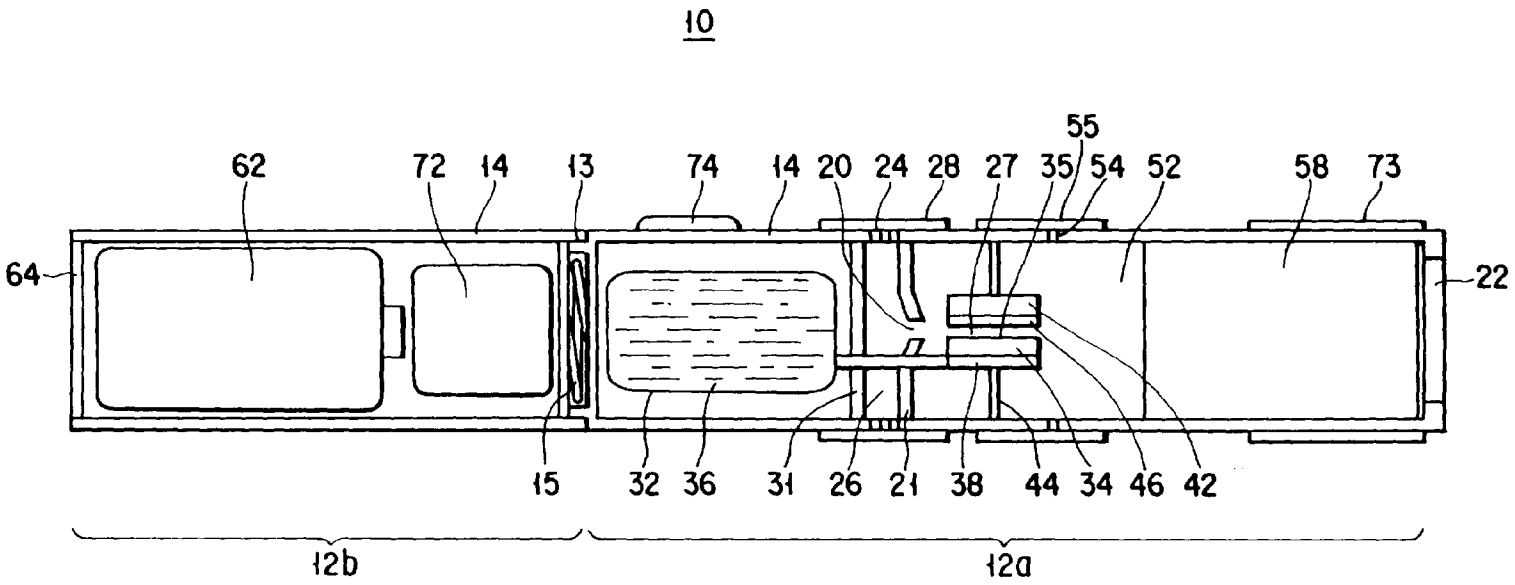

FIG. 1

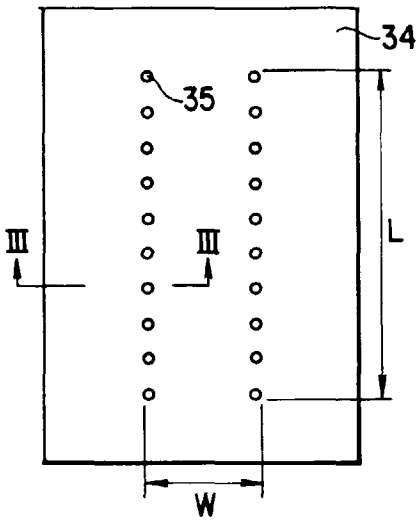

FIG. 2

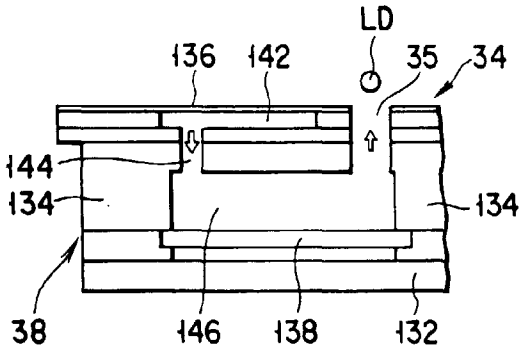

FIG. 3

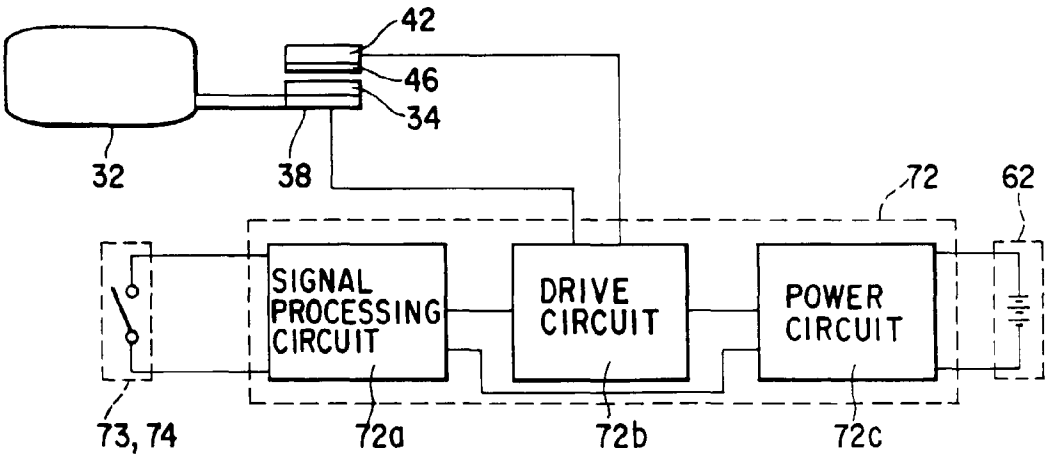

FIG. 4

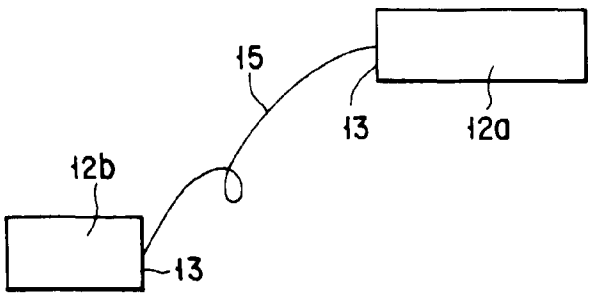

FIG. 5

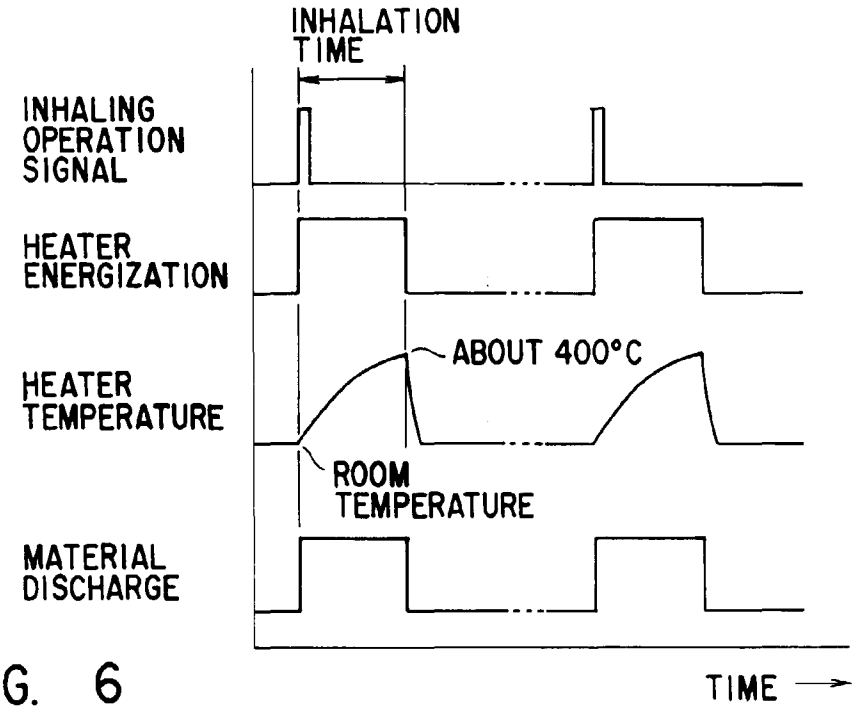

FIG. 6

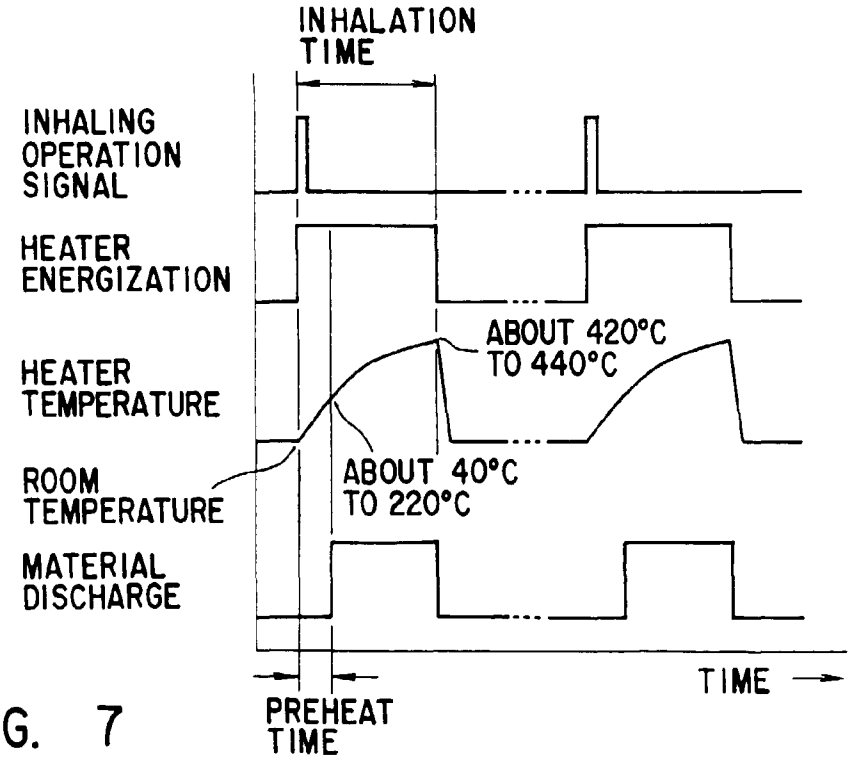

FIG. 7

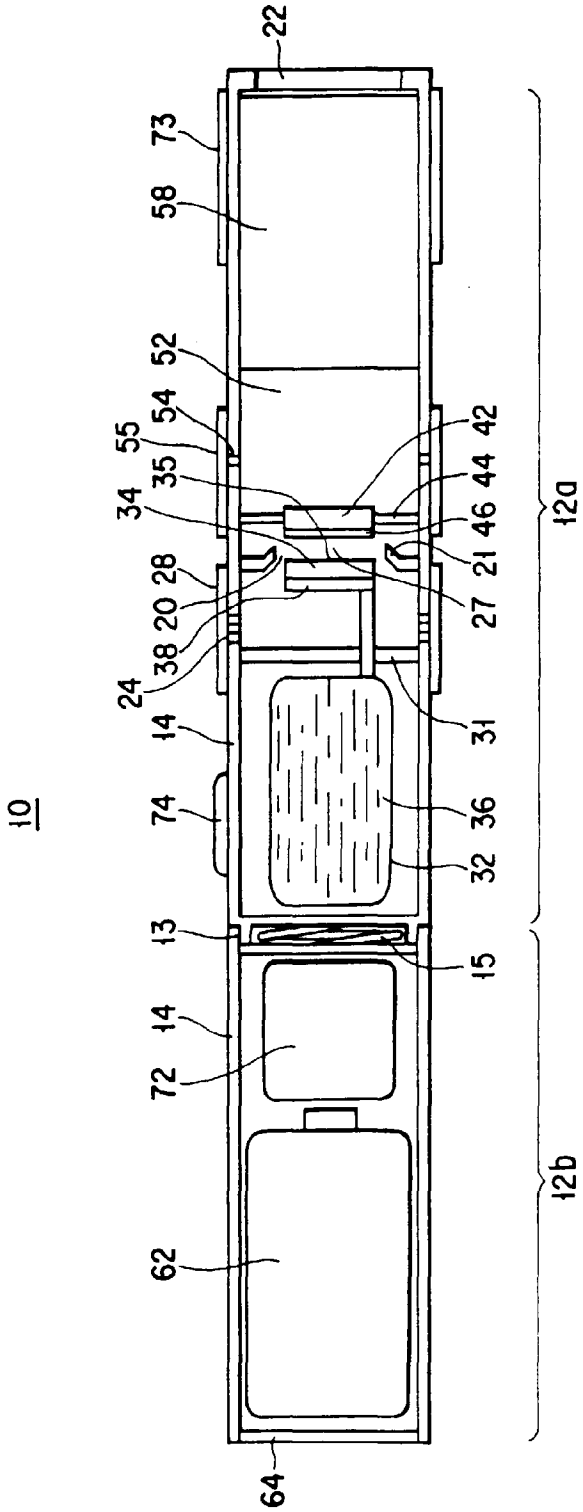

FIG. 8

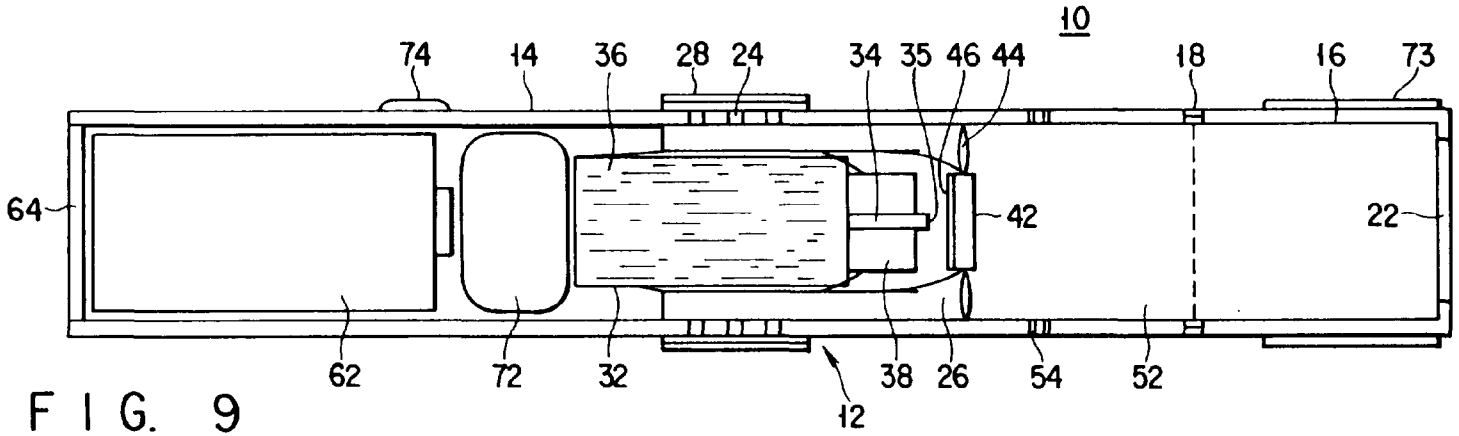

FIG. 9

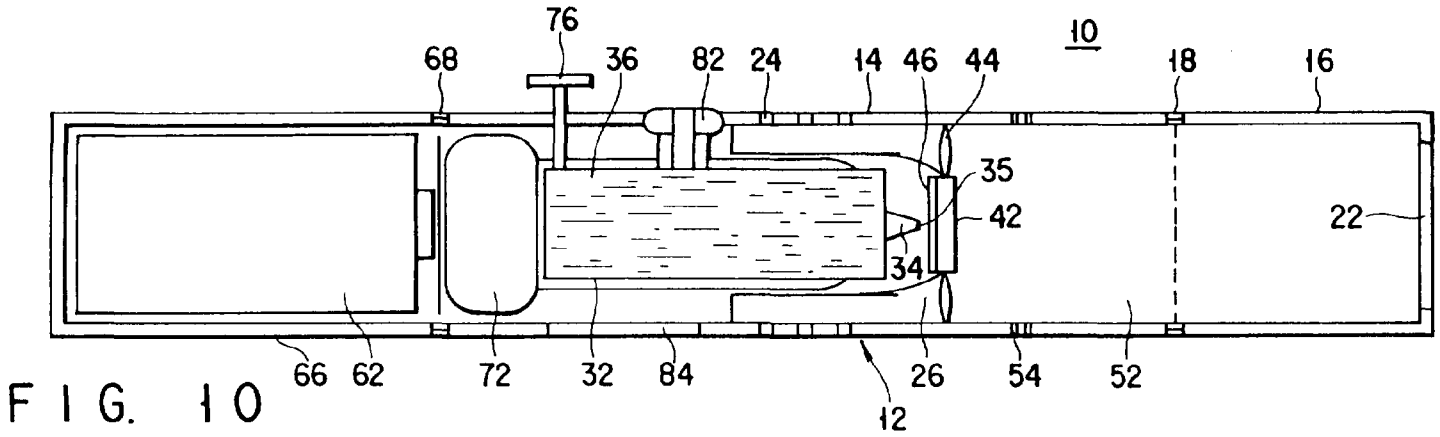

FIG. 10

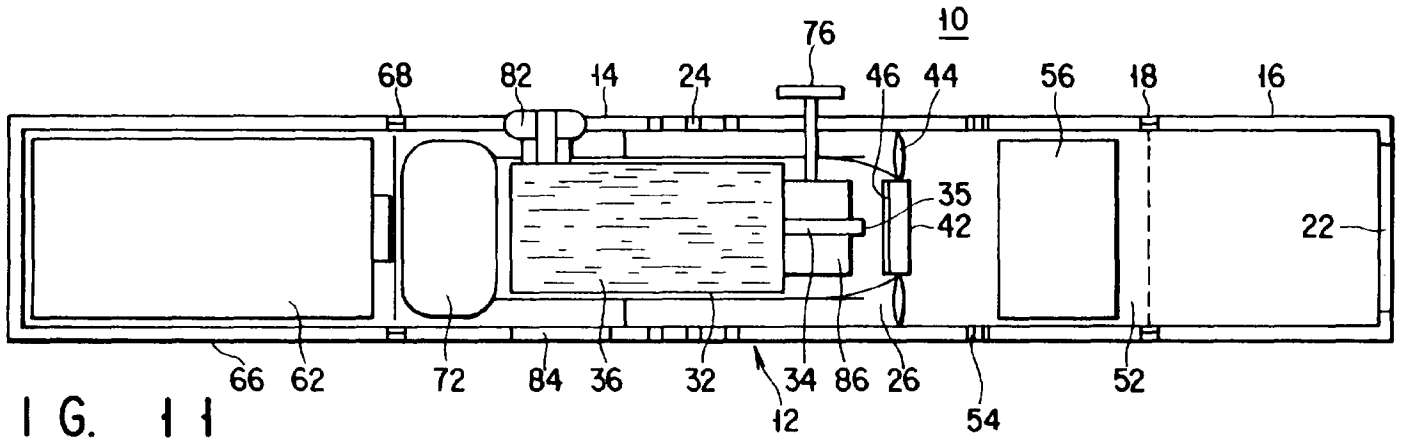

FIG. 11

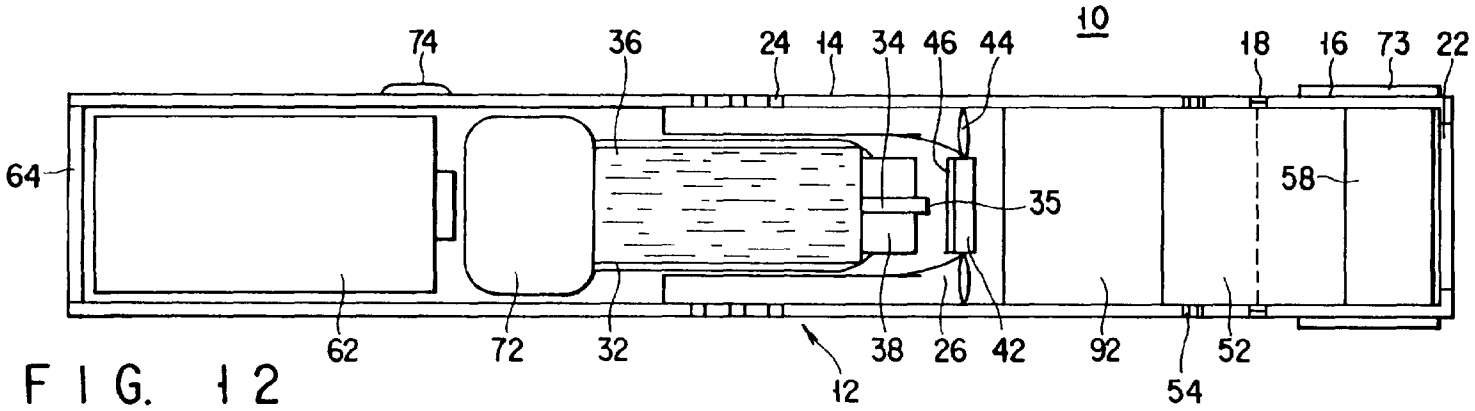

FIG. 12

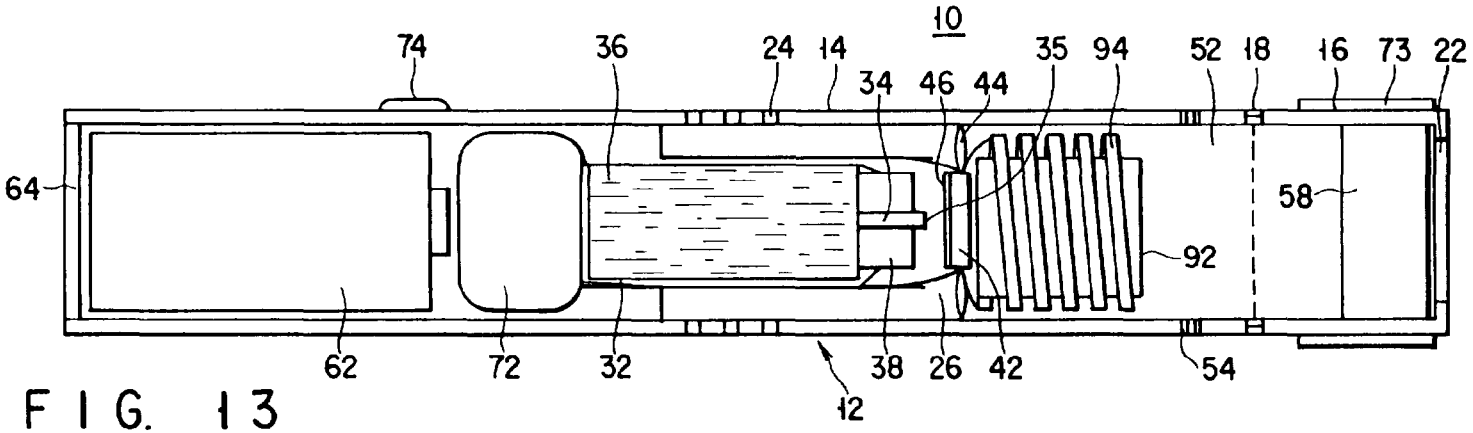

FIG. 13

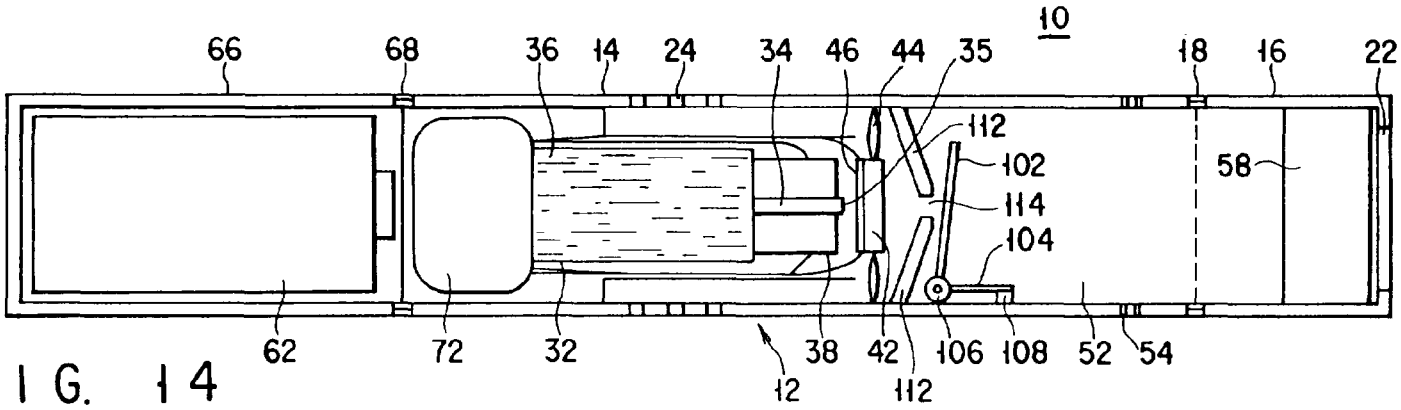

FIG. 14

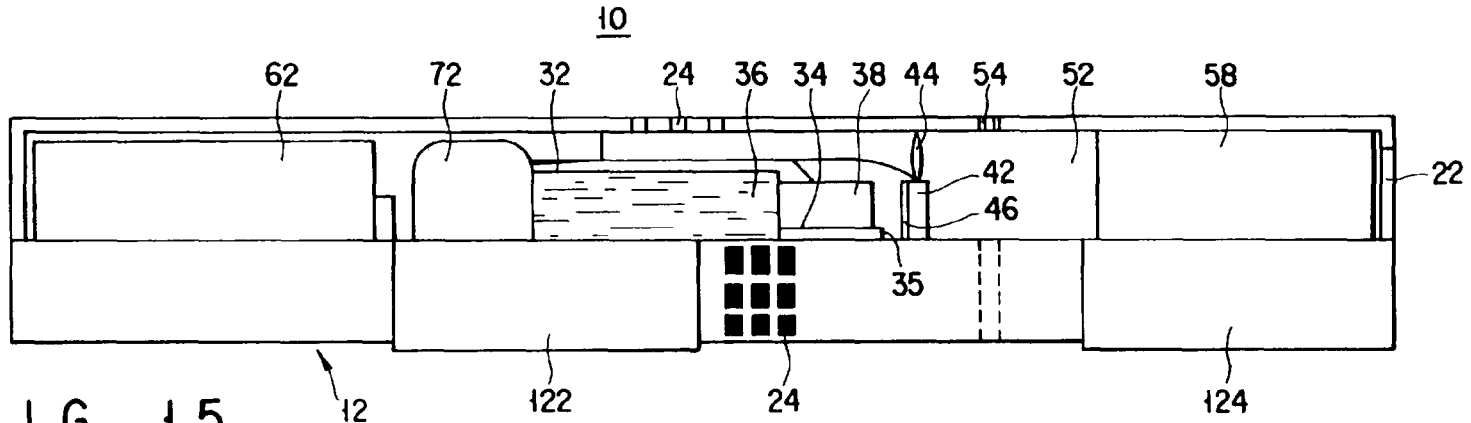

FIG. 15

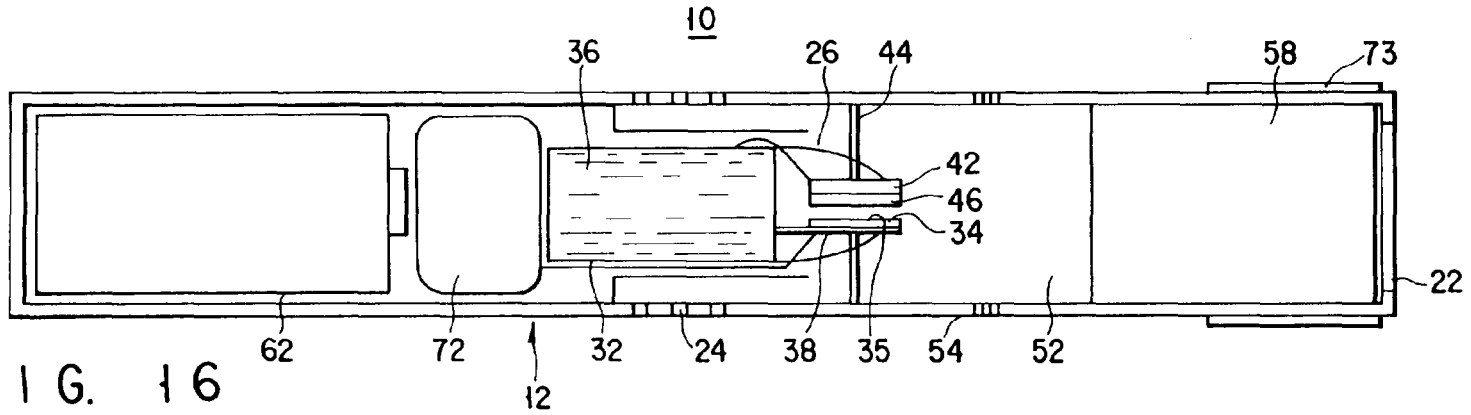

FIG. 16

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP97/01953

A. CLASSIFICATION OF SUBJECT MATTER
Int. Cl^6 A24F47/00 // A61M15/06
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)
Int. Cl^6 A24F47/00, A61M15/06

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.
A	JP, 48-8231, B1 (Kikuo Takeda), March 12, 1973 (12. 03. 73) (Family: none)	1 - 14
A	US, 4303083, A (Robert P. Burruss, Jr.), December 1, 1981 (01. 12. 81) (Family: none)	1 - 14
A	US, 4735217, A (The Procter & Gamble Co.), April 5, 1988 (05. 04. 88) (Family: none)	1 - 14
A	US, 4846199, A (The Regents of the University of California), July 11, 1989 (11. 07. 89) & US, 4945928, A & US, 5316759, A	1 - 14
A	JP, 2-124081, A (R.J. Reynolds Tobacco co.), May 11, 1990 (11. 05. 90) & US, 4922901, A & US, 4947875, A & EP, 358114, A2	1 - 14
A	JP, 2-124082, A (R.J. Reynolds Tobacco Co.), May 11, 1990 (11. 05. 90),	1 - 14

[X] Further documents are listed in the continuation of Box C. [ ] See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier document but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
July 30, 1997 (30. 07. 97)	August 12, 1997 (12. 08. 97)
Name and mailing address of the ISA/ Japanese Patent Office	Authorized officer
Facsimile No.	Telephone No.

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP97/01953

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	& US, 4947874, A & EP, 358002, A2	

Form PCT/ISA/210 (continuation of second sheet) (July 1992)

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	82	"131".clas. and wire with fiber	US-PGPUB; USPAT; USOCR	OR	ON	2011/09/09 14:14
L2	2	"131".clas. and heat with equalizer	US-PGPUB; USPAT; USOCR	OR	ON	2011/09/09 14:20
L3	209	"131".clas. and socket and plug	US-PGPUB; USPAT; USOCR	OR	ON	2011/09/09 14:39
L4	17	"131".clas. and socket and plug and DC	US-PGPUB; USPAT; USOCR	OR	ON	2011/09/09 14:39
L6	1	micyoco and smoking	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/09 15:02
L7	39	micyoco	EPO; JPO; DERWENT	OR	OFF	2011/09/09 15:07
S1	1	12/437511.app.	US-PGPUB; USPAT	OR	OFF	2011/08/30 11:29
S2	1	pan-guocheng.in.	US-PGPUB; USPAT	OR	OFF	2011/08/30 12:06
S3	144	131/273.ccls.	US-PGPUB; USPAT	OR	OFF	2011/08/30 15:18
S4	59	"131".clas. and atomizer	US-PGPUB; USPAT	OR	OFF	2011/09/06 12:13
S5	1	"20100242974"	EPO; JPO; DERWENT	OR	OFF	2011/09/06 12:14
S6	236	"131".clas. and atomiz $5	US-PGPUB; USPAT	OR	OFF	2011/09/06 12:20
S7	104	"131".clas. and atomiz $5 and current	US-PGPUB; USPAT	OR	OFF	2011/09/06 12:20
S8	18	131/273.ccls. and atomiz$3	US-PGPUB; USPAT	OR	OFF	2011/09/06 12:22
S9	19	131/273.ccls. and atomiz$5	US-PGPUB; USPAT	OR	OFF	2011/09/06 12:22
S10	7	131/273.ccls. and atomiz$5 and current	US-PGPUB; USPAT	OR	OFF	2011/09/06 12:22
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S13	1	"131".clas. and micyoco	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/06 12:24

S14	30	micyoco	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/06 12:24
S15	5	"131".clas. and scm	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/06 12:24
S16	1	micyoco and tobacco	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/06 12:26
S17	1	micyoco and cigarette	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/06 12:26
S18	19	"131".clas. and atomiz $5 and DC	US-PGPUB; USPAT	OR	OFF	2011/09/06 12:28
S19	19	"131".clas. and atomiz $5 and DC	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/06 12:28
S20	2	WO-2005099494-$. did.	EPO; JPO; DERWENT	OR	OFF	2011/09/06 12:30
S22	32175	micyoco andf cigarette	EPO; JPO; DERWENT	OR	OFF	2011/09/06 12:31
S23	0	micyoco and cigarette	EPO; JPO; DERWENT	OR	OFF	2011/09/06 12:31
S24	0	micyoco and smoking	EPO; JPO; DERWENT	OR	OFF	2011/09/06 12:31
S25	1	micyoco and smoking	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/06 12:31
S26	4	131/273.ccls. and atomiz$5 and leak$3	US-PGPUB; USPAT	OR	OFF	2011/09/06 12:36
S27	123	"131".clas. and atomiz $5 and (electric or electronic)	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/06 12:37
S28	18	"131".clas. and atomiz $5 and (electric or electronic) and leak$3	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/06 12:37
S29	7	EP-845220-$.did. WO-2009152651-$.did. CN-201379073-$.did. CN-201238610-$.did. CN-201067728-$.did.	EPO; JPO; DERWENT	OR	OFF	2011/09/06 12:41

EAST Search History (Interference)

<This search history is empty>

9/9/2011 3:08:11 PM
C:\Documents and Settings\cszewczyk\My Documents\EAST\Workspaces\12437511.wsp

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12437511	PAN, GUOCHENG
	Examiner	**Art Unit**
	CYNTHIA SZEWCZYK	1741

SEARCHED

Class	Subclass	Date	Examiner
131	273	9/2011	CS

SEARCH NOTES

Search Notes	Date	Examiner
EAST search history	9/2011	CS
Inventor search in EAST and eDAN	9/2011	CS
Assignee search in PALM	9/2011	CS

INTERFERENCE SEARCH

Class	Subclass	Date	Examiner

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	Examiner:
Guocheng Pan	Cynthia Szewczyk
Application No.: 12/437,511	Art Unit: 1741
Filed: May 7, 2009	Confirmation No.: 7646
Title: Electronic Cigarette	

Mail Stop **AMENDMENT**
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

RESPONSE

Sir:

In response to the Office action dated September 15, 2011, please amend the above-identified application as follows:

Amendments to the Specification begin on page 2 of this paper.

Amendments to the Claims are reflected in the listing of claims which begins on page 3 of this paper.

Amendments to the Drawings begin on page 6 of this paper and include both an attached replacement sheet and an annotated sheet showing changes.

Remarks/Arguments begin on page 7 of this paper.

Amendments to the Specification:

Please replace the last full paragraph on page 6 with the following amended paragraph:

-- Referring to Figure 1, the electric power source 5 supplies an electric current to the electronic atomizer 22 and other electric units to heat up the heat equalizer through the connected electronic inhaler and atomizer 22 through the first electric connector ~~11~~ 17 of the inhaler and the second electric connector 21 of atomizer 22. The electric sensor 6 plays the role of detecting the airflow resulted from the puffing action of a user, and wakes up the single chip micyoco 3 to turn on the electricity on/off switch 4 and generate an electric current form the electric power source 5 to the electronic atomizer 22 for vaporizing of a liquid inside the liquid chamber inside the atomizer 22. The single chip micyoco 3 instructs the electric power source 5 to supply electricity to the system by its embedded computer programs when a signal is generated through the airflow detected by the electric sensor 6 from the user's puffing action. --

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) An electronic cigarette ~~comprises~~ comprising a tubular electronic inhaler and a tubular electronic atomizer that is detachably attached to the electronic inhaler, wherein the electronic inhaler includes an electric power source that provides an electric current to the electronic atomizer, and wherein the tubular electronic inhaler includes an electric airflow sensor that is used to turn on and off the electric power source by way of detecting an airflow.

2. (currently amended) An electronic cigarette comprising a tubular electronic inhaler and a tubular electronic atomizer, wherein the electronic inhaler includes an electric power source that provides an electric current to the electronic atomizer, ~~The~~ the electronic cigarette ~~of claim 1,~~ further comprising an integrated circuit board that has a Single Chip Micyoco that controls atomization of a liquid solution.

3. (currently amended) An electronic cigarette comprising a tubular electronic inhaler and a tubular electronic atomizer, wherein the electronic inhaler includes an electric power source that provides an electric current to the electronic atomizer, ~~The~~ the electronic cigarette ~~of claim 1,~~ further comprising an electric airflow ~~censor~~ sensor that is used to turn on and off the electric power source by way of detecting an airflow and sending a signal to ~~the~~ a Single Chip Micyoco, wherein the Single Chip Micyoco receives the signal from the electric airflow sensor, instructs the electric power source to send an electric current to the electronic atomizer, and a time period and a magnitude of the electric current.

4. (currently amended) The electronic cigarette of claim 3, wherein the electric airflow ~~censor~~ sensor is a diaphragm microphone.

5. (original) The electronic cigarette of claim 3, further comprising an LED indicator

inside the electronic inhaler, wherein the LED indicator is connected to the Single Chip Micyoco and the electric power source, and wherein the on time of the LED indicator is controlled by the Single Chip Micyoco.

6. (currently amended) An electronic cigarette comprising a tubular electronic inhaler and a tubular electronic atomizer, wherein the electronic inhaler includes an electric power source that provides an electric current to the electronic atomizer, ~~The electronic cigarette of claim 1,~~ wherein the electronic inhaler includes, sequentially from a first end of the electronic inhaler to the second end, a cigarette cap, an LED indicator, the electric power source, an electric airflow sensor, a circuit board for a Single Chip Micyoco, and a first electric connector.

7. (original) The electronic cigarette of claim 1, wherein the electronic inhaler includes a first electric connector disposed at a second end of the electronic inhaler, wherein the electronic atomizer includes a second electric connector disposed at a first end of the electronic atomizer, and wherein the first electric connector is connected to the second electric connector so that the electronic inhaler and the electronic atomizer form the electronic cigarette.

8. (currently amended) The electronic cigarette of claim 1, wherein the electronic atomizer includes a liquid container having a side-space for airflow, wherein the liquid container includes a medium being ~~socked~~ soaked with a solution to be atomized, and wherein the liquid container prevents or reduces liquid leak and reverse flow.

9. (currently amended) The electronic cigarette of claim 8, wherein the electronic atomizer includes an electric heating wire which generates heat for atomization of the solution ~~socked~~ soaked in the medium inside the liquid container, a heat equalizer onto which the electric heating wire is wired and is made of inorganic fibers that can withstand a temperature up to 2000 degrees centigrade, wherein the heat equalizer ensures that the heat generated by the electric wire is uniform, and a supporting piece that is disposed next to the heat equalizer and is made of a plastic or ceramic material that can withstand a temperature up to 2000 degrees centigrade.

10. (currently amended) The electronic cigarette of claim 9, wherein the electronic atomizer includes a leak-proof member, wherein the leak-proof member and ~~the~~ a second electric connector are closer to the first end of the electronic atomizer than the heat equalizer.

11. (currently amended) The electronic cigarette of claim 1, wherein the electronic atomizer includes, in sequence, a second electric connector, a ~~leaf proof~~ leak-proof piece, a supporting piece, a heat equalizer coupled with an electric heating wire, a fluid container filled with a medium, and an atomizer cap with an air-puffing hole.

12. (original) The electronic cigarette of claim 1, wherein the electric power source is inside the electronic inhaler.

13. (original) The electronic cigarette of claim 10, where the first electric connector is a DC socket and the second electric connector is a DC plug, wherein the DC plug is embedded onto the leak-proof piece through a plug seat, which is connected to the electric heating wire, and wherein the first end of the electronic atomizer is connected to the second of the electronic inhaler by placing the DC plug to the DC socket.

14. (original) The electronic cigarette of claim 13, wherein the first electric connector is a cylinder terminal, and its outskirt is tightly embedded into the second end of the electric inhaler tube and its exposed portion has a screw thread, wherein the second electric connector is a cylinder terminal, which is tightly embedded into the first end of the electronic atomizer and has a screw thread inside the inhaler tube, and wherein the fist electric connector and second electric connector are connected through the screw threads.

Amendments to the Drawings:

One of the attached sheets of drawings includes a change to Fig. 1. This sheet, which includes Fig. 1, replaces the original sheet including Fig. 1. In Fig. 1, reference numeral 11 has been replaced by reference numeral 17.

Another one of the attached sheets of drawings includes changes to Fig. 2. This sheet, which includes Fig. 2, replaces the original sheet including Fig. 2. In Fig. 2, reference numeral 266 and its lead line have been deleted.

A further one of the attached sheets of drawings includes changes to Fig. 6. This sheet, which includes Fig. 6, replaces the original sheet including Fig. 6. In Fig. 6, reference numeral 266 and its lead line have been deleted.

A still further one of the attached sheets of drawings includes changes to Fig. 7. This sheet, which includes Fig. 7, replaces the original sheet including Fig. 7. In Fig. 7, reference numerals 26 and 27 and their respective lead lines have been deleted.

Attachment: Replacement Sheets

Annotated Sheets Showing Changes

REMARKS/ARGUMENTS

Description of Amendments

In this Amendment, Applicant amends the specification, claims and drawings:

Applicant amends the last full paragraph on page 6 of the specification to change the reference numeral for the first electric connector from 11 to 17.

Applicant amends claims 1-4, 6 and 8-11; and rewrites claims 2, 3 and 6 in independent form. The amendments to claim 1 are supported by the application as originally filed (see, for example, original claim 3).

In the amendments to the drawings, Applicant replaces reference numeral 11 in Fig. 1 with reference numeral 17; and deletes reference numeral 266 and its lead line in Fig. 2, reference numeral 266 and its lead line in Fig. 6, and reference numerals 26 and 27 and their respective lead lines in Fig. 7.

Allowed and Allowable Claims

Applicant appreciates that the Examiner has indicated that claims 2-6 would be allowable if they are rewritten to overcome the claim objections and the rejection under 35 U.S.C. §112, second paragraph, and to include all of the limitations of the base claim and any intervening claims. Claims 2-6 have been rewritten to overcome the claim objections and rejections, and have been rewritten in independent form. Accordingly, claims 2-6 are in allowable form.

Objection to the Drawings

The drawings are objected to under 37 CFR 1.84 on various grounds. Applicant has amended the drawings to overcome the objections.

Objection to the Claims

Claim 11 is objected to because of informalities. Applicant has amended claim 11 to correct the informalities.

Rejection under 35 U.S.C. §112, Second Paragraph

Claims 3-5, 8-10, 13 and 14 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

Applicant has amended the claims to overcome the rejections.

Rejection under 35 U.S.C. §102

Claims 1, 7, 8, 11 and 12 were rejected under 35 U.S.C. §102(b) as being anticipated by Susa (EP 0845220 A1). For the following reasons, Applicant respectfully requests reconsideration and withdrawal of the rejection with respect to the amended claims.

Independent claim 1, as amended, recites an electronic cigarette that includes a tubular electronic inhaler and a tubular electronic atomizer that is detachably attached to the tubular electronic inhaler, wherein the tubular electronic inhaler includes an electric airflow sensor that is used to turn on and off the electric power source by way of detecting an airflow. The cited reference, Susa, does not disclose these limitations.

Susa discloses a flavor generation article that includes first and second portions (12a, 12b). The first portion (12a) includes a container (32) for store liquid (36), a heater (42) to vaporize the liquid, an air intake (24) for air to enter the first portion (12a), and a suction port (22) for air to exit the first portion (12a). The second portion (12b) includes a power source (62) and a control circuit (72).

If the first portion (12a) of Susa is considered as the electronic atomizer of claim 1 and if the second portion (12b) of Susa is considered as the electronic inhaler of claim 1, then the second portion (12b) of Susa does not include an electric airflow sensor that is used to turn on and off the electric power source by way of detecting an airflow. Furthermore, since both the air intake and suction port are part of the first portion (12a) in Susa, a person of ordinary skill in the art would not put an electric airflow sensor in the second portion (12b) of Susa. Therefore, Susa does not anticipate independent claim 1. Susa also does not anticipate claims 7, 8, 11 and 12 because they depend from claim 1.

Rejection under 35 U.S.C. §103(a)

Claims 9, 10, 13 and 14 were rejected under 35 U.S.C. §103(a) as being unpatentable over Susa.

As discussed above, Susa does not teach or suggest every limitation of claims 1 and 8. Therefore, the Office Action has not established that Susa teaches or suggests every element of claims 9, 10, 13 and 14, which depend from claims 1 and 8. Consequently, Susa does not render claims 9, 10, 13 and 14 unpatentable.

In light of the foregoing remarks, this application is considered to be in condition for allowance, and early passage of this case to issue is respectfully requested. If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 07-1850.

Respectfully submitted,

Date: November 11, 2011

/Song Zhu, Reg. No. 44,420/

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Telephone (415) 954-0241
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Song Zhu, Ph.D.
Attorney for Applicant
Reg. No. 44,420

Replacement Drawing Sheets

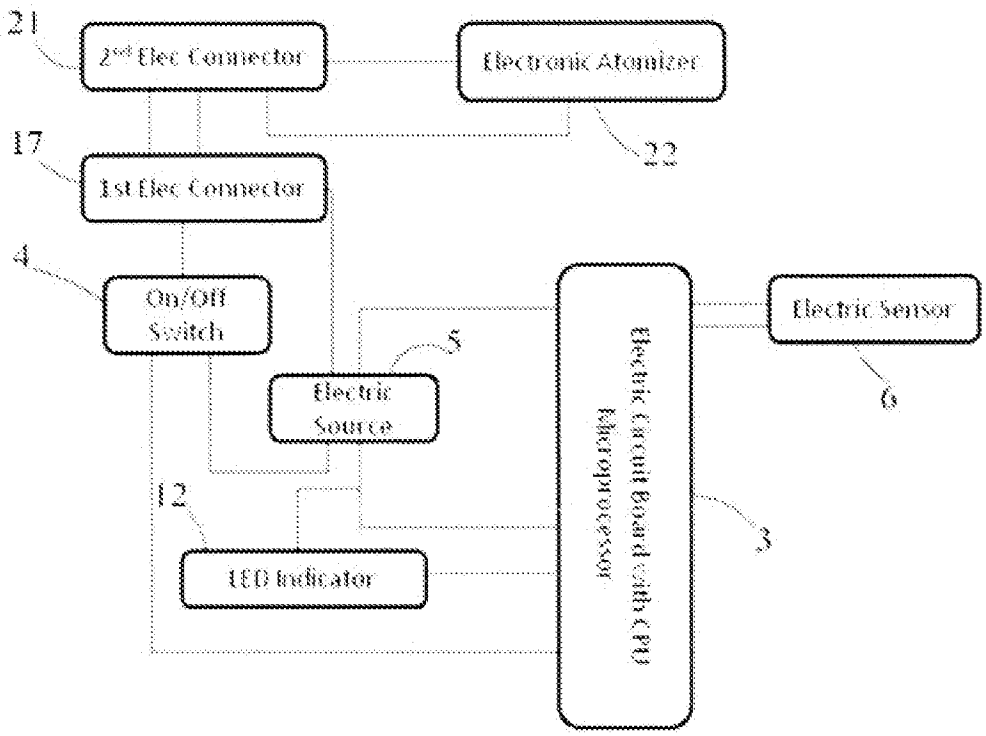
21
2nd Elec Connector
Electronic Atomizer
22
17
1st Elec Connector
4
On/Off Switch
5
Electric Source
12
LED Indicator
Electric Circuit Board with CPU Microprocessor
3
Electric Sensor
6

Figure 1

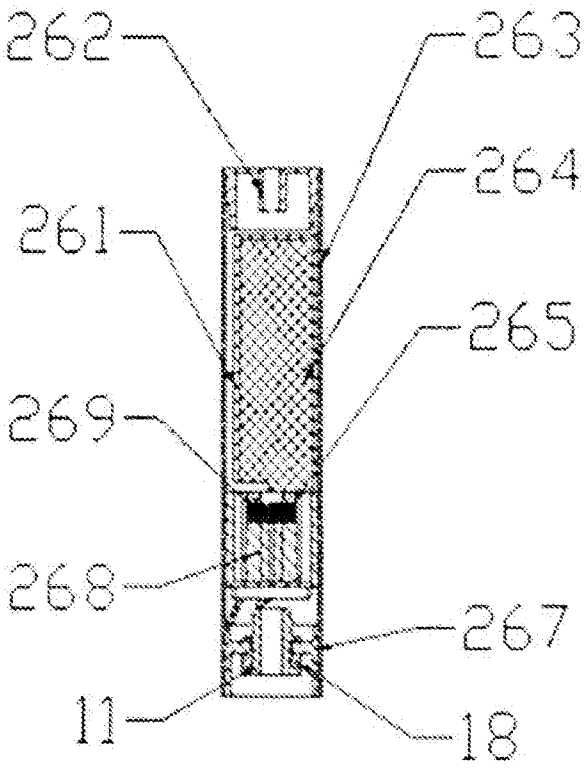

Figure 2

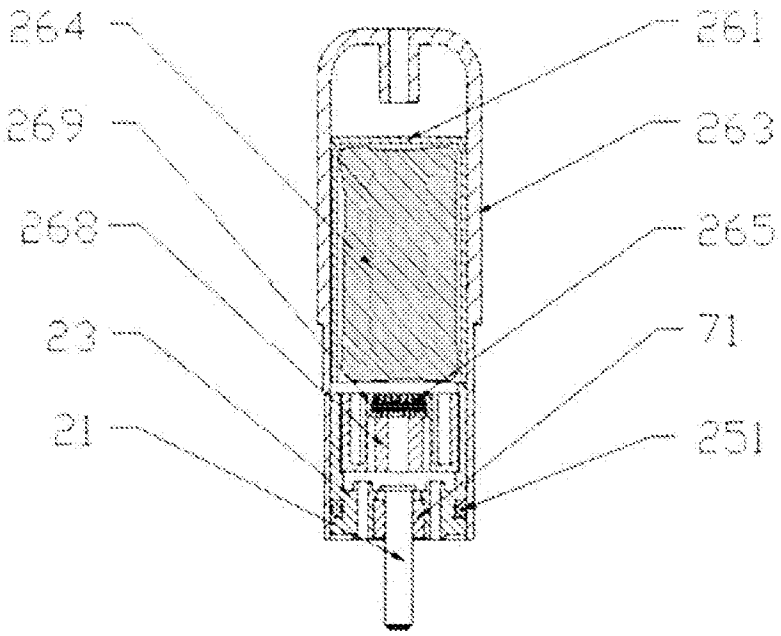

Figure 3

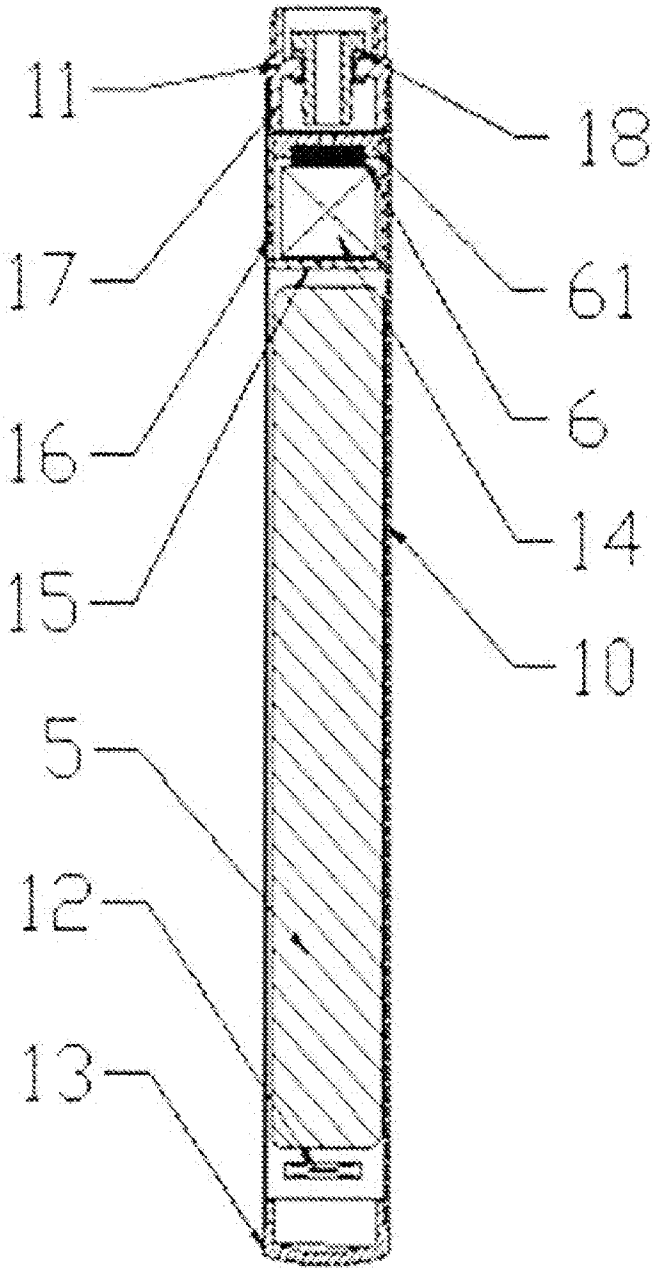

Figure 4

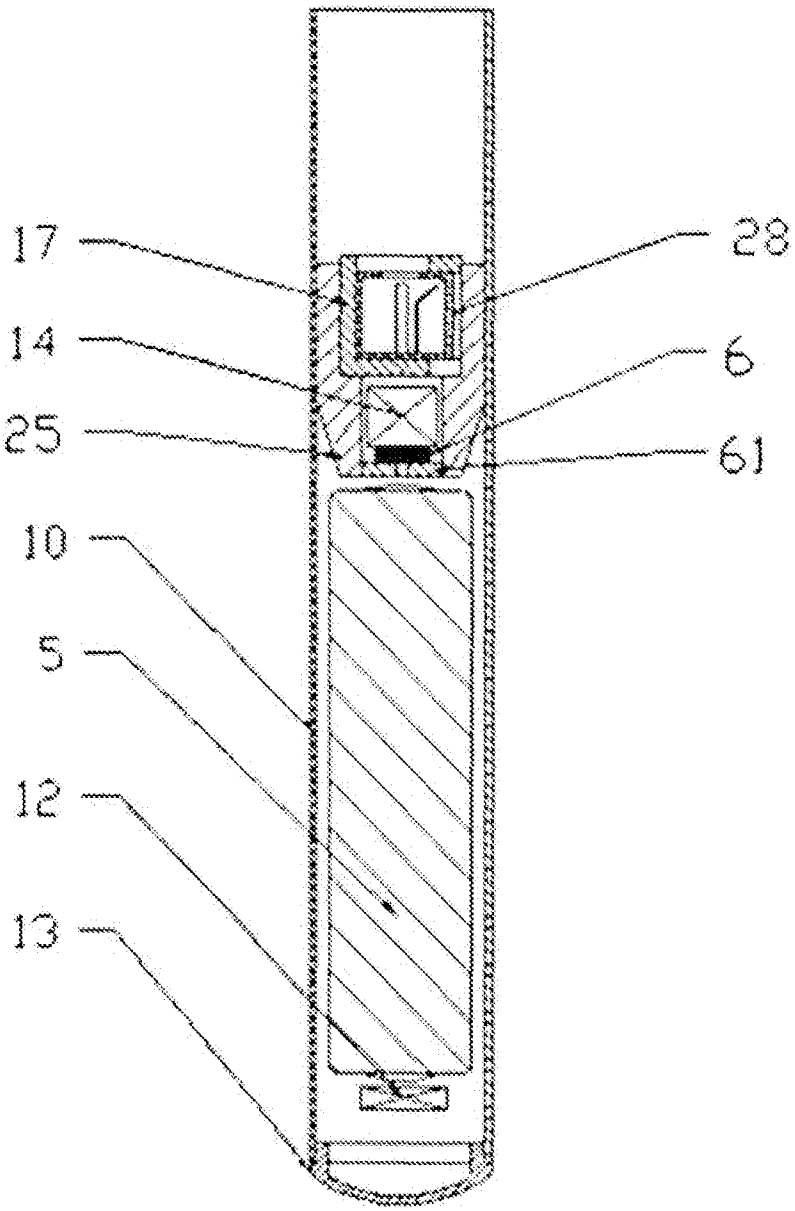

Figure 5

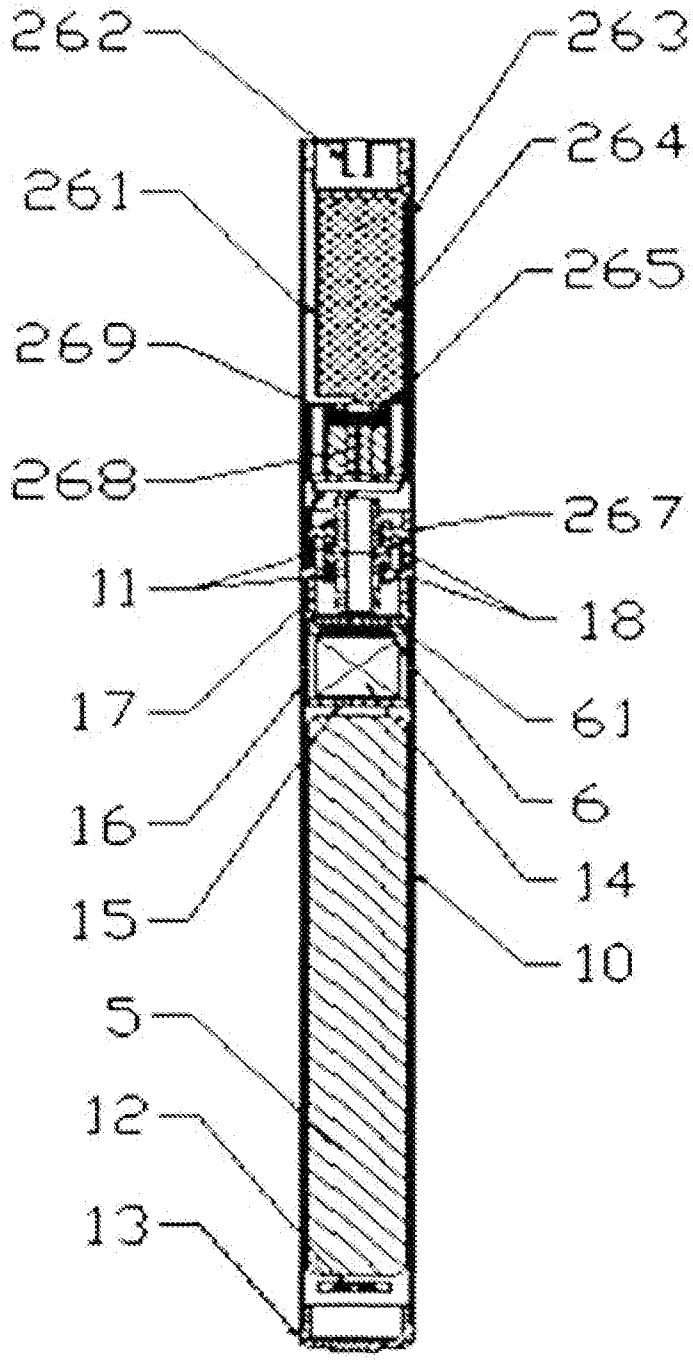

Figure 6

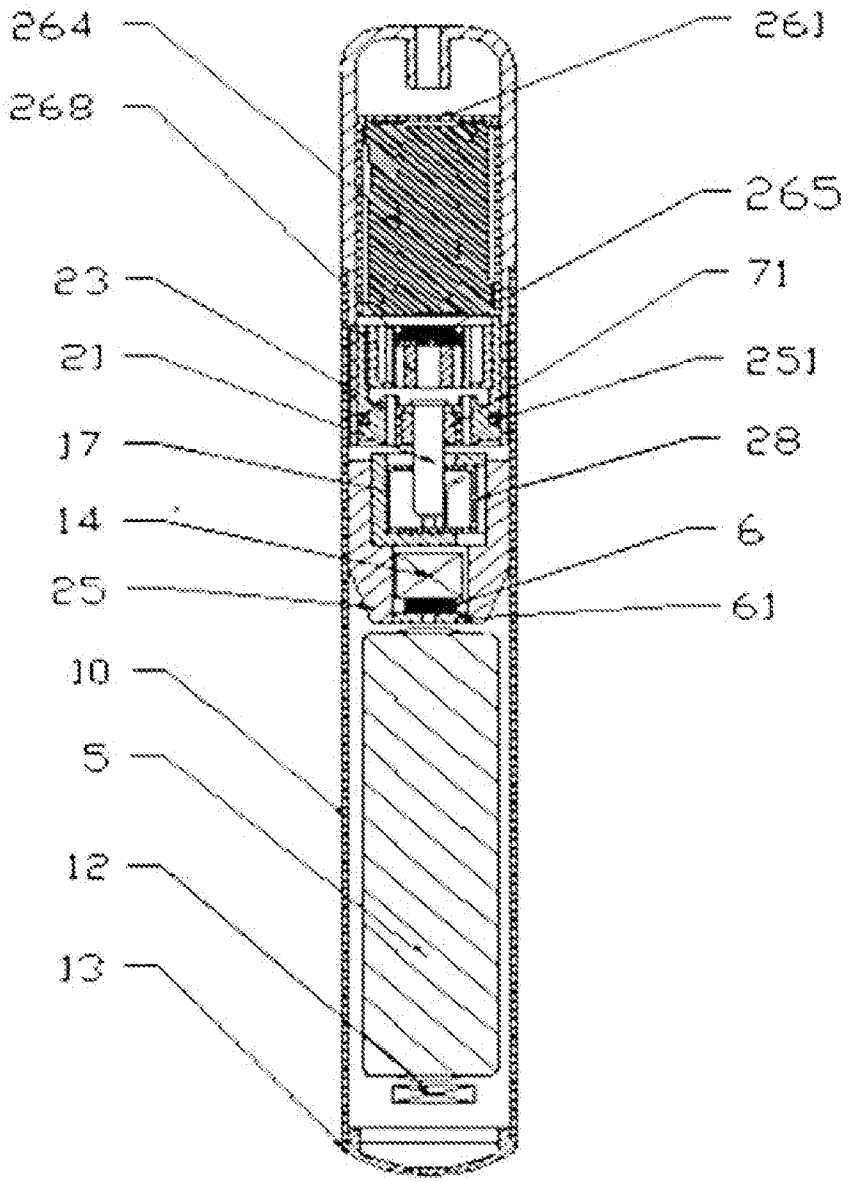

Figure 7

Annotated Sheets Showing Changes

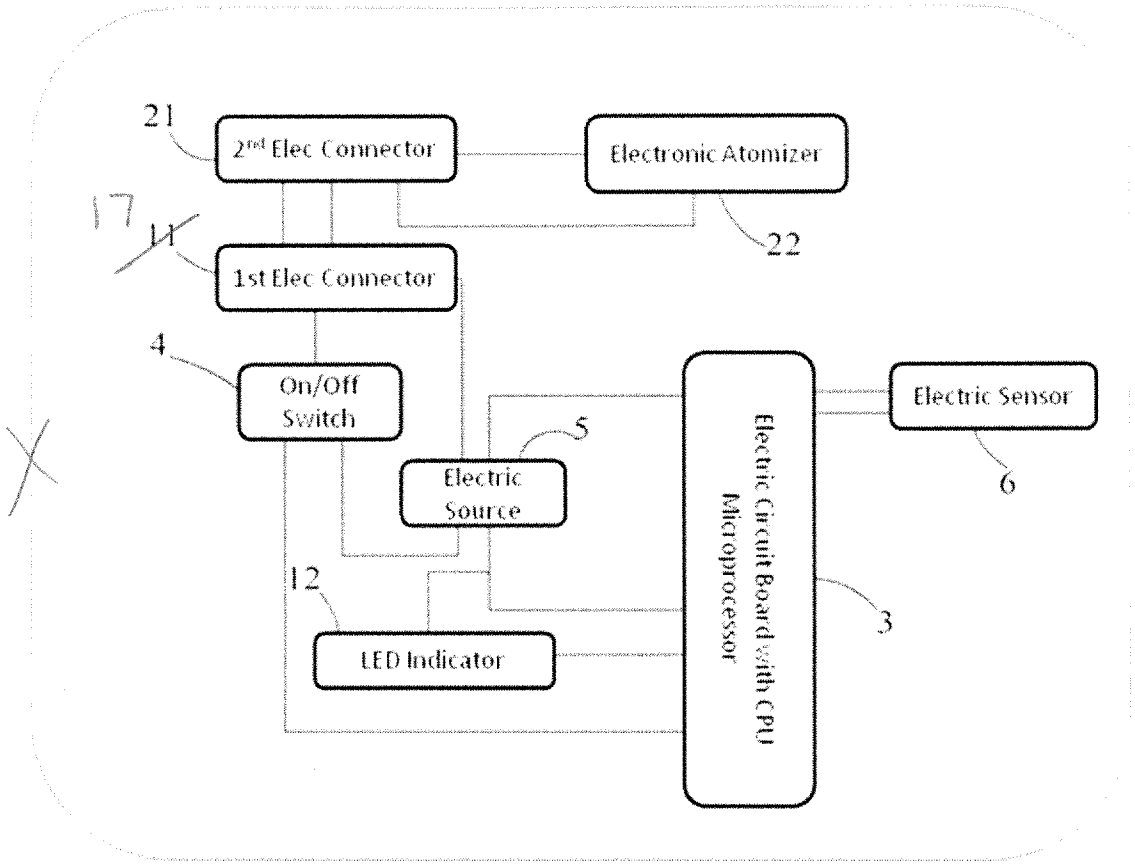

Figure 1

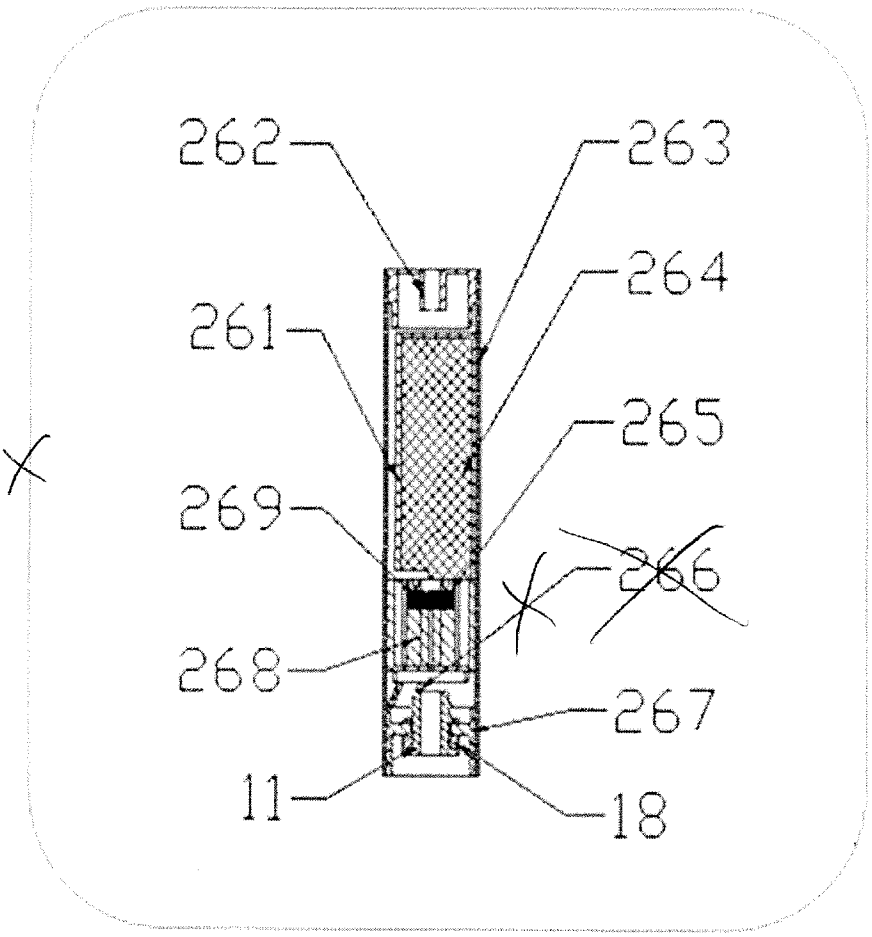

Figure 2

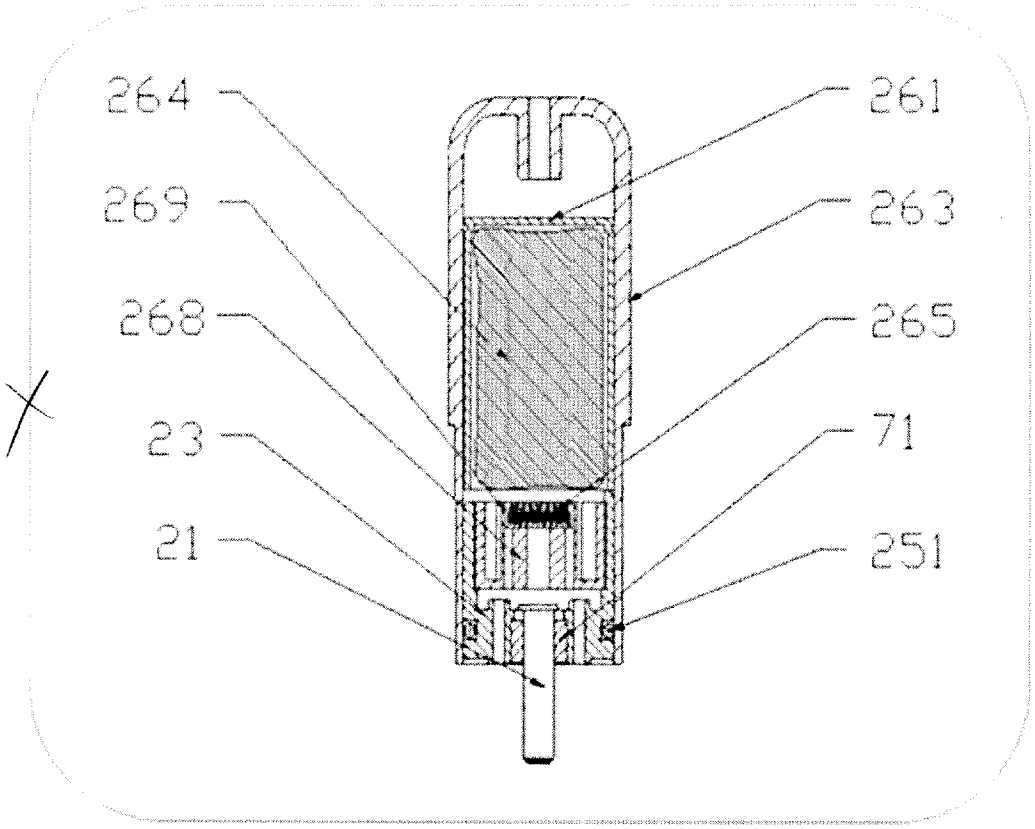

Figure 3

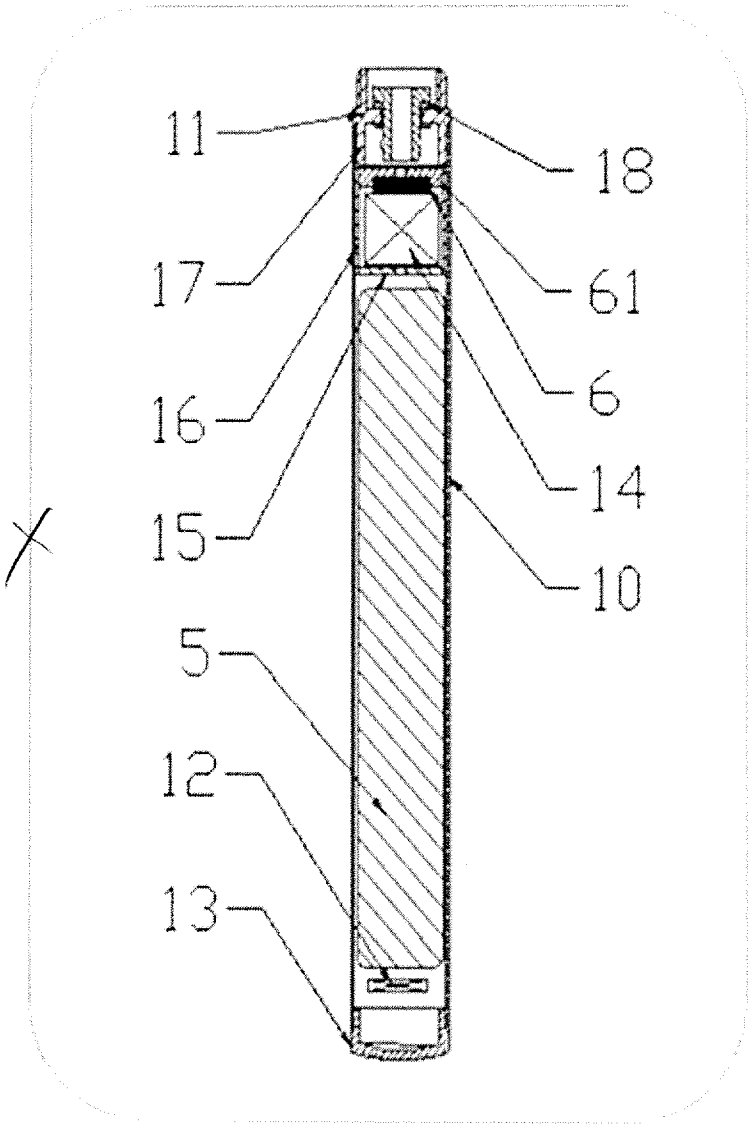

Figure 4

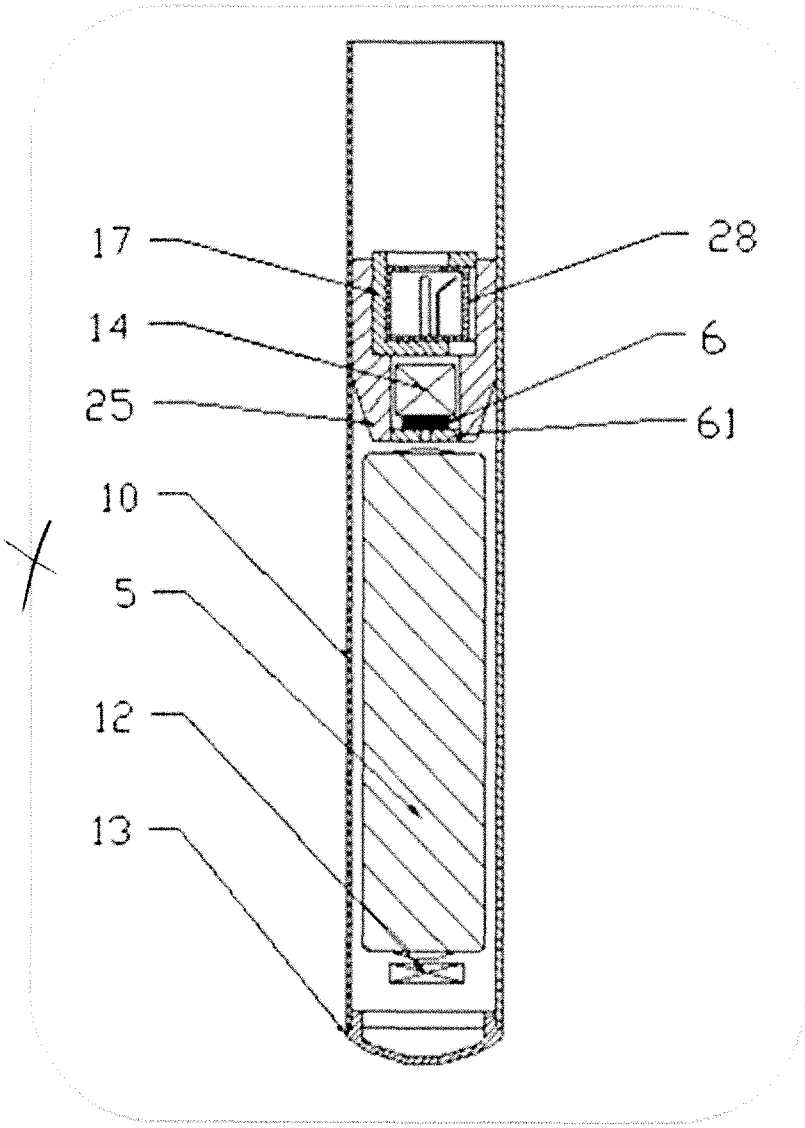

Figure 5

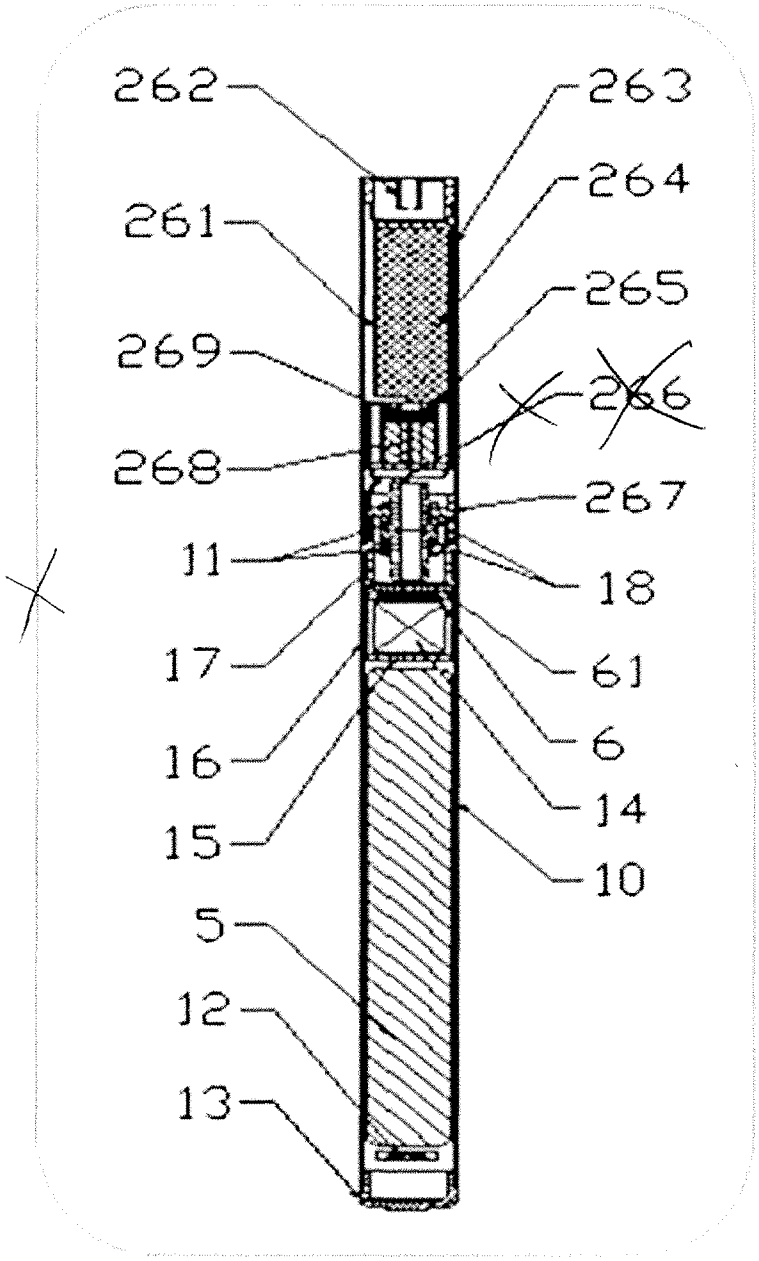

Figure 6

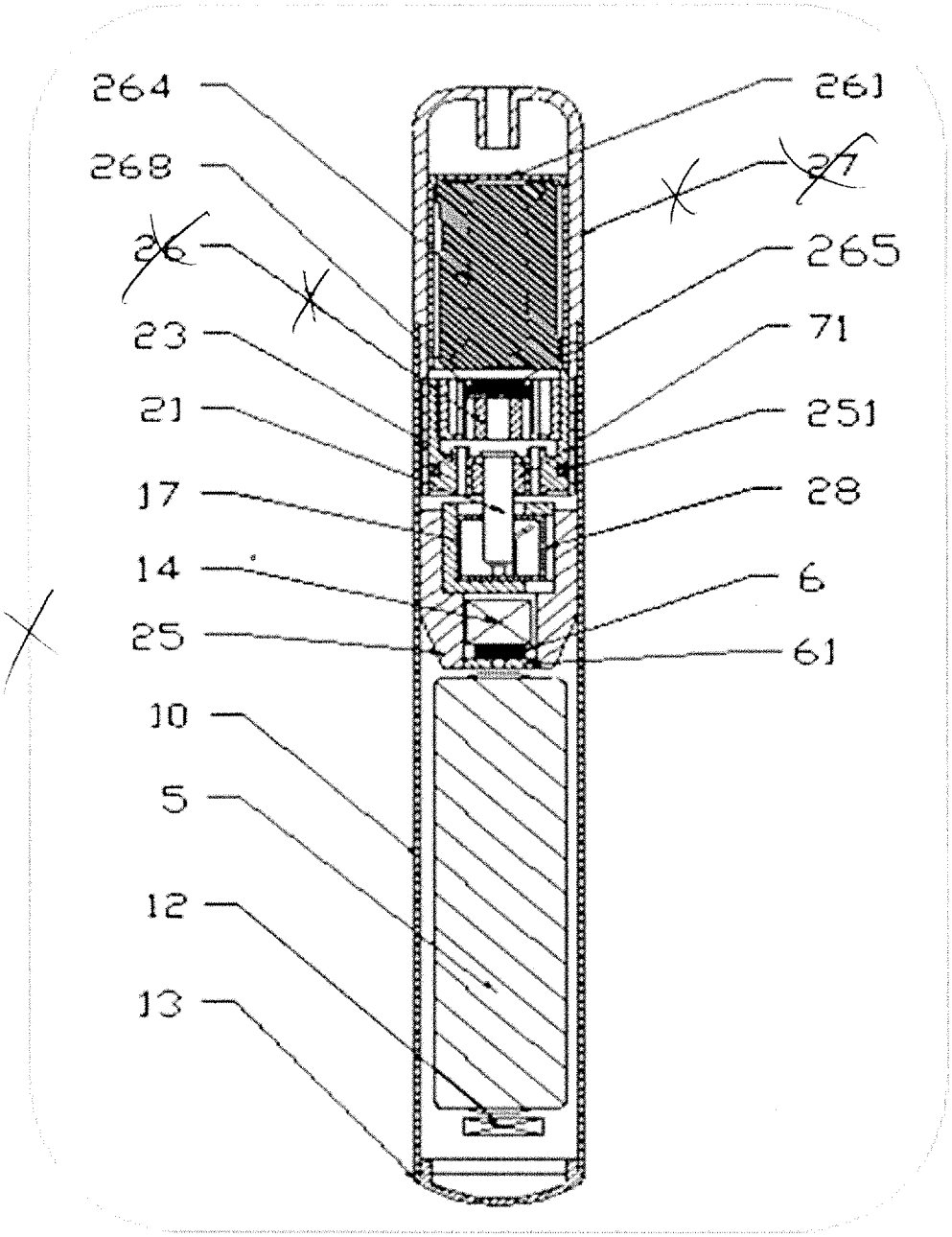

Figure 7

Electronic Acknowledgement Receipt

EFS ID:	11392855
Application Number:	12437511
International Application Number:	
Confirmation Number:	7646
Title of Invention:	Electronic Cigarette
First Named Inventor/Applicant Name:	Guocheng Pan
Customer Number:	44955
Filer:	Song Zhu
Filer Authorized By:	
Attorney Docket Number:	104372.00002
Receipt Date:	11-NOV-2011
Filing Date:	07-MAY-2009
Time Stamp:	20:00:47
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Amendment/Req. Reconsideration-After Non-Final Reject	104372_2_Response_to_9_15_2011_OA.pdf	1045324 f65b6d43d8ea9f4809f7500ecd7b21665e8de76c	no	25

Warnings:	
Information:	

Total Files Size (in bytes):	1045324

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
12/437,511	05/07/2009	

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY ☒ RATE ($)	SMALL ENTITY ☒ FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
☒ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	82		N/A	
☒ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	270		N/A	
☒ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	110		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	14 minus 20 =	* 0	X $26 =	0	OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	1 minus 3 =	* 0	X $110 =	0		X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	462		TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT 11/11/2011

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 14	Minus	** 20	= 0	X $30 =	0	OR	X $ =	
Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $125 =	0	OR	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE	0	OR	TOTAL ADD'L FEE	

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)	OR	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/DIANE JOHNSON/

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/437,511	05/07/2009	Guocheng Pan	104372.00002	7646

44955 7590 12/22/2011

SQUIRE, SANDERS & DEMPSEY (US) LLP
275 BATTERY STREET, SUITE 2600
SAN FRANCISCO, CA 94111-3356

EXAMINER	
SZEWCZYK, CYNTHIA	

ART UNIT	PAPER NUMBER
1741	

MAIL DATE	DELIVERY MODE
12/22/2011	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	12/437,511	PAN, GUOCHENG	
	Examiner	Art Unit	
	CYNTHIA SZEWCZYK	1741	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 November 2011*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

5)☒ Claim(s) *1-14* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☒ Claim(s) *2-6* is/are allowed.

7)☒ Claim(s) *1 and 7-14* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☒ The drawing(s) filed on *11 November 2011* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

12)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 1, 7, and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by COUNTS et al. (US 5,060,671).

COUNTS teaches a electronic cigarette comprising a tubular inhaler (31 in figure 4) and a tubular electronic atomizer (11 in figure 4) that is detachablv attached to the electronic inhaler (see figure 4), wherein the electronic inhaler (31) includes an electric power source (121 in figure 4) that provides an electric current to the electronic atomizer, and wherein the tubular electronic inhaler includes an electric airflow sensor (col. 5, lines 10-28; 127 in figure 4) that is used to turn on and off the electric power source by way of detecting an airflow.

Regarding claim 7, Counts teaches that the electronic inhaler includes a first electric connector (120 in figure 4) disposed at a second end of the electronic inhaler, wherein the electronic atomizer includes a second electric connector (114 in figure 4) disposed at a first end of the electronic atomizer, and wherein the first electric connector is connected to the second electric connector so that the electronic inhaler and the electronic atomizer form the electronic cigarette (col. 3 line 63 – col. 4 line 2).

Regarding claim 12, COUNTS teaches that the electric power source (121 in figure 4) is inside the electronic inhaler (31 in figure 4).

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 8-11, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over COUNTS et al. (US 5,060,671) in view of SUSA et al. (EP 0845220 A1).

COUNTS teaches a electronic cigarette having a tubular inhaler (31 in figure 4) and a tubular electronic atomizer (11 in figure 4) that is detachablv attached to the electronic inhaler (see figure 4). COUNTS teaches that the heater and flavor generating medium can be substituted with a variety of other heater configurations (col. 5 lines 53-66). COUNTS is silent to the heater having container for the flavor generating medium.

SUSA teaches an electronic cigarette comprising a tubular electronic inhaler (12) and a tubular electronic atomizer (col. 2 lines 34-35), wherein the electronic inhaler includes an electric power source that provides an electric current to the electronic atomizer (col. 2 lines 38-39). SUSA teaches the electronic atomizer includes a liquid container (32) having a side-space for airflow (see figure 1), wherein the liquid container includes a medium being soaked with a solution to be atomized (col. 5 lines 51-58). It would have been obvious to one of ordinary skill in the art that the atomizer arrangement of SUSA could have been substituted into the atomizer of COUNTS because the arrangement of SUSA would be able to contain a greater amount of flavor

generating medium and would last longer than the current arrangement of COUNTS.

Regarding claim 9, SUSA teaches that the electronic atomizer includes an electric heating wire (94 in figure 13), a heat equalizer (46) onto which the electric heating wire is wired and is made of inorganic fibers (col. 7 line 56-col. 8 line 9), and a supporting piece (44) that is disposed next to the heat equalizer. It would have been obvious to one of ordinary skill in the art that the supporting piece could have been made of ceramic material because SUSA teaches that the supporting piece helps support the ceramic heater (col. 7 lines 29-32) wherein one of ordinary skill in the art would recognize that since SUSA suggests ceramic for the heater, it would also be available to be used for the supporting piece.

Regarding claim 10, SUSA teaches that the electronic atomizer includes a ceramic heater (42) which would be considered a leak-proof member.

Regarding claim 11, SUSA teaches the electronic atomizer includes an electric connector (92 in figure 13), a ceramic heater (42) which would be considered a leak-proof piece, a supporting piece (44), a heat equalizer (46) coupled with an electric heating wire (94), a fluid container (32) filled with a medium (36), and an atomizer cap with an air-puffing hole (38).

Regarding claim 13, COUNTS teaches that the atomizer and tubular inhaler are attached via contact plugs and sockets (col. 3 lines 64-67). It would have been obvious to one of ordinary skill in the art that the plug and socket could have been a DC plug and DC socket because SUSA teaches that it is known in the art to use DC power in electronic cigarettes (col. 8 lines 40-44) and

COUNTS teaches that the power source may be a variety of possibilities (col. 9 lines 52-67).

Regarding claim 14, COUNTS teaches that the plugs and sockets are cylindrical terminals (see figures). SUSA teaches that two parts of an electric cigarette can be connected via a screw-type structure (col. 5 lines 26-28).

Allowable Subject Matter

5. Claims 2-6 are allowed.

6. Claims 2-6 teach that the electronic cigarette includes a Single Chip Micyoco to control the atomization. Although SUSA teaches using a circuit board to control the operation, SUSA does not teach or suggest specifically using a Single Chip Micyoco to control the atomization in the electronic cigarette. “Single Chip Micyoco” has been interpreted to be a type of chip, and not a trademark. If the term "Single Chip Micyoco” is actually a trademark, then it must be replaced with generic terminology for the chip having that trademark to avoid a rejection under 35 USC 112, second paragraph.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CYNTHIA SZEWCZYK whose telephone number is (571)270-5130. The examiner can normally be reached on Monday through Friday 9 am to 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Daniels can be reached on (571) 272-2450. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CS

/Matthew J. Daniels/
Supervisory Patent Examiner, Art Unit 1741

Notice of References Cited	Application/Control No. 12/437,511	Applicant(s)/Patent Under Reexamination PAN, GUOCHENG	
	Examiner CYNTHIA SZEWCZYK	Art Unit 1741	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-5,060,671	10-1991	Counts et al.	131/329
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	1	12/437511.app.	US-PGPUB; USPAT	OR	OFF	2011/08/30 11:29
S2	1	pan-guocheng.in.	US-PGPUB; USPAT	OR	OFF	2011/08/30 12:06
S3	144	131/273.ccls.	US-PGPUB; USPAT	OR	OFF	2011/08/30 15:18
S4	59	"131".clas. and atomizer	US-PGPUB; USPAT	OR	OFF	2011/09/06 12:13
S5	1	"20100242974"	EPO; JPO; DERWENT	OR	OFF	2011/09/06 12:14
S6	236	"131".clas. and atomiz $5	US-PGPUB; USPAT	OR	OFF	2011/09/06 12:20
S7	104	"131".clas. and atomiz $5 and current	US-PGPUB; USPAT	OR	OFF	2011/09/06 12:20
S8	18	131/273.ccls. and atomiz$3	US-PGPUB; USPAT	OR	OFF	2011/09/06 12:22
S9	19	131/273.ccls. and atomiz$5	US-PGPUB; USPAT	OR	OFF	2011/09/06 12:22
S10	7	131/273.ccls. and atomiz$5 and current	US-PGPUB; USPAT	OR	OFF	2011/09/06 12:22
S11	1	"20080092912".pn.	US-PGPUB; USPAT	OR	OFF	2011/09/06 12:23
S12	1	"131".clas. and micyoco	US-PGPUB; USPAT	OR	OFF	2011/09/06 12:24
S13	1	"131".clas. and micyoco	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/06 12:24
S14	30	micyoco	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/06 12:24
S15	5	"131".clas. and scm	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/06 12:24
S16	1	micyoco and tobacco	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/06 12:26
S17	1	micyoco and cigarette	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/06 12:26
S18	19	"131".clas. and atomiz $5 and DC	US-PGPUB; USPAT	OR	OFF	2011/09/06 12:28
S19	19	"131".clas. and atomiz $5 and DC	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/06 12:28

S20	2	WO-2005099494-$.did.	EPO; JPO; DERWENT	OR	OFF	2011/09/06 12:30
S22	32175	micyoco andf cigarette	EPO; JPO; DERWENT	OR	OFF	2011/09/06 12:31
S23	0	micyoco and cigarette	EPO; JPO; DERWENT	OR	OFF	2011/09/06 12:31
S24	0	micyoco and smoking	EPO; JPO; DERWENT	OR	OFF	2011/09/06 12:31
S25	1	micyoco and smoking	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/06 12:31
S26	4	131/273.ccls. and atomiz$5 and leak$3	US-PGPUB; USPAT	OR	OFF	2011/09/06 12:36
S27	123	"131".clas. and atomiz $5 and (electric or electronic)	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/06 12:37
S28	18	"131".clas. and atomiz $5 and (electric or electronic) and leak$3	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/06 12:37
S29	7	EP-845220-$.did. WO-2009152651-$.did. CN-201379073-$.did. CN-201238610-$.did. CN-201067728-$.did.	EPO; JPO; DERWENT	OR	OFF	2011/09/06 12:41
S30	82	"131".clas. and wire with fiber	US-PGPUB; USPAT; USOCR	OR	ON	2011/09/09 14:14
S31	2	"131".clas. and heat with equalizer	US-PGPUB; USPAT; USOCR	OR	ON	2011/09/09 14:20
S32	209	"131".clas. and socket and plug	US-PGPUB; USPAT; USOCR	OR	ON	2011/09/09 14:39
S33	17	"131".clas. and socket and plug and DC	US-PGPUB; USPAT; USOCR	OR	ON	2011/09/09 14:39
S34	1	micyoco and smoking	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/09 15:02
S35	39	micyoco	EPO; JPO; DERWENT	OR	OFF	2011/09/09 15:07
S36	9965	SCM	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/12 09:41
S37	632	SCM with chip	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/12 09:41
S38	53	SCM near chip	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/12 09:51
S39	15	micyoco.clm.	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/12 10:20
S40	5	"131".clas. and SCM	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/12 10:26

S41	3	"131".clas. and single adj chip	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/12 10:27
S42	24	tobacco and single adj chip	EPO; JPO; DERWENT	OR	OFF	2011/09/12 10:41
S43	17	cigarette and single adj chip	EPO; JPO; DERWENT	OR	OFF	2011/09/12 10:43
S44	1	cigarette and SCM NOT S42 NOT S43	EPO; JPO; DERWENT	OR	OFF	2011/09/12 10:45
S45	1	cigarette and SCM	EPO; JPO; DERWENT	OR	OFF	2011/09/12 10:45
S46	3	tobacco and SCM	EPO; JPO; DERWENT	OR	OFF	2011/09/12 10:45
S47	68	"131".clas. and electric with cigarette and sensor	US-PGPUB; USPAT; USOCR	OR	OFF	2011/12/14 10:14
S48	1	"131".clas. and electric adj cigarette and sensor	US-PGPUB; USPAT; USOCR	OR	OFF	2011/12/16 14:06
S49	19	"131".clas. and atomizer and sensor	US-PGPUB; USPAT; USOCR	OR	OFF	2011/12/16 14:06
S50	18	"131".clas. and electronic adj cigarette and sensor	US-PGPUB; USPAT; USOCR	OR	OFF	2011/12/16 14:06
S51	3	"131".clas. and (electronic adj cigarette or atomizer) and sensor and detach $5	US-PGPUB; USPAT; USOCR	OR	ON	2011/12/16 14:25
S52	4	"131".clas. and (electronic adj cigarette or atomizer) and sensor and disconnect$3	US-PGPUB; USPAT; USOCR	OR	ON	2011/12/16 14:37
S53	18	"131".clas. and (electronic adj cigarette or atomizer or aerosol) and sensor and disconnect$3	US-PGPUB; USPAT; USOCR	OR	ON	2011/12/16 14:39
S54	10	"131".clas. and (electronic adj cigarette or atomizer or aerosol) and sensor and detach$5	US-PGPUB; USPAT; USOCR	OR	ON	2011/12/16 14:42
S55	10	"131".clas. and (electronic adj cigarette or atomizer or aerosol or vaporizor) and sensor and detach$5	US-PGPUB; USPAT; USOCR	OR	ON	2011/12/16 14:58

S56	0	"131".clas. and vaporizor	US-PGPUB; USPAT; USOCR	OR	ON	2011/12/16 14:58
S57	42	"131".clas. and vaporizer	US-PGPUB; USPAT; USOCR	OR	ON	2011/12/16 14:58
S58	1	"131".clas. and vaporizer and detach $5	US-PGPUB; USPAT; USOCR	OR	ON	2011/12/16 14:58

EAST Search History (Interference)

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12/ 18/ 2011 2:16:58 PM
C:\ Documents and Settings\ cszewczyk\ My Documents\ EAST\ Workspaces\ 12437511.wsp

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12437511	PAN, GUOCHENG
	Examiner	**Art Unit**
	CYNTHIA SZEWCZYK	1741

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	09/09/2011	12/18/2011							
	1	✓	✓							
	2	O	=							
	3	✓	=							
	4	✓	=							
	5	✓	=							
	6	O	=							
	7	✓	✓							
	8	✓	✓							
	9	✓	✓							
	10	✓	✓							
	11	✓	✓							
	12	✓	✓							
	13	✓	✓							
	14	✓	✓							

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12437511	PAN, GUOCHENG
	Examiner	**Art Unit**
	CYNTHIA SZEWCZYK	1741

SEARCHED

Class	Subclass	Date	Examiner
131	273	9/2011	CS

SEARCH NOTES

Search Notes	Date	Examiner
EAST search history	9/2011	CS
Inventor search in EAST and eDAN	9/2011	CS
Assignee search in PALM	9/2011	CS
Updated EAST search	12/2011	CS

INTERFERENCE SEARCH

Class	Subclass	Date	Examiner

Doc Code: M865 or FAI.REQ.INTV

PTOL-413A (10-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Applicant Initiated Interview Request Form

Application No.: 12/437,571 First Named Applicant: Guocheng Pan
Examiner: CYNTHIA SZEWCZYK Art Unit: 1741 Status of Application: Pending

Tentative Participants:
(1) Guocheng Pan (2) Norman Morales (reg. 55,463)
(3) _____ (4) _____

Proposed Date of Interview: 2/14/2012 Proposed Time: 11:00 EST (AM/PM)

Type of Interview Requested:
(1) [X] Telephonic (2) [ ] Personal (3) [ ] Video Conference

Exhibit To Be Shown or Demonstrated: [ ] YES [X] NO
If yes, provide brief description: _____

Issues To Be Discussed

Issues (Rej., Obj., etc)	Claims/ Fig. #s	Prior Art	Discussed	Agreed	Not Agreed
(1) REJ	1	COUNTS and SUSA	[ ]	[ ]	[ ]
(2) _____	_____	_____	[ ]	[ ]	[ ]
(3) _____	_____	_____	[ ]	[ ]	[ ]
(4) _____	_____	_____	[ ]	[ ]	[ ]

[ ] Continuation Sheet Attached
[X] Proposed Amendment or Arguments Attached
Brief Description of Arguments to be Presented: Proposed amendment w/RCE overcomes rejection under 102(b) and 103(a)

An interview was conducted on the above-identified application on _____.
NOTE: This form should be completed by applicant and submitted to the examiner in advance of the interview (see MPEP § 713.01).
This application will not be delayed from issue because of applicant's failure to submit a written record of this interview. Therefore, applicant is advised to file a statement of the substance of this interview (37 CFR 1.133(b)) as soon as possible.

_____ Applicant/Applicant's Representative Signature

_____ Examiner/SPE Signature

_____ Typed/Printed Name of Applicant or Representative

_____ Registration Number, if applicable

USSN 12/437,511

ATTACHMENT TO APPLICANT INITIATED INTERVIEW REQUEST FORM

PROPOSED AMENDMENT

1. (currently amended) An electronic cigarette comprising a tubular electronic inhaler and a tubular electronic atomizer that is detachably attached to the electronic inhaler, wherein the electronic inhaler includes an electric power source that provides an electric current to the electronic atomizer, and wherein the tubular electronic atomizer includes a container and a medium within the container, the medium is soaked with a solution to be atomized, and between the container and the medium there is a side-space for airflow ~~tubular electronic inhaler includes an electric airflow sensor that is used to turn on and off the electric power source by way of detecting an airflow~~.

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February 8, 2012

To:	Examiner Cynthia Szewczky	**Fax No:**	1.571.273.8300
Company:	U. S. Patent and Trademark Office	**Phone No:**	1.571.270.5130

From: Norman L. Morales **Number of Pages (including cover):** 3

Subject: Patent Application No. 12/437,511
Attorney Docket NO. 104372.00002

Dear Examiner Szewczyk:

Please see the attached.

Thank you,
Carolyn Winter for Norman Morales

Sender No: 09816 Account No: 104372.00002 Return to Office Carolyn Winter Job No

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/437,511	05/07/2009	Guocheng Pan	104372.00002	7646

44955 7590 02/16/2012

SQUIRE SANDERS (US) LLP
275 BATTERY STREET, SUITE 2600
SAN FRANCISCO, CA 94111-3356

EXAMINER	
SZEWCZYK, CYNTHIA	
ART UNIT	PAPER NUMBER
1741	
MAIL DATE	DELIVERY MODE
02/16/2012	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Applicant-Initiated Interview Summary	Application No.	Applicant(s)	
	12/437,511	PAN, GUOCHENG	
	Examiner	Art Unit	
	CYNTHIA SZEWCZYK	1741	

All participants (applicant, applicant's representative, PTO personnel):

(1) *CYNTHIA SZEWCZYK*. (3) *Guocheng Pan*.

(2) *Norman Morales*. (4)_____.

Date of Interview: *14 February 2012*.

Type: ☒ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☒ No.
If Yes, brief description: _____.

Issues Discussed ☐101 ☐112 ☒102 ☒103 ☐Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: *1*.

Identification of prior art discussed: *Counts and Susa*.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

Applicant presented proposed amendment with limitation regarding container and medium with solution to be atomized whaving a side space for air flow between the container and the medium. Examiner agrees that the proposed amendment appears to overcome Susa but would require further search and consideration. Examiner suggested replacing "medium" with "liquid storing media" to maintain consistency with terminology from the specification and figures.

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☒ Attachment

/Cynthia Szewczyk/ Examiner, Art Unit 1741	

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:
1) A brief description of the nature of any exhibit shown or any demonstration conducted,
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
   (The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

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Doc Code: M865 or FAI.REQ.INTV

PTOL-413A (10-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Applicant Initiated Interview Request Form

Application No.: 12/437,571 First Named Applicant: Guocheng Pan
Examiner: CYNTHIA SZEWCZYK Art Unit: 1741 Status of Application: Pending

Tentative Participants:
(1) Guocheng Pan (2) Norman Morales (reg. 55,463)
(3) _____ (4) _____

Proposed Date of Interview: 2/14/2012 Proposed Time: 11:00 EST (AM/PM)

Type of Interview Requested:
(1) [X] Telephonic (2) [ ] Personal (3) [ ] Video Conference

Exhibit To Be Shown or Demonstrated: [ ] YES [X] NO
If yes, provide brief description: _____

Issues To Be Discussed

Issues (Rej., Obj., etc)	Claims/ Fig. #s	Prior Art	Discussed	Agreed	Not Agreed
(1) REJ	1	COUNTS and SUSA	[ ]	[ ]	[ ]
(2)			[ ]	[ ]	[ ]
(3)			[ ]	[ ]	[ ]
(4)			[ ]	[ ]	[ ]

[ ] Continuation Sheet Attached
[X] Proposed Amendment or Arguments Attached
Brief Description of Arguments to be Presented: Proposed amendment w/RCE overcomes rejection under 102(b) and 103(a)

An interview was conducted on the above-identified application on _____.
NOTE: This form should be completed by applicant and submitted to the examiner in advance of the interview (see MPEP § 713.01).
This application will not be delayed from issue because of applicant's failure to submit a written record of this interview. Therefore, applicant is advised to file a statement of the substance of this interview (37 CFR 1.133(b)) as soon as possible.

Applicant/Applicant's Representative Signature
Examiner/SPE Signature
Typed/Printed Name of Applicant or Representative
Registration Number, if applicable

USSN 12/437,511

ATTACHMENT TO APPLICANT INITIATED INTERVIEW REQUEST FORM

PROPOSED AMENDMENT

1. (currently amended) An electronic cigarette comprising a tubular electronic inhaler and a tubular electronic atomizer that is detachably attached to the electronic inhaler, wherein the electronic inhaler includes an electric power source that provides an electric current to the electronic atomizer, and wherein the tubular electronic atomizer includes a container and a medium within the container, the medium is soaked with a solution to be atomized, and between the container and the medium there is a side-space for airflow ~~tubular electronic inhaler includes an electric airflow sensor that is used to turn on and off the electric power source by way of detecting an airflow~~.

PTO/SB/30 (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Request for Continued Examination (RCE) Transmittal

Address to:
Mail Stop RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Application Number	12/437,511
Filing Date	May 7, 2009
First Named Inventor	PAN
Art Unit	1741
Examiner Name	Cynthia Szewczyk
Attorney Docket Number	104372.00002

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. See Instruction Sheet for RCEs (not to be submitted to the USPTO) on page 2.

1. Submission required under 37 CFR 1.114 Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

   a. ☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

      i. ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____

      ii. ☐ Other _____

   b. ☒ Enclosed

      i. ☒ Amendment/Reply

      ii. ☐ Affidavit(s)/ Declaration(s)

      iii. ☒ Information Disclosure Statement (IDS)

      iv. ☐ Other _____

2. Miscellaneous

   a. ☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of _____ months. (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

   b. ☐ Other _____

3. Fees The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.

   a. ☒ The Director is hereby authorized to charge the following fees, any underpayment of fees, or credit any overpayments, to Deposit Account No. 07-1850.

      i. ☒ RCE fee required under 37 CFR 1.17(e)

      ii. ☐ Extension of time fee (37 CFR 1.136 and 1.17)

      iii. ☐ Other _____

   b. ☐ Check in the amount of $ _____ enclosed

   c. ☐ Payment by credit card (Form PTO-2038 enclosed)

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

Signature	[signature]	Date	March 2, 2012
Name (Print/Type)	NORMAN L. MORALES	Registration No.	55,463

CERTIFICATE OF MAILING OR TRANSMISSION

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop RCE, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450 or facsimile transmitted to the U.S. Patent and Trademark Office on the date shown below.

Signature			
Name (Print/Type)		Date	

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Mail Stop RCE, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	Examiner:
Guocheng Pan	Cynthia Szewczyk
Application No.: 12/437,511	Art Unit: 1741
Filed: May 7, 2009	Confirmation No.: 7646
Title: Electronic Cigarette	

Mail Stop **RCE**
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

AMENDMENT AFTER FINAL REJECTION SUBMITTED WITH RCE

Sir:

In response to the Office action mailed 12/22/2011, please amend the above-identified application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Amendments to the Specification begin on page 6 of this paper.

Amendments to the Drawings begin on page 7 of this paper.

Remarks/Arguments begin on page 8 of this paper.

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) An electronic cigarette comprising a tubular electronic inhaler and a tubular electronic atomizer that is detachably attached to the electronic inhaler, wherein the electronic inhaler includes an electric power source that provides an electric current to the electronic atomizer, and wherein the tubular electronic atomizer includes a container and media within the container, the media is soaked with a solution to be atomized, and between the container and the media there is a side-space for airflow ~~tubular electronic inhaler includes an electric airflow sensor that is used to turn on and off the electric power source by way of detecting an airflow~~.

2. (previously presented) An electronic cigarette comprising a tubular electronic inhaler and a tubular electronic atomizer, wherein the electronic inhaler includes an electric power source that provides an electric current to the electronic atomizer, the electronic cigarette further comprising an integrated circuit board that has a Single Chip Micyoco that controls atomization of a liquid solution.

3. (previously presented) An electronic cigarette comprising a tubular electronic inhaler and a tubular electronic atomizer, wherein the electronic inhaler includes an electric power source that provides an electric current to the electronic atomizer, the electronic cigarette further comprising an electric airflow sensor that is used to turn on and off the electric power source by way of detecting an airflow and sending a signal to a Single Chip Micyoco, wherein the Single Chip Micyoco receives the signal from the electric airflow sensor, instructs the electric power source to send an electric current to the electronic atomizer, and a time period and a magnitude of the electric current.

4. (previously presented) The electronic cigarette of claim 3, wherein the electric airflow sensor is a diaphragm microphone.

5. (original) The electronic cigarette of claim 3, further comprising an LED

indicator inside the electronic inhaler, wherein the LED indicator is connected to the Single Chip Micyoco and the electric power source, and wherein the on time of the LED indicator is controlled by the Single Chip Micyoco.

6. (previously presented) An electronic cigarette comprising a tubular electronic inhaler and a tubular electronic atomizer, wherein the electronic inhaler includes an electric power source that provides an electric current to the electronic atomizer, wherein the electronic inhaler includes, sequentially from a first end of the electronic inhaler to the second end, a cigarette cap, an LED indicator, the electric power source, an electric airflow sensor, a circuit board for a Single Chip Micyoco, and a first electric connector.

7. (original) The electronic cigarette of claim 1, wherein the electronic inhaler includes a first electric connector disposed at a second end of the electronic inhaler, wherein the electronic atomizer includes a second electric connector disposed at a first end of the electronic atomizer, and wherein the first electric connector is connected to the second electric connector so that the electronic inhaler and the electronic atomizer form the electronic cigarette.

8. (currently amended) The electronic cigarette of claim 1, ~~wherein the electronic atomizer includes a liquid container having a side space for airflow, wherein the liquid container includes a medium being soaked with a solution to be atomized, and~~ wherein the liquid container prevents or reduces liquid leak and reverse flow.

9. (currently amended) The electronic cigarette of claim 8, wherein the electronic atomizer includes an electric heating wire which generates heat for atomization of the solution soaked in the ~~medium~~ media inside the liquid container, a heat equalizer onto which the electric heating wire is wired and is made of ~~inorganic~~ fibers that can withstand a temperature up to 2000 degrees centigrade, wherein the heat equalizer ensures that the heat generated by the electric wire is uniform, and a supporting piece that is disposed next to the heat equalizer and is made of a plastic or ceramic material that can withstand a temperature up to 2000 degrees centigrade.

10. (previously presented) The electronic cigarette of claim 9, wherein the electronic atomizer includes a leak-proof member, wherein the leak-proof member and a

second electric connector are closer to the first end of the electronic atomizer than the heat equalizer.

11. (currently amended) The electronic cigarette of claim 1, wherein the electronic atomizer includes, in sequence, a second electric connector, a leak-proof piece, a supporting piece, a heat equalizer coupled with an electric heating wire, ~~a fluid~~ the container filled with the media ~~a medium~~, and an atomizer cap with an air-puffing hole.

12. (original) The electronic cigarette of claim 1, wherein the electric power source is inside the electronic inhaler.

13. (original) The electronic cigarette of claim 10, where the first electric connector is a DC socket and the second electric connector is a DC plug, wherein the DC plug is embedded onto the leak-proof piece through a plug seat, which is connected to the electric heating wire, and wherein the first end of the electronic atomizer is connected to the second of the electronic inhaler by placing the DC plug to the DC socket.

14. (original) The electronic cigarette of claim 13, wherein the first electric connector is a cylinder terminal, and its outskirt is tightly embedded into the second end of the electric inhaler tube and its exposed portion has a screw thread, wherein the second electric connector is a cylinder terminal, which is tightly embedded into the first end of the electronic atomizer and has a screw thread inside the inhaler tube, and wherein the fist electric connector and second electric connector are connected through the screw threads.

15. (new) The electronic cigarette of claim 1, wherein the tubular electronic inhaler includes an electric airflow sensor configured to turn on and off the electric power source by way of detecting an airflow, and the airflow sensor is a diaphragm microphone.

16. (new) The electronic cigarette of claim 1, wherein the tubular electronic atomizer includes an exterior wall having an air-puffing hole formed therethrough, wherein the liquid container includes a container wall, there being a chamber disposed between the exterior wall and the container wall, and wherein the tubular electronic atomizer includes a tube extending from the air-puffing hole and into the chamber.

17. (new) The electronic cigarette of claim 1, wherein the media comprises cotton.

18. (new) An electronic cigarette comprising:

a tubular electronic inhaler; and

a tubular electronic atomizer that is detachably attached to the electronic inhaler,

wherein the electronic inhaler includes an electric power source that provides an electric current to the electronic atomizer,

wherein the tubular electronic atomizer includes a container and media within the container, the media is soaked with a solution to be atomized,

wherein the tubular electronic atomizer includes an exterior wall having an air-puffing hole formed therethrough, wherein the liquid container includes a container wall, there being a chamber disposed between the exterior wall and the container wall, and

wherein the tubular electronic atomizer includes a tube extending from the air-puffing hole and into the chamber.

19. (new) The electronic cigarette of claim 18, wherein the tubular electronic atomizer includes, in sequence, an electric connector, a leak-proof piece, a supporting piece, a heat equalizer coupled with an electric heating wire, the container filled with the media, and the air-puffing hole.

20. (new) The electronic cigarette of claim 18, wherein the tubular electronic inhaler includes an electric airflow sensor configured to turn on and off the electric power source by way of detecting an airflow, and the airflow sensor is a diaphragm microphone.

AMENDMENTS TO THE SPECIFICATION

Please amend the second full paragraph at page 7 of the originally-filed application, as indicated below:

Figure 2 shows a section view of one integrated electronic atomizer of the present invention with the second electric connector being of the screw thread type. The electronic atomizer includes an atomizer tube 263 and, inside the atomizer tube 263, a second electric connector 267 with an internal screw thread with a rush pith 11 surrounded by a silica-gel insulator 18, supporting piece 268, heat equalizer 269 twined with electric heating wire 265, liquid container 261 inside which liquid-storing media 264 being filled with liquids is inserted, and an atomizer cap 262 with an air-puffing hole in the center. Between the liquid container 261 and the liquid media 264 there preferably is a side-space 290 (FIG. 3) for airflow. The second electric connector 267 may be inserted inside the atomizer tube 264.

Please add the following new paragraph at the end of page 10 of the originally-filed application, as indicated below:

Referring to FIGS. 2 and 3, the tubular electronic atomizer includes exterior wall 300 having air-puffing hole 302 formed therethrough. Liquid container 261 includes a container wall 304. Chamber 306 is disposed between exterior wall 300 and container wall 304. Tube 308 extends from air-puffing hole 302 and into chamber 306.

AMENDMENTS TO THE DRAWINGS

Submitted herewith are two (2) drawing replacement sheets showing FIGS. 2 and 3, which are to replace the prior-filed sheets for FIGS. 2 and 3. All other sheets of drawings are to be maintained in the application without change.

FIGS. 2 and 3 have been amended to include leader lines and reference numerals 290, 300, 302, 304, 306 and 308. The addition of the reference numerals is consistent with the amendments to the specification indicated above. No new matter is introduced.

REMARKS/ARGUMENTS

Reconsideration and withdrawal of the rejections are respectfully requested. A Request for Continued Examination (RCE) is being filed concurrently herewith.

Status of Claims

Claims 2-6 stand allowed.

Claims 1, 8, 9 and 11 are currently amended.

Claims 15-20 are new.

No new matter is introduced by this amendment. Support for the amendments can be found throughout the application as originally filed. Although limitations from the written description are not to be read into the claims, support can be found for example in the following parts of application as originally filed.

Claims	PG Pub. 2010/0242974
1	paragraph 27
15, 20	original claim 4
16, 18	figures 2 and 3
17	paragraph 28

Summary of Applicant-Initiated Examiner Interview

A telephonic interview was held on February 14, 2012, with participants being Examiner Cynthia Szewczyk, Applicant Goucheg Pan, and the undersigned attorney.

A proposed amendment to claim 1 was submitted via facsimile to Examiner Cynthia Szewczyk on February 8, 2012. The undersigned asserted that the proposed amendment to claim 1 overcomes a rejection over Counts and Susa because the structure "between the container and the media there is a side-space for airflow" was absent from Counts and Susa. Examiner Szewczyk agreed.

In the Specification and Drawings

The specification is amended as indicated above. Reference numeral 290 is added to the paragraph at page 7 and FIG. 3 to indicate an exemplary side-space. A new paragraph

was added to page 10 to correspond to new claims 16 and 18, support for which is found in FIGS. 2 and 3 as originally filed.

Rejection under 35 U.S.C. §102

Claims 1, 7, 12 were rejected under 35 U.S.C. §102(b) as being anticipated by US 5,060,671 ("Counts"). For the following reasons, Applicant respectfully requests reconsideration and withdrawal of the rejection with respect to the amended claims.

Claim 1 is currently amended to recite, in part: "the tubular electronic atomizer includes a container and media within the container, the media is soaked with a solution to be atomized, and between the container and the media there is a side-space for airflow." Counts fails to teach at least these features of claim 1. The Office acknowledges that Counts "is silent to the heater having container for the flavor generating medium" (Office Action p. 3).

Accordingly, Applicant respectfully submits that claims 1 and the claims depending therefrom (claims 7 and 12) are patentably allowable over Counts.

Rejection under 35 U.S.C. §103(a)

Claims 8-11, 13 and 14 were rejected under 35 U.S.C. §103(a) as being unpatentable over Counts in view of EP 0845200 A1 ("Susa").

Claim 1

As indicated above, claim 1 is patentably allowable over Counts. As discussed during the examiner interview (summarized above), Susa fails to cure the deficiencies of Counts with respect to claim 1, so claim 1 and the claims depending therefrom (claims 8-11, 13 and 14) are patentably allowable over Counts in view of Susa.

As mentioned above, the Office acknowledges that Counts "is silent to the heater having container for the flavor generating medium" (Office Action p. 3). The Office Action asserts that Susa teaches "a liquid container (32) having a side-space for airflow (see figure 1), wherein the liquid container includes a medium being soaked with a solution to be atomized (col. 5, lines 51-58), and that it would have been obvious to one of ordinary skill in the art that "the atomizer arrangement in Susa could have been substituted into the atomizer of Counts because the arrangement of Susa would be able to contain a greater amount of flavor generating medium and would last longer than the current arrangement of Counts"

(Office Action pp. 3-4). Applicant respectfully disagrees with the Office's conclusion of obviousness.

Applicant notes that "[i]f the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious" (MPEP §2143.1). Counts operates by using a flavor generating medium that need not be in a liquid container. According to Counts, the flavor generating medium can be "unburned tobacco or composition containing unburned tobacco" (col. 3, lines 2-3) and "would be deposited as a coating, in conjunction with adhesion agents such as citrus pectin, on a heater or on an inert substrate in contact with a heater" (col. 3, lines 16-20). Susa operates under a completely different principle of operation. In Susa, the flavor generating medium is not in the form of a coating. In Susa, liquid material is transported out of container (32) to a ceramic heater (42) located outside of container (32) (see col. 7, line 16). Therefore, contrary to the Office's assertion, it would not have been predictable for a person of ordinary skill in the art to substitute the arrangement of Susa for the atomizer of Counts since doing so would change the principle of operation of Counts.

Furthermore, Applicant respectfully submits that there is no support for the Office's rationale for substituting the arrangement of Susa into the arrangement of Counts, i.e., "to contain a greater amount of flavor generating medium and would last longer" (Office Action pp. 3-4). For this additional reason, it would have been it would not have been predictable to make the Office's proposed substitution.

Even if the Office's proposed substitution was made, the results of the substitution would still fail to meet the features of claim 1 as amended. Counts and Susa, individually and even if combined, fail to teach "between the container and the medium there is a side-space for airflow," as recited in claim 1. There is no teaching in Susa of a side-space for airflow between container (32) and liquid material (36) within container (32). In Susa, airflow occurs outside of container (32).

Accordingly, claim 1 is patentably allowable over Counts in view of Susa.

Claim 11

Even if the Office's proposed substitution was made, the results of the substitution would still fail to meet the features of claim 11, which recites: "the electronic atomizer includes, in sequence, a second electric connector, a leak-proof piece, a supporting piece, a

heat equalizer coupled with an electric heating wire, a fluid container filled with a medium, and an atomizer cap with an air-puffing hole." In Susa, the structural sequence is: connecting portion (13), liquid container (32), ceramic heater (42), and suction port (22). See Susa FIG. 1. The liquid container (32) and ceramic heater (42) have the reverse sequence of the electric heating wire and fluid container of claim 11. Modifying the arrangement in Susa by reversing the sequential positions of the container (32) and ceramic heater (42) would have been unpredictable since doing so would be contrary to the airflow dictated by the location of air intake ports (24) and suction port (22).

Accordingly, claim 11 is patentably allowable over Counts in view of Susa.

New Claims

New claims 15-17 depend from claim 1, include all the features of claim 1, and are thereby patentably allowable over Counts in view of Susa for at least the same reasons given above for claim 1.

New claim 18 recites, in part: "wherein the tubular electronic atomizer includes an exterior wall having an air-puffing hole formed therethrough, wherein the liquid container includes a container wall, there being a chamber disposed between the exterior wall and the container wall, and wherein the tubular electronic atomizer includes a tube extending from the air-puffing hole and into the chamber." These features inhibit flow of liquid to the user's mouth. Susa and Counts, individually and combined, fail to teach these features of clam 18. Therefore, claim 18 and claims 19-20 depending therefrom are patentably allowable over Counts in view of Susa.

CONCLUSION

In light of the foregoing remarks, this application is considered to be in condition for allowance, and early passage of this case to issue is respectfully requested. Please charge any deficiency in fees or credit any overpayments to Deposit Account No. 07-1850.

Respectfully submitted,

Date: March 2, 2012

/Norman Morales/

Norman L. Morales
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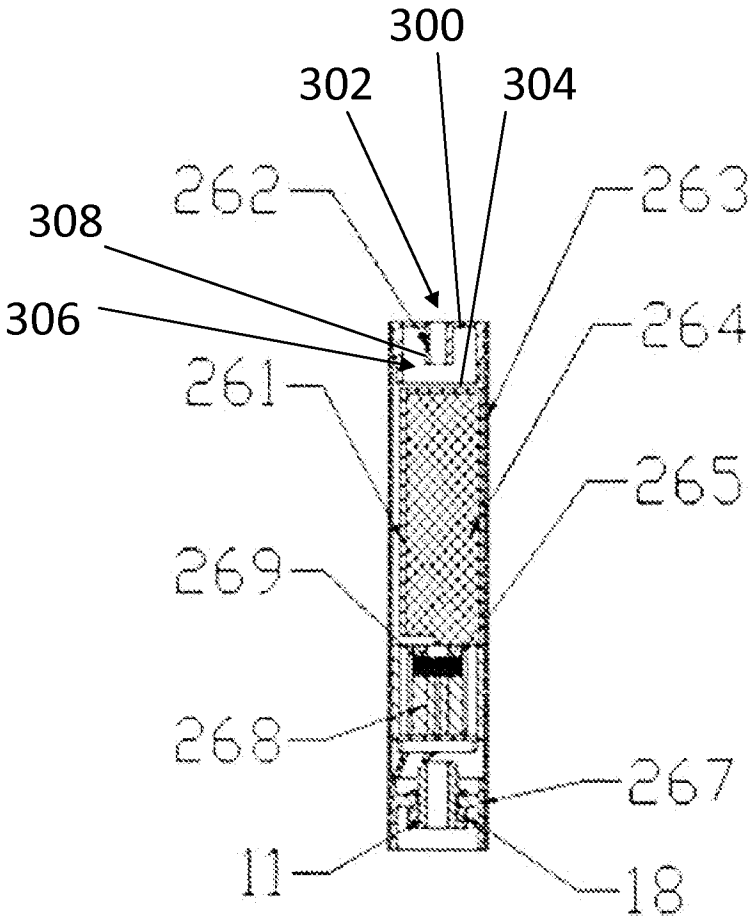

Figure 2

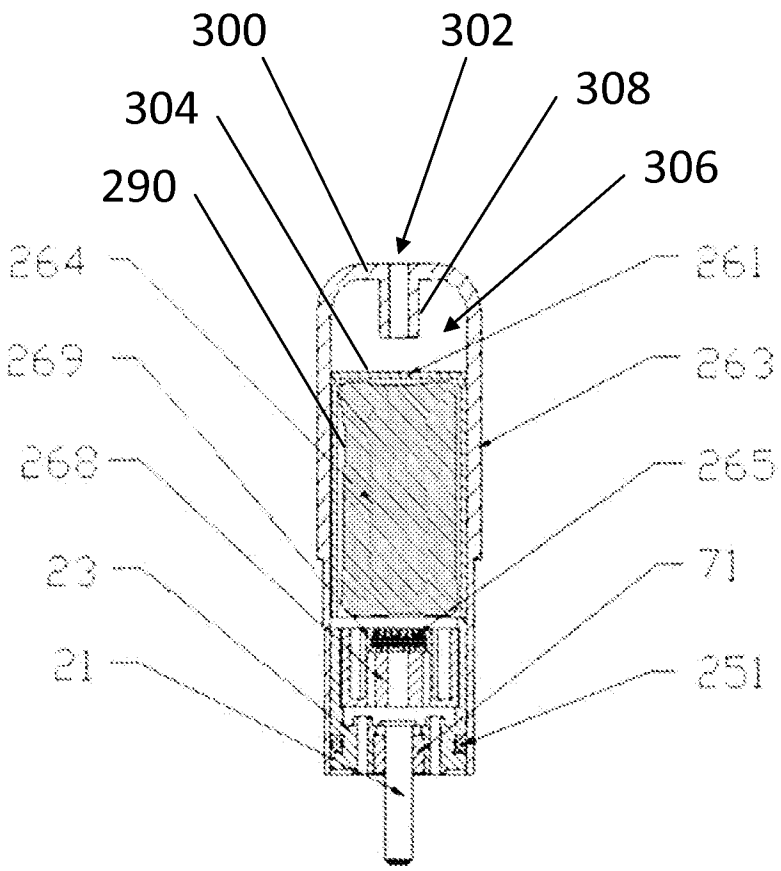

Figure 3

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:		Examiner:	
	Guocheng Pan		Cynthia Szewczyk
Serial No.	12/437,511	Art Unit:	1741
Filed:	May 7, 2009	Confirm. No.	7646
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Commissioner for Patents
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INFORMATION DISCLOSURE STATEMENT PURSUANT TO 37 C.F.R. §§1.97-1.98

In accordance with the duty of disclosure under 37 C.F.R. §1.56 and pursuant to 37 C.F.R. §§1.97-1.98, Applicants hereby notify the U.S. Patent and Trademark Office of the reference(s) listed on the attached Form PTO-1449.

The references listed on the attached Form PTO-1449 were cited in a counterpart foreign application.

The submission of the listed documents is not intended as an admission that any such document constitutes prior art against the claims of the present application. Applicants reserve the right to dispute the listed documents as prior art during examination. Furthermore, Applicants do not waive any right to take any action that would be appropriate to antedate or otherwise remove any listed document as a competent reference against the claims of the present application. The submission of this Information Disclosure Statement is not to be construed as a representation that a search has been made or that no other material information may exist.

The Examiner is requested to initial the enclosed Forms PTO-1449 and return a copy thereof to the undersigned.

The present Information Disclosure Statement is being submitted concurrently with a Request for Continued Examination (RCE) and RCE fee payment. The Commissioner is authorized to charge any deficiencies in fee payment and to credit any overpayments to Deposit Account No. **07-1850**.

Respectfully submitted,

Date: March 2, 2012

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FORM PTO-1449 (MODIFIED) US DEPARTMENT OF COMMERCE
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INFORMATION DISCLOSURE CITATION in an Application

(Use several sheets if necessary)

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U.S. PATENT DOCUMENTS

Examiner Initial	Ref. No.	Document Number	Date of Patent	Name	Class	Subclass	Filing Date if Appropriate
	A1						
	A2						
	A3						

U.S. PATENT APPLICATION PUBLICATION DOCUMENTS

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	A4						
	A5						

FOREIGN PATENT DOCUMENTS

Examiner Initial	Ref. No.	Document Number	Date of Publication	Country	Class	Subclass	Translation Abstract Yes	Translation Abstract No
	B1	EP 0845220 A1	6/3/98	Europe			X	
	B2	WO 2009/152651 A1	12/23/09	WIPO			X	
	B3	CN 201379073 Y	1/13/10	China			X	
	B4	CN 201238610 Y	5/20/09	China			X	
	B5	CN 201067728 Y	6/4/08	China			X	

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, etc.)

	C1	UK Intellectual Property Office, "Combined Search and Examination Report" for Application No. GB0913768.8, report dated April 8, 2010 (5 pages)

EXAMINER	DATE CONSIDERED

EXAMINER: Initial if references considered, whether or not citation is in conformance with MPEP § 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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(54) FLAVOR PRODUCING ARTICLE

(57) A flavor generation article (10) has a casing (12) constituted by first and second portions (12a, 12b) that are detachably connected to each other. A gas flow path (26) is formed in the casing first portion (12a) to extend from an air intake port (24) to reach a suction port (22). The first portion (12a) incorporates a material container (32) of a liquid material (36) containing a flavor substance. A discharge port (35) of the material container (32) is arranged in the gas flow path (26), and a ceramic heater (42) is disposed to oppose it. The liquid material (36) is supplied from the discharge port (35) onto the ceramic heater (42) and is heated, so that it is gasified in the gas flow path (26). The casing second portion (12b) incorporates a control circuit (72) and a power supply (62).

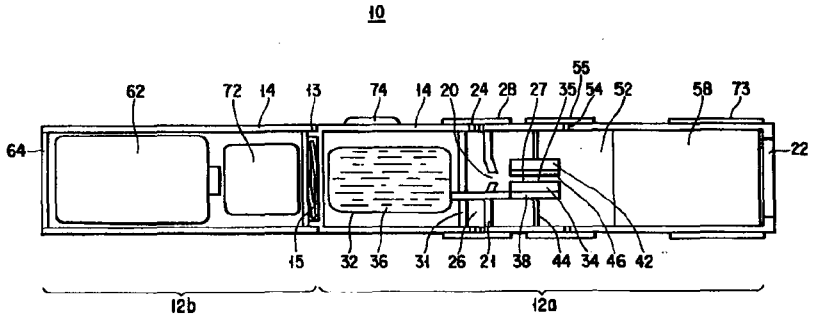

FIG. 1

EP 0 845 220 A1

Description

Technical Field

The present invention relates to a flavor generation article employed for enjoying inhalation of a flavor and simulated smoking and, more particularly, to a flavor generation article used for generating the flavor as an inhalation target by heating a liquid material with an electric heater.

Background Art

A simulated smoking article employed for enjoying the flavor and smoke of tobacco without burning tobacco is already known, and various types of simulated smoking articles have been proposed.

Jpn. Pat. Appln. KOKAI Publication No. 3-232481 discloses a typical concept of a conventional simulated smoking article. The article of this reference uses, e.g., a rod-like solid material. When the solid material is heated by a heating element, an inhalation target, e.g., a flavor, is generated. The drawbacks of the article of this type are as follows. When the solid material is continuously heated, the material is largely wasted. Inversely, when the solid material is heated in accordance with inhalation of the user, a large time lag occurs between the start of inhalation (one puffing operation) of the user and generation of the flavor.

As an example of an article that copes with the above drawbacks, Jpn. Pat. Appln. KOKAI Publication No. 3-277265 discloses a flavor emitting article having a solid material divided into a large number of portions. In the article of this reference, the respective portions of the solid material are sequentially heated in units of puffing operations of the user to generate an inhalation target, e.g., a flavor or the like. The drawback of this article is that the solid material and a heating element constitute an integral flavor generation medium. Therefore, when the material is consumed, the heating element must be exchanged or disposed of together with the material, which is not preferable both in terms of economy and environment.

Jpn. Pat. Appln. KOKAI Publication No. 5-212100 discloses an example of a mechanism that detects one puffing operation of the user. In the article of this reference, the driving operation of a heating element for heating the flavor material is controlled by a signal obtained from the motion of the lips of the user.

U.S.P. No. 4,945,931 discloses a simulated smoking article using a pressurized aerosol container. In the article of this reference, the puffing operation of the user swings the vanes to mechanically open the outlet port of the container, and the aerosol is emitted. As a modification, this reference also discloses an article in which a heating element for heating aerosol cooled by the heat of evaporation is disposed in the outlet port of the container. The drawback of this reference is as follows. Since the pressurized aerosol is closed in the container with a valve which is opened/closed merely by the puffing operation of the user, once the valve is opened, a large amount of aerosol leaks undesirably. More specifically, in the article of this reference, a predetermined amount of aerosol appropriate for one puffing operation cannot be continuously emitted, and rather all of the pressurized flavor gas may undesirably be emitted until a puffing operation is complete twice or three times.

Disclosure of Invention

The present invention has been made in view of the above problems, and has as its object to provide a flavor generation article in which waste of a flavor material does not occur easily and the timing of one puffing operation of the user and that of generation of a flavor can be matched easily.

According to the first aspect of the present invention, there is provided a flavor generation article characterized by comprising:

a casing having an air intake port for taking in air therein and a suction port through which a user inhales a flavor, and forming a gas flow path between the intake port and the suction port;
a material container for storing a liquid material which contains at least a flavor substance and having a discharge port for the material, the material container being mounted on the casing;
discharge driving means for discharging the material from the container through the discharge port in the form of a liquid drop;
gasifying means disposed in the gas flow path to receive the liquid drop of the material discharged from the container and gasify the material by electrically heating the liquid drop; and
a power supply for supplying electric energy to the gasifying means.

According to the second aspect of the present invention, there is provided a flavor generation article in the first aspect, characterized by further comprising a sensor for detecting an inhaling operation of the user and control means for controlling, based on a signal from the sensor, the discharge driving means so as to discharge the material from the container.

According to the third aspect of the present invention, there is provided a flavor generation article in the second aspect, characterized in that the sensor comprises a pressure-sensitive sensor mounted on the casing around the suction port.

According to the fourth aspect of the present invention, there is provided a flavor generation article in the second or third aspect, characterized in that the control means controls the gasifying means based on the signal from the sensor so that the gasifying means generates heat.

According to the fifth aspect of the present invention, there is provided a flavor generation article in the fourth aspect, characterized in that the control means controls the gasifying means and the discharge driving means so as to preheat the gasifying means prior to discharge of the material.

According to the sixth aspect of the present invention, there is provided a flavor generation article in the first aspect, characterized in that the power supply is disposed in the casing.

According to the seventh aspect of the present invention, there is provided a flavor generation article in the sixth aspect, characterized in that the casing is constituted by first and second portions that are electrically connected to each other through a cable, the gas flow path, the container, the discharge driving means, and the gasifying means being disposed in the first portion, and the power supply being disposed in the second portion.

According to the eighth aspect of the present invention, there is provided a flavor generation article in the seventh aspect, characterized in that the first and second portions of the casing are detachably connected to each other through a connecting portion.

According to the ninth aspect of the present invention, there is provided a flavor generation article in the first aspect, characterized by further comprising an operation lever for manually operating the discharge driving means.

According to the 10th aspect of the present invention, there is provided a flavor generation article in any one of first to ninth aspects, characterized in that the gasifying means comprises a porous layer, and the liquid drop of the material is supplied onto the porous layer.

According to the 11th aspect of the present invention, there is provided a flavor generation article in any one of the first to 10th aspects, characterized in that the gasifying means is arranged to oppose the discharge port, and a throttle hole for directing air flowing from the air intake port toward a gap between the discharge port and the gasifying means is disposed in the gas flow path.

According to the 12th aspect of the present invention, there is provided a flavor generation article in any one of first to 11th aspects, characterized in that the casing is formed with an outer air inlet hole to supply an outer air into the gas flow path between the gasifying means and the suction port.

According to the 13th aspect of the present invention, there is provided a flavor generation article in any one of first to 12th aspects, characterized by further comprising a formed body of a solid material containing at least a flavor substance and disposed in the gas flow path so as to be located between the gasifying means and the suction port.

According to the 14th aspect of the present invention, there is provided a flavor generation article in the 13th aspect, characterized by further comprising heating means for heating the formed body.

According to the present invention, a flavor generation article can be provided in which waste of a flavor material does not occur easily and the timing of one puffing operation of the user and that of generation of a flavor can be matched easily. In particular, when the discharge driving means is controlled based on a signal from a sensor that detects the inhaling operation of the user, not only waste of the material is eliminated, but also a stable flavor can constantly be provided. When the casing is divided into a portion incorporating a power supply and a portion to be held by the mouth such that the two portions are detachable from each other, the flavor generation article can be used more conveniently.

Brief Description of Drawings

FIG. 1 is a schematic view showing a flavor generation article according to an embodiment of the present invention;

FIG. 2 is a plan view showing the discharge head of the flavor generation article shown in FIG. 1;

FIG. 3 is an enlarged schematic view showing the discharge head and discharge drive portion taken along the line III - III of FIG. 2;

FIG. 4 is a diagram showing the control system of the flavor generation article shown in FIG. 1;

FIG. 5 is a view showing the state of use of the flavor generation article shown in FIG. 1;

FIG. 6 is a graph showing an example of operation timing of energization of the ceramic heater and that of actuation of the discharge drive portion, of the flavor generation article shown in FIG. 1;

FIG. 7 is a graph showing another example of operation timing of energization of the ceramic heater and that of actuation of the discharge drive portion, of the flavor generation article shown in FIG. 1;

FIG. 8 is a schematic view showing a flavor generation article according to another embodiment of the present invention;

FIG. 9 is a schematic view showing a flavor generation article according to still another embodiment of the present invention,.

FIG. 10 is a schematic view showing a flavor generation article according to still another embodiment of the present invention;

FIG. 11 is a schematic view showing a flavor generation article according to still another embodiment of the present invention;

FIG. 12 is a schematic view showing a flavor generation article according to still another embodiment of the present invention;

FIG. 13 is a schematic view showing a flavor generation article according to still another embodiment of the present invention;

FIG. 14 is a schematic view showing a flavor gener-

ation article according to still another embodiment of the present invention;

FIG. 15 is a schematic view showing a flavor generation article according to still another embodiment of the present invention; and

FIG. 16 is a schematic view showing a flavor generation article according to still another embodiment of the present invention.

Best Mode of Carrying Out the Invention

FIG. 1 is a schematic view showing a flavor generation article according to an embodiment of the present invention.

A flavor generation article 10 has a cylindrical casing 12 having such an outer diameter that the user can hold the casing 12 in his mouth. The casing 12 comprises a first portion 12a to be held by the user's mouth, and a second portion 12b for incorporating a power supply and the like. The two portions 12a and 12b are detachably connected to each other through a connecting portion 13 formed on a casing main body 14. The two portions 12a and 12b are electrically connected to each other through a cable 15 stored in a space formed in the casing main body 14 to correspond to the connecting portion 13. As the connecting portion 13, a known structure, e.g., a screw or a fitting pair, can be employed. The main body 14 of the casing 12 is made of a material, e.g., a plastic, metallic, ceramic, or wooden material.

A suction port 22 through which the user inhales the flavor is formed in the end portion of the first portion 12a of the casing 12. In contrast to this, a plurality of air intake ports 24 for taking in air into the casing 12 are formed in the intermediate portion of the first portion 12a. A gas flow path 26 is defined in the casing 12 between the air intake ports 24 and the suction port 22. The air intake ports 24 can be formed to have an open area corresponding to a predetermined air intake amount. As shown in FIG. 1, an adjusting ring 28 having a plurality of openings can be disposed on the casing 12 around the air intake ports 24. In this case, the amount of air flowing into the casing 12 can be adjusted by adjusting the position of the adjusting ring 28 with respect to the air intake ports 24.

A throttle plate 21 having a throttle hole 20 at its center is disposed in the casing 12 to be located in the gas flow path 26. The throttle hole 20 serves to regulate air from the air intake ports 24 to flow along the surface of a ceramic heater 42 (to be described later).

A material container 32 for storing a liquid material 36 for generating a flavor or the like to be inhaled by the user is detachably fixed in a space which is deep in the first portion 12a of the case and partitioned from the gas flow path 26 by a wall 31. The material container 32 stores the liquid material 36 in an amount corresponding to the discharge amount of a plurality of puffing operations of the user.

The material container 32 can be mounted on the outer side of the casing main body 14. In this case, the head portion of the material container 32 may be inserted in the casing main body 14, or only discharge ports 35 (to be described later) may be inserted in the casing main body 14.

The liquid material 36 contains at least a flavor substance. For example, if the liquid material 36 is an article used for enjoying only the flavor, e.g., menthol or caffeine, it can be a material that generates only the flavor. Also, in order to add smoke to the flavor, the liquid material 36 can contain a material which generates aerosol when heated. As the material that generates aerosol, alcohols, saccharide, or water, or a mixture of at least two of these components can be used. The alcohols used in this case are, e.g., glycerin or propylene glycol, or their mixture.

More specifically, the liquid material 36 can contain an extracted material and/or the constituent components of various types of natural materials in accordance with the application purpose. For example, if this article is used as a simulated smoking article, a tobacco component, e.g., a tobacco extracted component or a tobacco smoke condensate component, may be contained in the liquid material 36.

The material container 32 is formed with a discharge head 34 having the plurality of discharge ports 35 for discharging the liquid material 36 in a transverse direction of the casing 12. The discharge head 34 is arranged to be located closer to the suction port 22 than the throttle hole 20. A discharge drive portion 38 is disposed adjacent to the discharge ports 35 to discharge the liquid material 36 from the material container 32 through the discharge ports 35. The discharge head 34 and the discharge drive portion 38 comprise a liquid discharge mechanism (having the same principle as that of the method shown in Jpn. Pat. Appln. KOKOKU Publication No. 53-45698 and U.S.P. No. 3,596,275) utilizing a piezoelectric element.

For example, as shown in FIG. 2, 10 discharge ports 35 are arranged for two rows, leading to a total of 20 discharge ports 35 in a region with a width W of about 2 mm and a length L of about 5 mm of the upper surface of the discharge head 34. The center of arrangement of the discharge ports 35 almost coincides with the center of the ceramic heater 42 (to be described later).

FIG. 3 is an enlarged schematic view showing the discharge head 34 and discharge drive portion 38 taken along the line III - III of FIG. 2. More specifically, FIG. 3 shows a section corresponding to one row of the discharge ports 35. A section corresponding to the other row of the discharge ports 35 and the section shown in FIG. 3 are horizontally symmetrical.

As shown in FIG. 3, a frame 134 constituted by a plurality of components is stacked on a wiring board 132 to form recessed portions and holes to be filled with the liquid material 36. The recessed portions formed by the

frame 134, excluding the plurality of discharge ports 35, are covered with a film 136. A liquid reservoir 146 is formed under the discharge ports 35 to temporarily store the liquid material 36. The bottom plate of the liquid reservoir 146 is constituted by an electrode 138 that serves as a vibration plate.

The liquid material 36 from the material container 32 is supplied first through a narrow flow path 142, and flows from a plurality of suction holes 144, having a smaller diameter than that of the discharge ports 35, to reach the liquid reservoir 146. Under the control of a control circuit 72, when the electrode 138 is operated to vibrate, the liquid material 36 is selectively discharged through the discharge ports 35 having a low resistance against the flow. The discharged liquid material 36 is supplied onto the ceramic heater 42 as a liquid drop LD.

Other than this, as the discharge mechanism of the liquid material 36, a known printer ink discharge mechanism can be modified and employed, e.g., a method disclosed in Jpn. Pat. Appln. KOKOKU Publication No. 61-59911 and the like wherein the process liquid is injected by bubbles generated by heating it, or a method disclosed in U.S.P. No. 3,060,429 and the like wherein the particles of the process liquid are electrified to perform electric field control. Alternatively, a discharge mechanism in which a liquid material 36 is a pressurized liquid and is controlled by opening/closing a valve disposed in a discharge ports 35 may be employed.

The ceramic heater 42 is disposed in the gas flow path 26 to oppose the discharge ports 35. The ceramic heater 42 is fixed on the inner surface of the casing main body 14 through a support member 44. A gap 27 between the discharge ports 35 of the discharge head 34 and the ceramic heater 42 is set such that air from the throttle hole 20 can flow through it. Accordingly, air from the air intake ports 24 is directed by the throttle hole 20 to the gap 27 between the discharge ports 35 and ceramic heater 42.

A material corresponding to one puffing operation, which is driven by the discharge drive portion 38 and emitted from the discharge ports 35 is supplied onto the ceramic heater 42 in the form of a liquid splash or liquid drop. The ceramic heater 42 is constituted by a ceramic plate and a coated resistance heater on the ceramic plate, and is accordingly an integral member of a catch pan for receiving the splash of the material and a heating means for heating the catch pan. However, the catch pan and the heating means can be disposed as separate components.

A liquid-absorbing porous layer 46 having a thickness of 0.01 mm to 2.0 mm, e.g., an activated carbon layer having a thickness of about 0.5 mm, is formed on a surface of the ceramic heater 42 that receives the liquid splash of the material, i.e., a surface of the ceramic heater 42 that serves as the catch pan. The porous layer 46 not only protects the surface of the ceramic heater 42 but also relaxes heat conduction from the ceramic heater 42, thereby stabilizing gasification of the splash of the material. The porous layer 46 can be formed of an organic compound, e.g., natural cellulose, a cellulose derivative, or an aramid resin, or an inorganic compound, e.g., carbon (including activated carbon), alumina, or silicon carbide. The porous layer 46 can have an arbitrary shape. For example, the compound mentioned above may be formed as a formed body in advance, e.g., a film, a sheet, a plate, fabric, or unwoven fabric, and be used as the porous layer 46. Alternatively, the porous layer 46 may be formed by directly applying the powder of the component mentioned above on the ceramic heater 42.

A cooling chamber 52 is formed between the ceramic heater 42 and the suction port 22 to constitute part of the gas flow path 26. Outer air inlet holes 54 are formed in the side wall of the casing main body 14 defining the cooling chamber. The gas heated by the ceramic heater 42 and containing a flavor is mixed with the outer air and cooled in the cooling chamber 52, and reaches the suction port 22. The outer air inlet holes 54 can be formed to have an open area corresponding to a predetermined air inlet amount. As shown in FIG. 1, an adjusting ring 55 having a plurality of openings can be disposed on the casing 12 around the outer air inlet holes 54. In this case, the amount of outer air flowing into the cooling chamber 52 can be adjusted by adjusting the position of the adjusting ring 55 with respect to the outer air inlet holes 54.

A filter 58 is disposed in the gas flow path 26 between the cooling chamber 52 and suction port 22 to cover the suction port 22. When the filter 58 is disposed, the pressure loss can be adjusted so that the flavor component can be inhaled with an appropriate pressure. The filter 58 can be made of a normal tobacco filter material made of cellulose acetate, pulp, or the like.

A power supply 62 is detachably fixed in the second portion 12b of the casing 12. The power supply 62 is used to supply electric energy to the discharge drive portion 38, the ceramic heater 42, and the control circuit 72 (to be described later). The power supply 62 can be mounted in and removed from the casing main body 14 by opening/closing a cap 64 that closes the rear opening of the casing main body 14. The power supply 62 is preferably a DC power supply, e.g., a commercially available dry cell or rechargeable cell. However, the power supply 62 can be an AC power supply. The power supply 62 can be mounted on the outer side of the casing main body 14, or can be provided separately and connected to the casing main body 14 with a wire.

The control circuit 72 for controlling the driving operation of the discharge drive portion 38 and the ceramic heater 42 is arranged between the power supply 62 and material container 32. As shown in FIG. 4, the control circuit 72 has a signal processing circuit 72a, a drive circuit 72b, and a power circuit 72c. The signal processing circuit 72a is connected to a sensor 73 for detecting the inhaling operation of the user and a manual ON/OFF switch 74. The drive circuit 72b is con-

nected to the discharge drive portion 38 and the ceramic heater 42. The power circuit 72c is connected to the power supply 62.

The sensor 73 for detecting the inhaling operation of the user is disposed around the casing main body 14 to be adjacent to the suction port 22. The sensor 73 has the same principle as that of a general strain type pressure-sensitive sensor for detecting a change in resistance or capacitance, a piezoelectric electromotive force, or the like, and generates an electrical signal upon detection of a pressure with which the user holds the casing 12 in his mouth. Alternatively, as the sensor 73, a swing vane type sensor (to be described later), a contact type sensor, a lip sensor disclosed in Jpn. Pat. Appln. KOKAI Publication No. 5-212100, or the like can be used.

Upon reception of a signal from the manual ON/OFF switch 74, or based on a signal from the sensor 73, the control circuit 72 starts the discharge drive portion 38 and the ceramic heater 42 at a timing to match the inhaling operation of the user, so that the liquid material is discharged and gasified. For example, signal processing of the control circuit 72 and the way of control of the control circuit 72 can be known as analog control or two-position control, or their combination.

The manual ON/OFF switch 74 is disposed on the side surface of the first portion 12a of the casing 12. When this article is not in use, the switch 74 may be manually switched to the OFF state, thereby forcibly stopping the discharge drive portion 38 and the heater 42. The manual switch 74 has the same mechanism as that of a general compact push switch, e.g., a micro limit switch having an electric contact.

When this article is in use, i.e., while the switch 74 is set in the ON state, the heater 42 may be kept heated. In this case, the control circuit 72 need only control the operation of the discharge drive portion 38 that controls discharge of the liquid material.

How the flavor generation article 10 shown in FIG. 1 is operated will be described.

When the user performs simulated smoking or inhales the flavor by using the flavor generation article 10 shown in FIG. 1, first, the user turns on the manual switch 74, holds the first portion 12a of the casing 12 with his mouth, and performs an inhaling operation through the suction port 22. By this operation, the sensor 73 outputs an inhaling operation signal to the control circuit 72. Accordingly energization of the ceramic heater 42 is started under the control of the control circuit 72. Simultaneously, or with a lapse of a predetermined period after the start of energization, the discharge drive portion 38 is actuated.

The liquid material 36 is then discharged from the discharge ports 35 and gasified as it is heated by the ceramic heater 42. As the user performs an inhaling operation, the gasified material is mixed with main suction air which has been taken in from the air intake ports 24, passed through the throttle hole 20, and guided to a portion between the discharge ports 35 and ceramic heater 42, and is guided to the suction port 22.

Energization of the ceramic heater 42 and actuation of the discharge drive portion 38 are performed, e.g., at the operation timings shown in FIG. 6 or 7. FIG. 6 shows a case wherein, in response to a signal from the sensor 73, the ceramic heater 42 is energized and heated and the liquid material 36 is discharged simultaneously. FIG. 7 shows a case wherein, in response to a signal from the sensor 73, the ceramic heater 42 is energized and preheated in advance, and with a lapse of a predetermined period of time, i.e., when the heater temperature has increased to a certain degree, the liquid material 36 is discharged.

If necessary, the amount of main suction air taken in from the air intake ports 24 and the amount of inlet air supplied from the outer air inlet holes 54 can be changed by adjusting the adjusting rings 28 and 60 during inhalation. Then, the taste of air containing the flavor and reaching the suction port 22 can be changed, so that the user can perform simulated smoking or inhalation of the flavor in accordance with the taste of his inhalation feeling.

As described above, the casing 12 has a structure in which the first portion 12a storing the liquid material 36, the discharge head 34, the ceramic heater 42, and the like, and the second portion 12b storing the control circuit 72, the power supply 62, and the like are detachably connected to each other through the connecting portion 13. The first and second portions 12a and 12b are electrically connected to each other through the cable 15. Therefore, this flavor generation article 10 may be used with its first and second portions 12a and 12b being integrally connected to each other through the connecting portion 13, or may be used with its first and second portions 12a and 12b being separated from each other, as shown in FIG. 5. In the state shown in FIG. 5, since the first and second portions 12a and 12b can be separated within a range allowed by the cable 15, for example, the user can place the second portion 12b in his pocket and hold only the first portion 12a in his mouth. Alternatively, the second portion 12b separated from the first portion 12a may be connected to an existing power supply, i.e., may be installed.

Several experiments using the flavor generation article 10 shown in FIG. 1 will be described.

First, as the flavor substance, some natural peppermint oil was used, and as the aerosol generation material to add smoke to the flavor, glycerin was used. Water was added to the natural peppermint oil and glycerin, thereby preparing a plurality of liquid materials 36 in which the water to glycerin concentration ratio changed in a range of about 2 : 98 to about 90 : 10. Aerosol containing a flavor substance obtained by heating each liquid material 36 was inhaled, by using the flavor generation article shown in FIG. 1, with a standard smoking condition of one cycle for about one minute in which 35 cc to 50 cc of aerosol were inhaled in one

inhaling operation for about 2 seconds with an interval of about 58 seconds.

As a result, when a liquid material having a water to glycerin concentration ratio of 50 : 50 and prepared by adding some natural peppermint oil was employed as the liquid material 36, sufficiently high discharge stability was ensured, and physical satisfaction and requirement for a visually observed smoke amount upon inhalation were achieved to a certain degree. Therefore, in the following experiments, this liquid material was used as the liquid material 36. In the following experiments as well, inhalation was performed with the standard smoking condition of one cycle for about one minute in which 35 cc to 50 cc of aerosol were inhaled in one inhaling operation for about 2 seconds with an interval of about 58 seconds, and a discharge speed of about 2.5 mg/second was employed.

With this condition, the operation timings shown in FIGS. 6 and 7 were compared. First, at the timing shown in FIG. 6, the heater was heated from room temperature to about 400°C within 2 seconds. In this case, the liquid material 36 accumulated on the heater surface while the heater increased to the temperature that enabled gasification was gasified at once, and was condensed near the discharge ports 35 because of rapid expansion or flied in the form of a liquid drop because of bumping, thus decreasing the yield. Subsequently, the heater was preheated to about 140°C to 220°C during the preheat time at the timing shown in FIG. 7, and was thereafter heated to 420°C to 440°C within 2 seconds. In this case, the liquid material 36 was effectively gasified in an interlocked manner with discharge.

The inhalation time of the user should correspond to a time period between the start and end of energization of the heater and discharge in FIG. 6, and should correspond to a time period between the start and end of energization of the heater, including the preheat time, in FIG. 7. Accordingly, the preheat time is preferably set within a range of about 0.1 second to 1 second in the standard smoking time, so that the user will not feel discomfort during inhalation, and it is required that the preheat time is not so high.

For example, when the heater was preheated to about 400°C with a preheat time of 2 seconds, the material discharged after that was rapidly gasified and expanded. Then, the proportion of the material that was condensed near the discharge ports 35 increased, inversely decreasing the yield. Also, since the inhalation operation was allowed with the lapse of 2 seconds after the user held the sensor 73 of the suction port 22 in his mouth, a time lag occurred to make the user feel discomfort. In this experiment, with the operation timings shown in FIG. 7, preheat from room temperature to 140°C spent a preheat time of about 0.5 second, and preheat to 220°C spent a preheat time of about 1 second.

When the surface of the ceramic heater 42 had no porous layer 46 but was flat, a phenomenon in which the liquid material 36 was not easily caught by the heater surface but was bounded was observed. In this case, at either timings shown in FIG. 6 or 7, the yield tended to decrease.

Regarding the main inhalation air which flowed through the throttle hole 20 and passed through the gap 27, the higher the flow velocity to a certain degree, the better the gasification efficiency of the liquid material. Concerning this, under the standard smoking condition of 35 cc to 50 cc per inhalation for 2 seconds, a desired result was obtained when the position of the throttle hole 20 was within about 30 mm from the center of the gap 27 and the velocity of air passing through the throttle hole 20 was equal to or higher than about 6 m/second. This corresponds to the sectional area of the opening of the throttle hole 20 of about 3 mm^2 or less. However, it is nonsense to decrease the sectional area of the opening (to increase the flow velocity) to such a degree that it becomes impossible for the user to perform inhalation with his mouth. Considering the above respects, the lower limit of the sectional area of the opening of the throttle hole 20 is supposed to be preferably about 0.6 mm^2.

The size of the gap 27, i.e., the vertical distance between the discharge ports 35 and ceramic heater 42 also influenced the gasification efficiency of the liquid material 36. In order to suppress a decrease in yield caused by condensation of the gas near the discharge ports 35, the ceramic heater 42 and discharge ports 35 must oppose each other through a distance equal to or larger than about 2 mm.

Several flavor generation articles according to other embodiments of the present invention will be described. In the drawings indicating these embodiments, portions that are common to the preceding drawings are denoted by the same reference numerals, and a detailed description thereof will be omitted.

FIG. 8 is a schematic view showing a flavor generation article according to another embodiment of the present invention.

The flavor generation article of this embodiment is similar to the flavor generation article shown in FIG. 1, but the orientation of discharge ports 35 of a discharge head 34 is different from that of the structure shown in FIG. 1 by 90° , so that the discharge ports 35 may be directed to a suction port 22. Accordingly, a ceramic heater 42 opposing the discharge ports 35 is set such that its direction is different from that of the structure shown in FIG. 1 by 90° . Since the discharge head 34 is arranged in a throttle hole 20, the substantial opening of the throttle hole 20 that serves as a gas flow path 26 is regulated by the size of both the throttle hole 20 and discharge head 34.

FIG. 9 is a schematic view showing a flavor generation article according to still another embodiment of the present invention.

The characteristic feature of the flavor generation article of this embodiment resides in that, first, a casing

12 cannot be separated into first and second portions 12a and 12b (see FIG. 1), and a liquid material 36, a discharge head 34, a ceramic heater 42, a power supply 62, a control unit 72, and the like are incorporated in one casing main body 14. However, a mouthpiece 16 is detachably mounted on the casing main body 14 through a connecting portion 18, and a suction port 22 is formed in the mouthpiece 16. The mouthpiece 16 is made of a material, e.g., a plastic or wood. As the connecting portion 18, a known structure, e.g., a screw or a fitting pair can be employed. In place of the mouthpiece 16, a filter may be inserted in the casing main body 14 and served for use.

The discharge head 34 provided to a material container 32 has one discharge port 35 which is oriented to discharge the liquid material 36 toward the suction port 22. Accordingly, the ceramic heater 42 opposing the discharge port 35 is oriented in the same direction as that of the structure shown in FIG. 8. No throttle plate 21 (see FIG. 1) is disposed in a gas flow path 26. Air that has flowed into the article flows on the ceramic heater 42 because it is regulated by a support member 44 supporting the ceramic heater 42.

FIG. 10 is a schematic view showing a flavor generation article according to still another embodiment of the present invention.

The flavor generation article of this embodiment is similar to the flavor generation article shown in FIG. 9 but is largely different from it in that its material container 32 is manually operated to discharge. For this reason, the material container 32 is connected to an operation lever 76 projecting outside a casing main body 14. When the lever 76 is depressed, a material corresponding to one puffing operation is emitted from a discharge port 35, and is supplied onto a ceramic heater 42 in the form of a liquid splash or liquid drop. A control circuit 72 receives a signal indicating a depressing operation of the lever 76, and supplies power to the ceramic heater 42 based on this signal to heat it, thereby gasifying the material splash. In fine, the lever 76 serves as both the discharge drive portion 38 for the flavor generation article and the sensor 73 for detecting the inhaling operation of the user that are shown in FIG. 1.

In the flavor generation article shown in FIG. 10, the material container 32 is also connected to an injection port 82 for replenishing the material container 32 with a liquid material 36. The end portion of the injection port 82 is exposed outside the casing main body 14, and the liquid material can be injected and replenished to the material container 32 through this end portion. As described above, the material container 32 has a capacity sufficient for storing the liquid material 36 in an amount corresponding to the total discharge amount of a plurality of puffing operations of the user. However, if the material can be replenished, the material container 32 need not be exchanged, but this flavor generation article can be used further continuously.

In order to observe the remaining amount in the material container 32, a transparent inspection window 84 is formed in the side wall of the casing main body 14 to correspond to the material container 32. Accordingly, in this case, the material container 32 itself is also a transparent or translucent container. When the remaining amount of the liquid material 36 in the material container 32 is monitored through the inspection window 84, the user can know the timing at which the container should be replenished with the material.

In place of the arrangement shown in FIG. 10, a combination of an electric remaining amount detection means and an electric display means can be used to monitor the remaining amount in the material container 32. An example of the electric remaining amount detection means includes a means for detecting a change in conductivity of the material container 32, and an example of the electric display means includes a means for using a light-emitting diode disposed on the outer surface of the casing main body 14. As the mechanism for monitoring the remaining amount in the material container 32, a method that optically detects the remaining amount by using a prism may also be employed.

In the flavor generation article shown in FIG. 10, furthermore, a power supply 62 is stored in a power supply holder 66 which is detachably mounted on the casing main body 14 through a connecting portion 68. As the connecting portion 68, a known structure, e.g., a screw or a fitting pair, can be employed. When the power supply holder 66 having a length corresponding to the size of the power supply 62 is used, exchange of the power supply 62 is facilitated, and repair and exchange of members in the casing main body 14 are also facilitated.

FIG. 11 is a schematic view showing a flavor generation article according to still another embodiment of the present invention.

The flavor generation article of this embodiment is similar to the flavor generation article shown in FIG. 10 but is different from it in that a discharge operation lever 76 is connected to an atomizer 86 provided to a discharge port 35. The atomizer 86 can supply a material corresponding to one puffing operation onto a ceramic heater 42 in the form of a liquid splash or liquid drop.

In the flavor generation article shown in FIG. 11, a filler 56 is disposed in a cooling chamber 52. When the filler 56 is disposed, the cooling effect of the gasified flavor component can be promoted, and the pressure loss can be adjusted so that the flavor component can be inhaled with an appropriate pressure. As the filler 56, for example, a fiber formed body made of cellulose acetate or pulp, or a particulate matter, e.g., glass or aluminum particles, can be used.

FIG. 12 is a schematic view showing a flavor generation article according to still another embodiment of the present invention.

The characteristic feature of the flavor generation article of this embodiment resides in that a formed body

92 of a solid material that generates a flavor or the like to be inhaled by the user is detachably disposed in a gas flow path 26 between a ceramic heater 42 and a cooling chamber 52.

The formed body 92 of the solid material can contain an extracted material and/or the constituent components of various types of natural materials in accordance with the application purpose. As the flavor material to be contained by the formed body 92, for example, menthol, caffeine, or a tobacco component, e.g., a tobacco extracted component or a tobacco smoke condensate component can be employed.

If the formed body 92 of the solid material has such a size that no gap is formed between it and the inner surface of a casing main body 14, a formed body 92 having good air permeability is used as the formed body 92. In this case, the gas flow path 26 between air intake ports 24 and a suction port 22 is formed to extend through the formed body 92. On the other hand, if the size of the formed body 92 is set such that a gap is formed between the formed body 92 and the inner surface of the casing main body 14, a formed body 92 having poor or no air permeability can be used. In this case, the gas flow path 26 between the air intake ports 24 and suction port 22 is formed to extend through the gap between the formed body 92 and the inner surface of the casing main body 14.

FIG. 13 is a schematic view showing a flavor generation article according to still another embodiment of the present invention.

The flavor generation article of this embodiment is different from the flavor generation article shown in FIG. 12 in that a coil heater 94 for heating a formed body 92 is disposed around the formed body 92. The heater for heating the formed body 92 may be arranged in a hole formed in the formed body 92.

The coil heater 94, together with a ceramic heater 42, can be controlled by a control circuit 72 so that power is supplied to them in accordance with the inhaling operation of the user. When the formed body 92 has a large heat capacity, however, even if power is supplied to the coil heater 94 in accordance with the start of the inhaling operation of the user, generation of the flavor may be retarded considerably. In such a case, the coil heater 94 may be kept heated when this article is in use, i.e., while a switch 74 is set in the ON state.

The formed body 92 has such a size that a sufficiently large gap is formed between it and the inner surface of a casing main body 14. Accordingly, the major portion of a gas flow path 26 between air intake ports 24 and a suction port 22 extends through this gap.

FIG. 14 is a schematic view showing a flavor generation article according to still another embodiment of the present invention.

The characteristic feature of the flavor generation article according to this embodiment resides in that a swing vane type sensor is used to detect the inhaling operation of the user. More specifically, a swing vane 102 is disposed in a gas flow path 26 between a ceramic heater 42 and a cooling chamber 52. An orifice 112 having an opening 114 opposing the vane 102 is disposed in the gas flow path 26 between the ceramic heater 42 and the vane 102. The vane 102 is integrally connected to a conductive lever 104 which serves as the switch lever of the sensor circuit. An electric contact 108 of the sensor circuit is disposed on the inner surface of a casing main body 14 to oppose the conductive lever 104.

The vane 102 and lever 104 are integrally, swingably, and axially supported on a support 106 on the inner surface of the casing main body 14, and is biased counterclockwise in FIG. 14 by a spring incorporated in the support 106. Accordingly, in an ordinary state, the vane 102 abuts against the orifice 112, and the lever 104 and contact 108 are not in contact with each other. However, when the user starts an inhaling operation, the gas flow, the flow velocity of which is increased by the orifice 112, pivots the vane 102 clockwise in FIG. 14, so that the lever 104 and contact 108 come into contact with each other. The inhaling operation signal of the user which is detected in this manner by the swing vane type sensor is transmitted to a control circuit 72. Based on this detection signal, a discharge drive portion 38 and the ceramic heater 42 can be controlled.

FIG. 15 is a schematic view showing a flavor generation article according to still another embodiment of the present invention.

The characteristic feature of the flavor generation article according to this embodiment resides in that a contact sensor is used in order to detect the inhaling operation of the user. More specifically, electric contacts 122 and 124 each made of an annular conductive plate are disposed at the center and the suction port-side end portion, respectively, of the outer surface of a casing 12. The electric contacts 122 and 124 constitute the switch of a sensor circuit. When the electric contacts 122 and 124 are connected to each other through a conductor, the sensor generates a detection signal. This state occurs when, e.g., two conditions that the user holds the electric contact 122 at the center with his hand and holds the suction port-side electric contact 124 in his mouth are satisfied simultaneously. The inhaling operation signal of the user which is detected by the contact sensor in this manner is transmitted to a control circuit 72. A discharge drive portion 38 and a ceramic heater 42 can be controlled based on this detection signal.

FIG. 16 is a schematic view showing a flavor generation article according to still another embodiment of the present invention.

The flavor generation article of this embodiment has discharge ports 35 of a discharge head 34 that are oriented in the same direction as that of the flavor generation article shown in FIG. 1, and a ceramic heater 42 opposing the discharge ports 35. However, a casing 12 cannot be separated into first and second portions 12a and 12b (see FIG. 1), and a liquid material 36, the dis-

charge head 34, the ceramic heater 42, a power supply 62, a control unit 72, and the like are incorporated in one casing main body 14.

Although no throttle plate 21 (see FIG. 1) is disposed in a gas flow path 26, a support member 44 of the ceramic heater 42 is formed to have a slit only at its central portion corresponding to the discharge head 34. Accordingly, air flowing through air intake ports 26 entirely passes through the gap between the discharge port 35 and the ceramic heater 42.

The characteristic features of the respective portions of the present invention have been described divisionally by way of several embodiments in order to facilitate understanding of the present invention. These characteristic features can be appropriately combined in accordance with the object. More specifically, the present invention can be practiced in various embodiments other than those shown in the drawings within the spirit and scope of the invention.

Claims

1. A flavor generation article characterized by comprising:

   a casing having an air intake port for taking in air therein and a suction port through which a user inhales a flavor, and forming a gas flow path between said intake port and said suction port;
   a material container for storing a liquid material which contains at least a flavor substance and having a discharge port for said material, said material container being mounted on said casing;
   discharge driving means for discharging said material from said container through said discharge port in the form of a liquid drop;
   gasifying means disposed in said gas flow path to receive the liquid drop of said material discharged from said container and gasify said material by electrically heating the liquid drop; and
   a power supply for supplying electric energy to said gasifying means.

2. A flavor generation article according to claim 1, characterized by further comprising a sensor for detecting an inhaling operation of the user and control means for controlling, based on a signal from said sensor, said discharge driving means so as to discharge said material from said container.

3. A flavor generation article according to claim 2, characterized in that said sensor comprises a pressure-sensitive sensor mounted on said casing around said suction port.

4. A flavor generation article according to claim 2 or 3, characterized in that said control means controls said gasifying means based on the signal from said sensor so that said gasifying means generates heat.

5. A flavor generation article according to claim 4, characterized in that said control means controls said gasifying means and said discharge driving means so as to preheat said gasifying means prior to discharge of said material.

6. A flavor generation article according to claim 1, characterized in that said power supply is disposed in said casing.

7. A flavor generation article according to claim 6, characterized in that said casing is constituted by first and second portions that are electrically connected to each other through a cable, said gas flow path, said container, said discharge driving means, and said gasifying means being disposed in said first portion, and said power supply being disposed in said second portion.

8. A flavor generation article according to claim 7, characterized in that said first and second portions of said casing are detachably connected to each other through a connecting portion.

9. A flavor generation article according to claim 1, characterized by further comprising an operation lever for manually operating said discharge driving means.

10. A flavor generation article according to any one of claims 1 to 9, characterized in that said gasifying means comprises a porous layer, and the liquid drop of said material is supplied onto said porous layer.

11. A flavor generation article according to any one of claims 1 to 10, characterized in that said gasifying means is arranged to oppose said discharge port, and a throttle hole for directing air flowing from said air intake port toward a gap between said discharge port and said gasifying means is disposed in said gas flow path.

12. A flavor generation article according to any one of claims 1 to 11, characterized in that said casing is formed with an outer air inlet hole in order to supply an outer air into said gas flow path between said gasifying means and said suction port.

13. A flavor generation article according to any one of claims 1 to 12, characterized by further comprising a formed body of a solid material containing at least

a flavour substance and disposed in said gas flow path so as to be located between said gasifying means and said suction port.

14. A flavor generation article according to claim 13, characterized by further comprising heating means for heating said formed body.

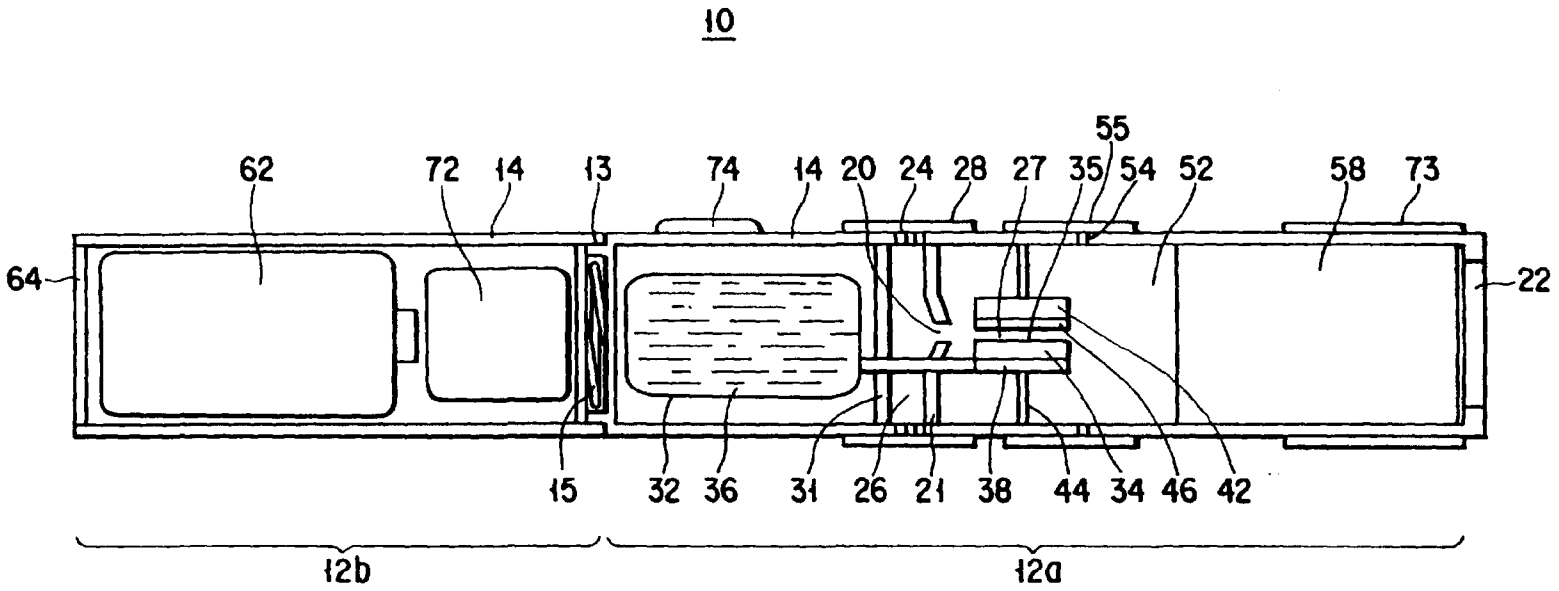

FIG. 1

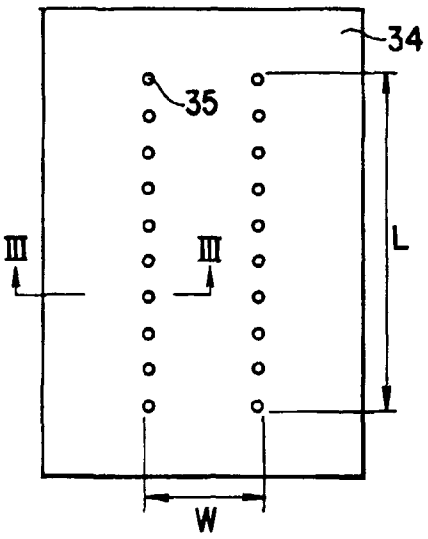

FIG. 2

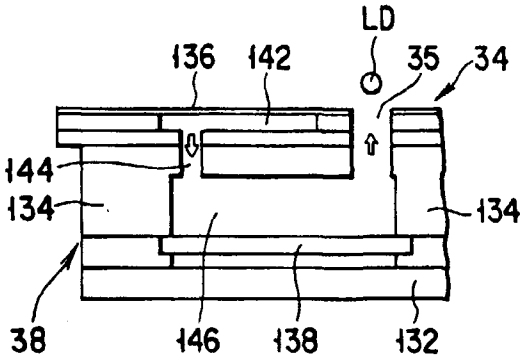

FIG. 3

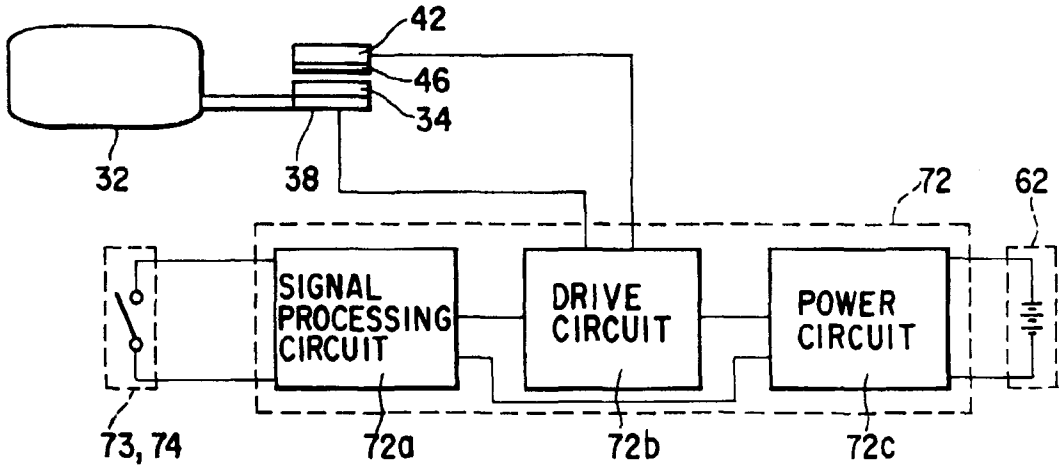

FIG. 4

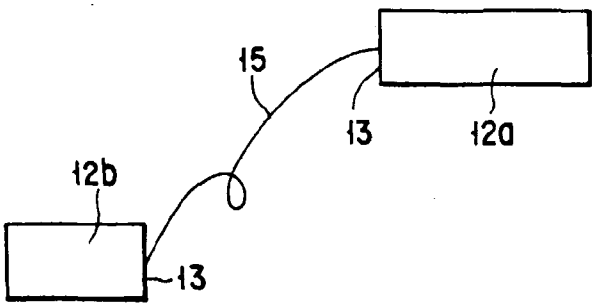

FIG. 5

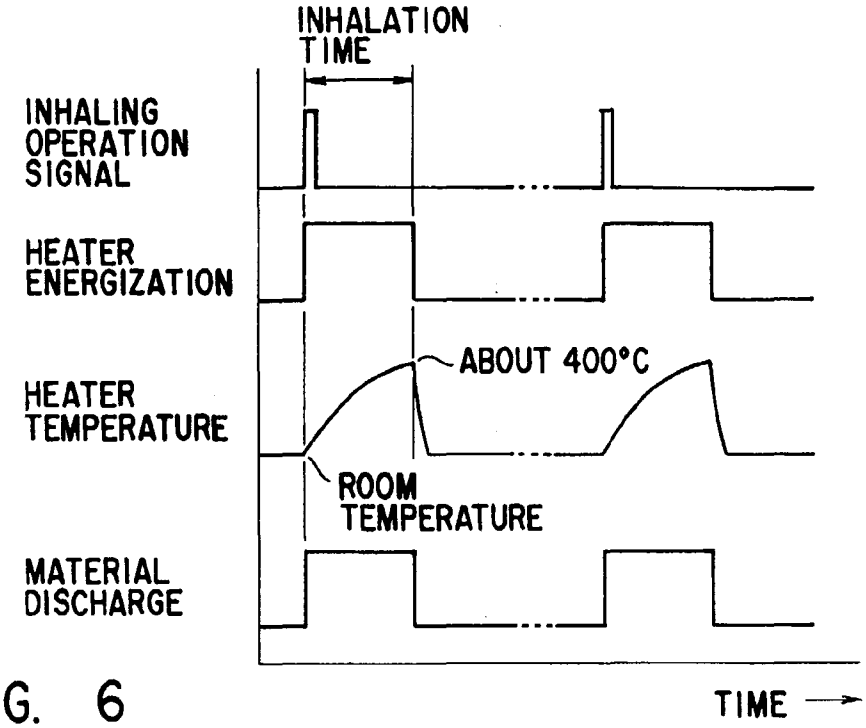

FIG. 6

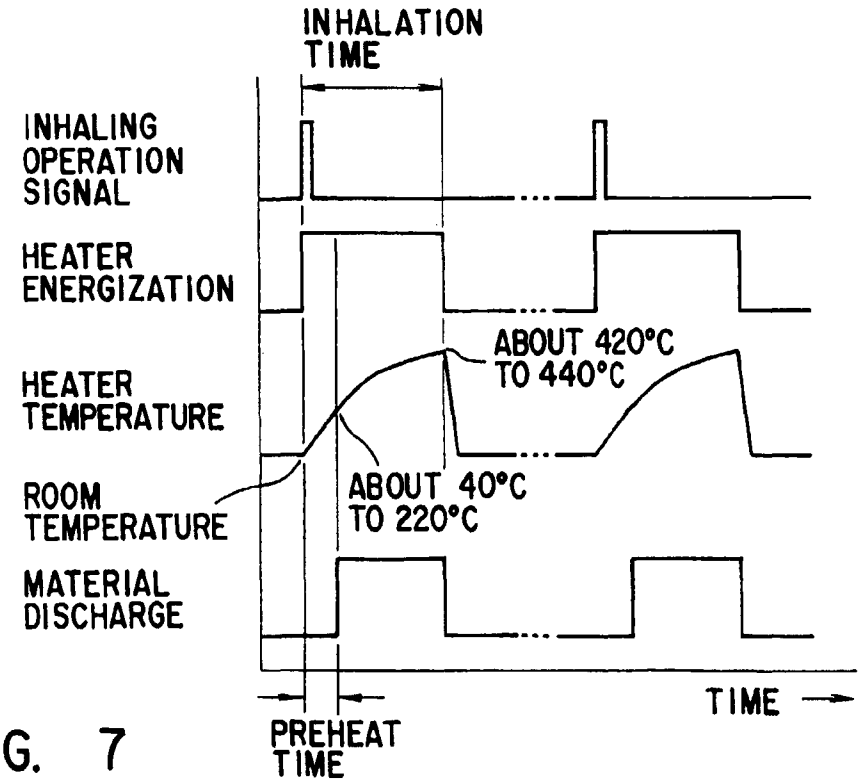

FIG. 7

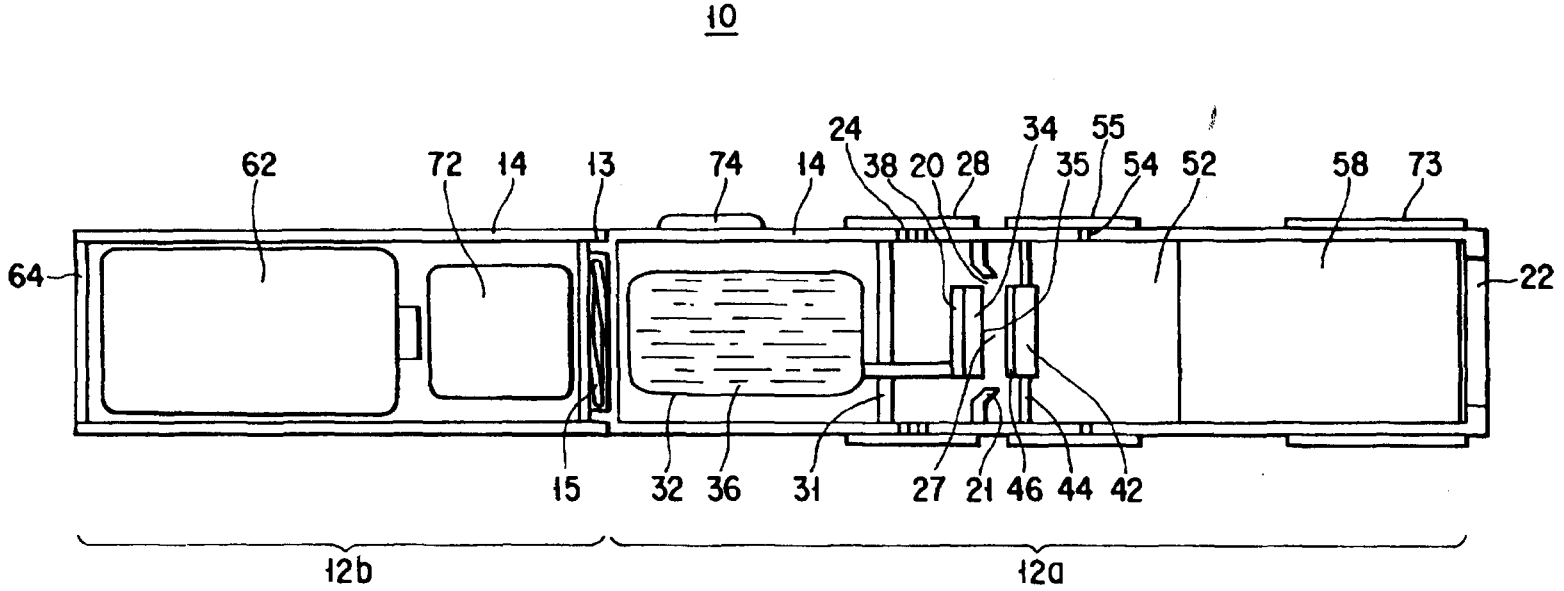

FIG. 8

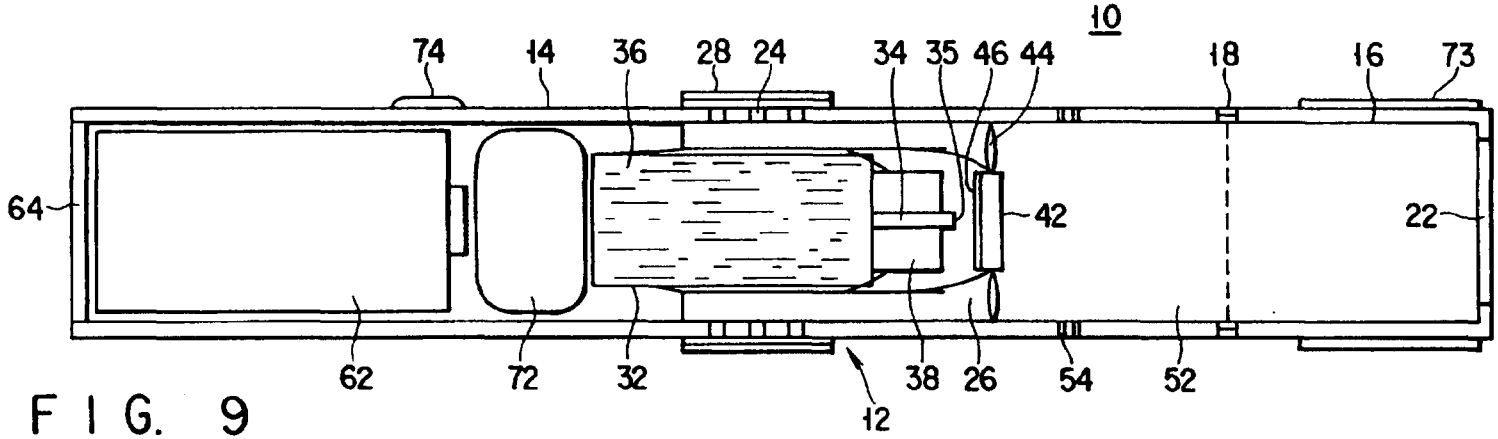

FIG. 9

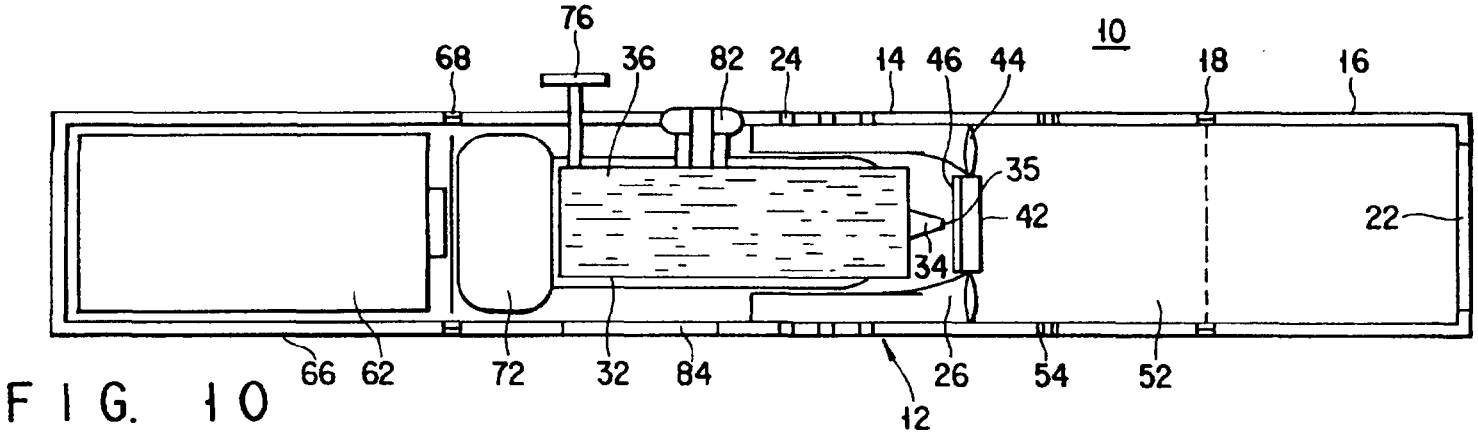

FIG. 10

EP 0 845 220 A1

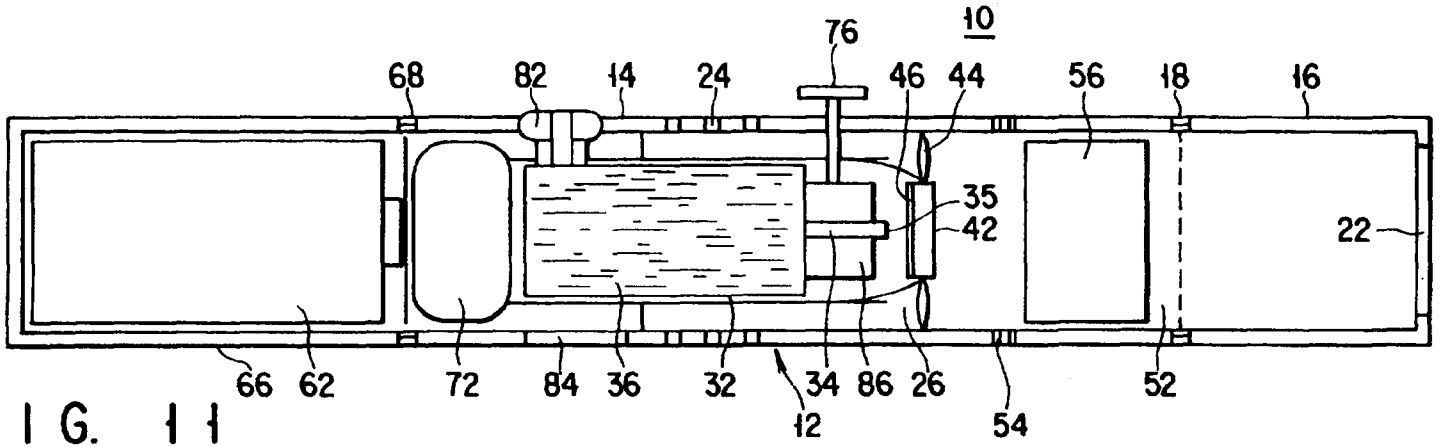

FIG. 11

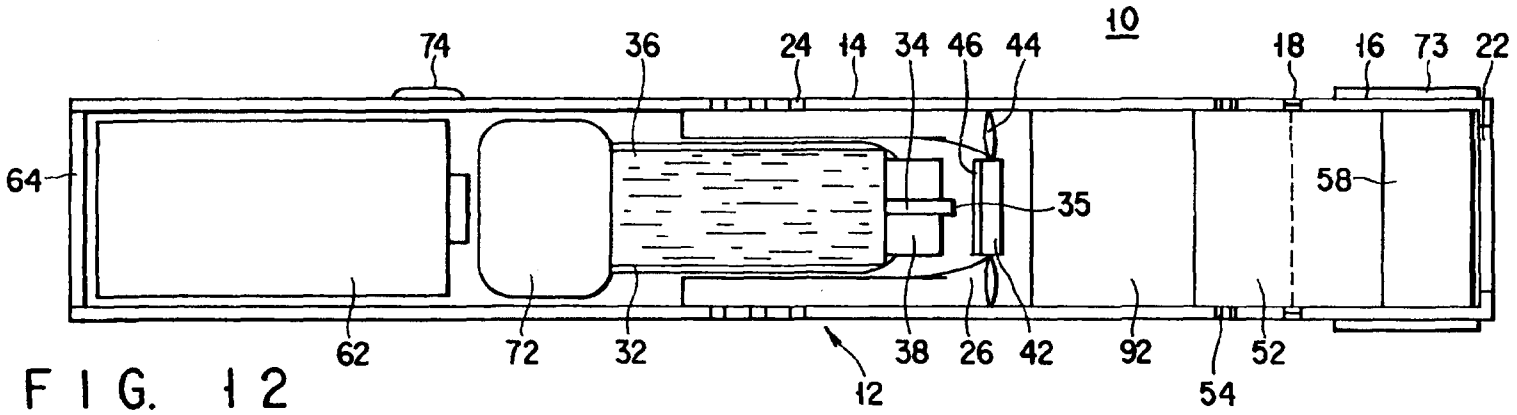

FIG. 12

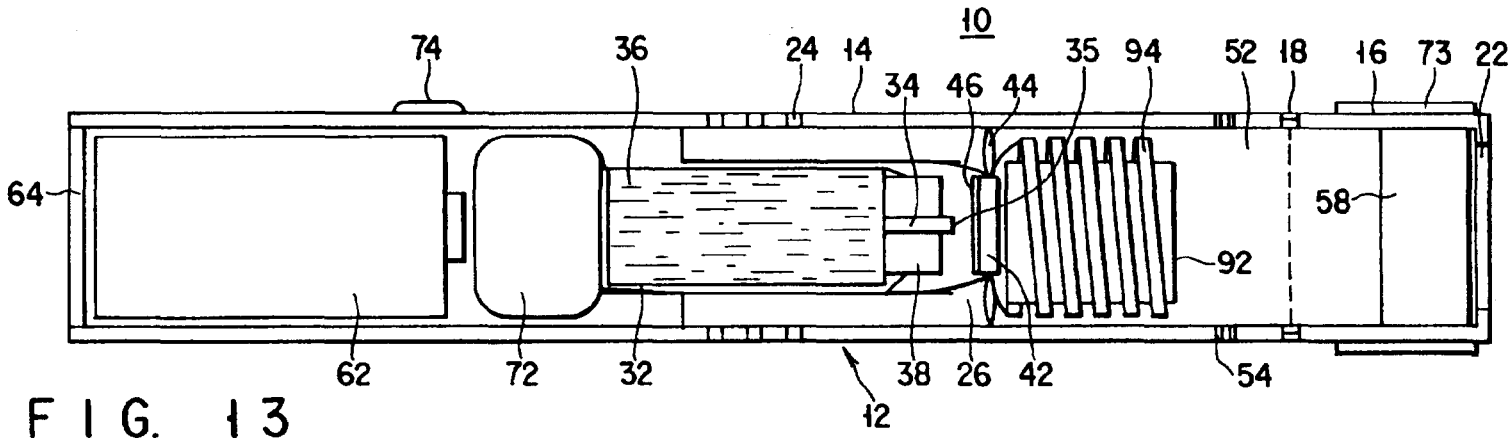

FIG. 13

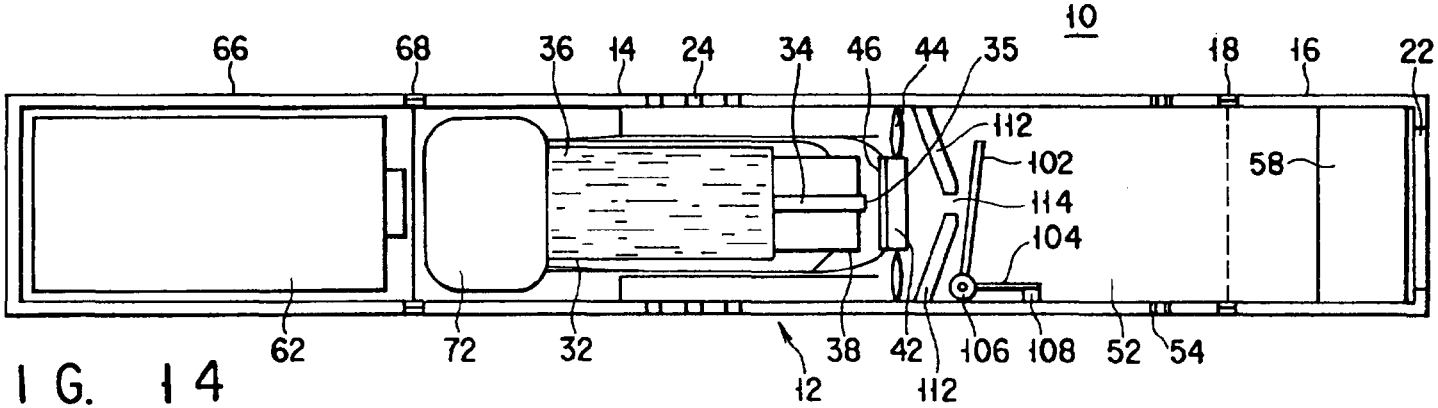

FIG. 14

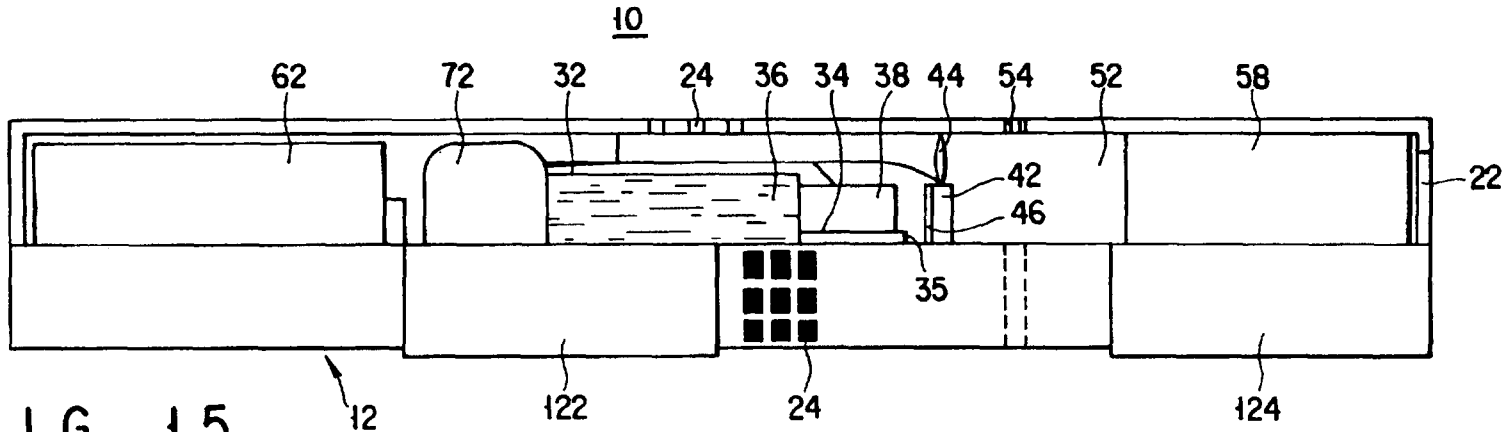

FIG. 15

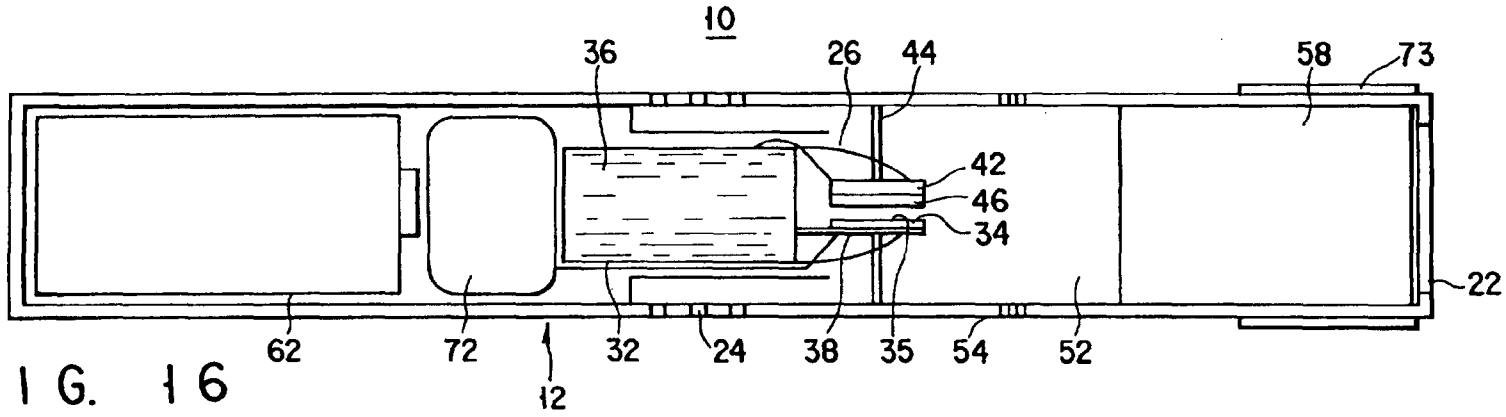

FIG. 16

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP97/01953

A. CLASSIFICATION OF SUBJECT MATTER
Int. Cl^6 A24F47/00 // A61M15/06
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)
Int. Cl^6 A24F47/00, A61M15/06

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.
A	JP, 48-8231, B1 (Kikuo Takeda), March 12, 1973 (12. 03. 73)(Family: none)	1 - 14
A	US, 4303083, A (Robert P. Burruss, Jr.), December 1, 1981 (01. 12. 81)(Family: none)	1 - 14
A	US, 4735217, A (The Procter & Gamble Co.), April 5, 1988 (05. 04. 88)(Family: none)	1 - 14
A	US, 4846199, A (The Regents of the University of California), July 11, 1989 (11. 07. 89) & US, 4945928, A & US, 5316759, A	1 - 14
A	JP, 2-124081, A (R.J. Reynolds Tobacco co.), May 11, 1990 (11. 05. 90) & US, 4922901, A & US, 4947875, A & EP, 358114, A2	1 - 14
A	JP, 2-124082, A (R.J. Reynolds Tobacco Co.), May 11, 1990 (11. 05. 90),	1 - 14

[X] Further documents are listed in the continuation of Box C. [ ] See patent family annex.

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"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
July 30, 1997 (30. 07. 97)	August 12, 1997 (12. 08. 97)
Name and mailing address of the ISA/ Japanese Patent Office Facsimile No.	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (July 1992)

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(54) Title: ORAL SUCTION TYPE PORTABLE ATOMIZING BODY CARE DEVICE

(54) 发明名称: 口吸式便携雾化保健仪

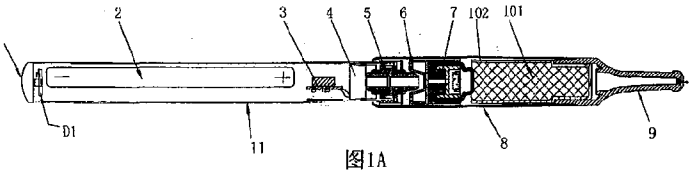

图1A

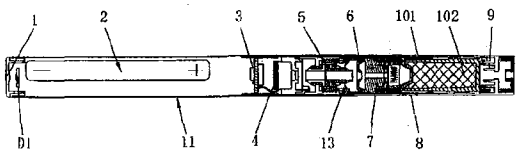

图1B

(57) **Abstract**: An oral suction type portable atomizing body care device has a control assembly and an executive assembly. The control assembly includes a housing (11), a secondary battery (2) mounted in the lumen of the housing (11), a control circuit board assembly (3), an air sensor (4) and a boding conductor (5) for connecting to the executive assembly. One end of the boding conductor (5) is fixedly connected to the housing (11), the other end is out of the lumen of the housing (11). The executive assembly includes a casing (8), a nozzle (9), a fluid-resisting device (6), an atomizer (7) with an electric heater unit, and a soft liquor storage with a porous structure. One end of the nozzle (9) is fixedly connected to the casing (8). The fluid-resisting device (6) is interference fitted in the casing (8). The atomizer (7) and the soft liquor storage are clearance fitted in the casing (8). The atomizer (7) and the soft liquor storage are between the fluid-resisting device (8) and the nozzle (9).

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(57) 摘要:

一种口吸式便携雾化保健仪包括控制组件和执行组件。控制组件包括外壳（11）、安装在外壳（11）内腔中的充电电池（2）、控制线路板组件（3）、气体感应器（4）以及用于与执行组件连接的连接导体（5）。连接导体（5）的一端与外壳（11）固定连接，另一端位于外壳（11）的腔体外。执行组件包括壳体（8）、吸嘴（9）、阻液器（6）、带电加热装置的雾化器（7）以及具有多孔结构的软体药液存储器。吸嘴（9）的一端与壳体（8）左端固定连接。阻液器（6）过盈配合在壳体（8）中。雾化器（7）以及软体药液存储器间隙配合于壳体（8）中。雾化器（7）以及软体药液存储器位于阻液器（6）与吸嘴（9）之间。

口吸式便携雾化保健仪

技术领域

本实用新型涉及一种保健仪，特别涉及一种口吸式便携雾化保健仪。

背景技术

当今世界，环境问题已经成为人类生存与发展所面临的首要问题，而空气污染又是环境问题中最为严峻的问题之一，气车尾气，工业废气，沙尘，公共场合的二手烟，等等，一系列的空气污染严重威胁着人类的健康。

虽然联合国环境保护组织近年来努力采取多种必要的措施，各国政府也为此做出许许多多的努力，但由于几个世纪以来形成的污染问题不是一朝一夕就能改变的。出于对健康及美好生活的向往，人们做出的不懈的努力，植物公园，氧吧，绿色社区等诸多人利于健康的场合，以供有些人使用。但这些场所点用资源巨大，消费高昂，另许多普通消费者望而确步；也有一些实用新形将提神醒脑的药液注入大型诸如吸氧机，呼吸机等设备，供使用者使用，也有一定的实用价值，但这些设备大多体积庞大，需要专们的场地，设备操作复杂，也不利于推广。

人们的生活及社会活动的加强，人与人之间的交往也越来越重要，而口腔异味等问题另许多人困惑不堪，虽然也有口香糖、润喉片等物品可以解决一时之需，但其废弃物又产生的新的环境污染，如吃过的口香糖，包装锡板等。

早期有人提出将药液经过机械装置加热供使用者使用，虽然使用者在使用习惯上易于接受，但由于传统的机械结构性能不稳定，极易损坏，操作烦琐。使使用者造成损失。随着科技的发展，目前出现了超声雾化器。与机械装置加热实现液体雾化不同的是，基于特定频率下超声波对液体的振荡激发作用，可以产生对应的雾化微滴，从而输送到人体口腔内产生吸烟的感觉。这种雾化方案有些类似于家庭中常见的超声加热器，但超声雾化器存在雾化量偏小、且能量利用不充分的问题。

发明内容

针对上述技术问题，本实用新型的目的是提供一种口吸式便携雾化保健仪，它能充分使存储的药液进行雾化，去除药液中所含有害物质，本实用新型具有去除高效、微型、便于携带的优点。

本实用新型的目的是通过以下技术方案实现的：

包括控制组件以及与该控制组件连接为一体的执行组件，所述控制组件包括外壳，以及安装于外壳内腔中的充电电池、控制线路板组合、气体感应器以及用于与执行组件连接的连接导体，其中连接导体一端与外壳固定连接，连接导体另一端外位于外壳的腔体外；

所述执行组件包括壳体，吸嘴、阻液器、电加热装置的雾化器以及具有多孔结构的软体药液存储器，吸嘴的一端与的壳体左端固定连接，阻液器过盈配合在壳体中，雾化器以及软体药液存储器间隙配合于壳体中，雾化器以及软体药液存储器位于阻液器与吸嘴之间，其中雾化器一端与阻液器接紧靠，雾化器的电子加热装置与所述控制组件的控制线路板组合电连接，软体药液存储器一端插入吸嘴中与吸嘴间隙配合。

采用了上述方案，执行组件包括壳体，吸嘴、阻液器、电加热装置的雾化器以及具有多孔结构的软体药液存储器，阻液器能够阻止药液流动到控制组件内，可对控制组件进行保护。雾化器中电加热装置对药液加热后形成雾气，由于软体药液存储器具有多孔结构，使用时能以均匀的方式使药液从软体药液存储器流出，使药液在电加热时能增强药液的雾气量，去除药液中的有害物质，增提高药液的使用效率。本实用新型的软体药液存储器可以进行更换，因此，可以更换成装有不同药液的软体药液存储器，以满足消费者的需求，节约使用成本，拓宽本实用新型的使用范围。

本实用新型除具有上述优点外，由于体积小，可以随身携带，以便于随时随地使用；可以加入多种符合使用者需求的各种保健液，可以润喉，提神， 强身，其药液的配方可以根据当地规定进行合理的搭配。

下面结面附图和具体实施方式对本实用新型作进一步说明。

附图说明

图 1A 是本实用新型的一种实施例的整体结构示意图；

图 1B 是本实用新型的另一种实施例的整体结构示意图；

图 2 是实施例中电子线路板的部分原理示意图；

图 3 是图 1 中的雾化器的结构示意图；

1 为指示灯盖，2 为充电电池，3 为控制线路板组合，4 为气体感应器，5 为连接导体，6 为阻液器，7 为雾化器，701 为电加热器，702 为油嘴座，703 为喷射孔，705 为导液装置，706 为油嘴支架，8 为壳体，9 为吸嘴，101 为腔体，102 为填充层， 11 为外壳，13 为振动膜片。

具体实施方式

参照图 1A 及 1B，本实用新型的口吸式便携雾化保健仪包括控制组件以及与该控制组件连接为一体的执行组件，所述控制组件包括外壳 11，以及安装于外壳内腔中的充电电池 2、控制线路板组合 3、气体感应器 4 以及用于与执行组件连接的连接导体 5。充电电池 2 为锂电池。气体感应器 4 通过开关与控制线路板组合 3 电连接，气体感应器 4 主要用于感应低频气流振动，气体感应器在气体低频振动下会发出电信号，并将此信号输送给控制线路板组合 3 的单片机进行分析，单片机将合适的信号转换成开关信号，即可实现在小气流的作用下接通和断开开关，从而控制执行组件中的加热装置进行加热。连接导体 5 一端与外壳 11 固定连接，连接导体 5 插入外壳 11 中以卡接的方式与外壳固定连接，连接导体另一端外位于外壳的腔体外，该位于外壳 11 腔体外的一端设有外螺纹。为使能形成较大振动，连接导体 5 上设有振动膜片 13（如图 1B 所示）。连接导体 5 上与充电电池 2 电连接，连接导体连入充电器后可实现对充电电池 2 进行充电。外壳 11 呈圆筒状，外壳 11 的另一端连接一个半透明的指示灯盖 1，该灯盖内设有一个与控制线路板组合 3 电连接的指示灯 D1，该指示灯 D1 为一个发光二极管，指示灯用于指示保健仪的使用状态，在指示灯侧开有一隐蔽的通气孔。指示灯盖 1 至连接导体方向 5 依次安装充电电池 2、控制线路板组合 3、气体感应器 4，气体感应器 4 四周通过软性塑料与壳体将充电电池 2、

控制线路板组合 3 以及连接导体 5 分成两个相对独立的腔室。

如图 2 所示，控制线路板组合 3 由逻辑电路、开关电路、高频发生器、电子延时电路、电子清洁复位开关、加热器电路以及控制这些电路的单片机组成（部分电路单元在图中未示出）。其中单片机控制用 4.2V 的充电电池 2 供电，单片机 IC1 为核心智能控制单元，主要负责接收并判别输入信号，同时对信号指示灯与执行组件中的加热器装置进行控制。单片机 IC1 以十秒每次检测电池电压，首先判断此时电源电压是否高于 3.3V，如果是，则在对气体感应器 4 发出的信号进行分析后，对符合规则的信号转换成开关信号，输出控制信号给加热电路，三极管 Q1 对输出电信号进行放大，发热丝接通电源发热，加热器工作，把液态的药液瞬间加热，同时输出显示信号使指示灯 D1 发出红色或橙色光，也可输出延时信号使指示灯 D1 灯渐亮或渐灭。如果电池电压低于 3.3V，则关闭气体感应器，此时加热室不产生任何动作，当整机无动作时，IC1 进入休眠状态。当使用都在一分钟内连续使用本装置十五次时，IC1 将发出信号，切断加热电路输出，同时输出信号给指示灯 D1，连续闪烁 10 秒；当连续接通 6 秒以上时，则自动切断加热电路，同时输出信号给指示灯 D1 等。此单片机还可写入其它程序以实现更多的功能和为后序的更新改善提供便利。也可以在信号输出端接一 LCD 显示屏来显示更多的信息。此单片机具有记数锁存功能和低电压提示功能，当使用过于频繁的使用本机时，会自动断开电源，以帮助使用都合理使用本产品。当开关动作到 300 次时单片机会发出清洗指令，让雾化头自动清洗 6 秒钟；当电池电压过低时，指示灯会连续闪烁 20 秒钟提示电压过低，关且关闭电源输出端。

参照图 1A、图 1B 以及图 3，执行组件包括壳体 8、吸嘴 9、阻液器 6、电加热装置的雾化器 7 以及具有多孔结构的软体药液存储器，壳体 8 一端设有内螺纹，壳体 8 通过该内螺纹与连接导体 5 螺纹连接，使控制组件与执行组件连接为一个整体。吸嘴 9 的一端与的壳体 8 另一端固定连接，吸嘴 9 与壳体可以通过粘结方式固定为一个整体。阻液器 6 过盈配合在壳体中，阻液器 6 位于壳体 8 设有内螺纹的一端。雾化器 7 以及软体药液存储器间隙配合于壳体中，雾

化器 7 以及软体药液存储器位于阻液器与吸嘴之间，其中雾化器一端与阻液器紧靠，雾化器 7 的电子加热装置与所述控制组件的控制线路板组合电连接，药液存储器一端插入吸嘴中与吸嘴间隙配合。雾化器 7（如图 3）包括油嘴支架 706、固定在油嘴支架 706 外壁面上的导液装置 705 以及固定于该油嘴支架内壁面的油嘴座 702。导液装置 705 呈“凸”字形状，该导液装置的一端与软体药液存储器接触。导液装置 705 为多层泡沫镍网制成的导液装置，或者为不锈钢纤维毡制成的导液装置，或者为高分子多聚物发泡体及泡沫陶瓷制成的导液装置，本实施例中的导液装置采用多层泡沫镍网制成。导液装置 705 通过毛细浸润作用将药液导至阻液片与油嘴座之间的空腔内，在气流的作用下，将小液滴通过油嘴座 702 上设置的喷射孔 703 吸入油嘴座的另一侧，在电加热装置的作用下，液体瞬间雾化。油嘴座 702 的一端设有喷射孔 703，油嘴座的另一端安装有电加热器 701，该电加热器可用铂丝、镍铬合金或含有稀土元素的铁铬铝合金丝制成，也可制成片状体或环状。软体药液存储器包括腔体 101 以及固定于该腔体内的填充层 102，填充层由聚丙纤维或绦纶纤维或尼龙纤维制成。

本实用新型的工作过程如下：当使用者抽吸时为保健仪提供一个负压，从而引起执行组件及控制组件振动，气体感应器 4 感应到该振动后将该振动信号转变为电信号，启动控制线路板组合 3 工作，控制线路板组合 3 中的单片机 IC1 将收到的电信号经采样分析后转为开关信号，此时指示灯 D1 在延时电路控制下慢慢变亮，同时从控制线路板组合 3 输出的加热电流通过连接导体 5、阻液器 6 导通到雾化器 7。由于气流作用将软体药液存储器中的药液在负压作用力下，通过导液装置 705 毛细浸润作用，以微滴的形式将药液导至阻液片与油嘴座之间的空腔内，在电加热器 701 的作用下，使药液瞬间雾化。药液雾化后的大直径微滴在涡流的作用下附壁经溢流孔被导液装置 705 重吸收，小直径微滴悬浮在负压气流中形成气溶胶经喷射孔流出，再经壳体 8 和软体药液存储器以及吸嘴 9 之间的间隙进入吸嘴 9 中，最终吸入到使用者的口中。

权 利 要 求

1．一种口吸式便携雾化保健仪，包括控制组件以及与该控制组件连接为一体的执行组件，其特征在于：所述控制组件包括外壳，以及安装于外壳内腔中的充电电池、控制线路板组合、气体感应器以及用于与执行组件连接的连接导体，其中连接导体一端与外壳固定连接，连接导体另一端外位于外壳的腔体外；所述执行组件包括壳体，吸嘴、阻液器、电加热装置的雾化器以及具有多孔结构的软体药液存储器，吸嘴的一端与的壳体左端固定连接，阻液器过盈配合在壳体中，雾化器以及软体药液存储器间隙配合于壳体中，雾化器以及软体药液存储器位于阻液器与吸嘴之间，其中雾化器一端与阻液器接紧靠，雾化器的电子加热装置与所述控制组件的控制线路板组合电连接，软体药液存储器一端插入吸嘴中与吸嘴间隙配合。

2．根据权利要求 1 所述的口吸式便携雾化保健仪，其特征在于：所述控制组件的连接导体上设有振动膜片。

3．根据权利要求 1 所述的口吸式便携雾化保健仪，其特征在于：所述雾化器包括油嘴支架、固定在油嘴支架外壁面上的导液装置以及固定于该油嘴支架内壁面的油嘴座，油嘴座的一端设有喷射孔，油嘴座的另一端安装有电加热器。

4．根据权利要求 3 所述的口吸式便携雾化保健仪，其特征在于：所述导液装置为多层泡沫镍网制成的导液装置，或者为不锈钢纤维毡制成的导液装置，或者为高分子多聚物发泡体及泡沫陶瓷制成的导液装置。

5．根据权利要求 1 所述的口吸式便携雾化保健仪，其特征在于：所述软体药液存储器包括腔体以及固定于该腔体内的填充层，填充层由聚丙纤维或绦纶纤维或尼龙纤维制成。

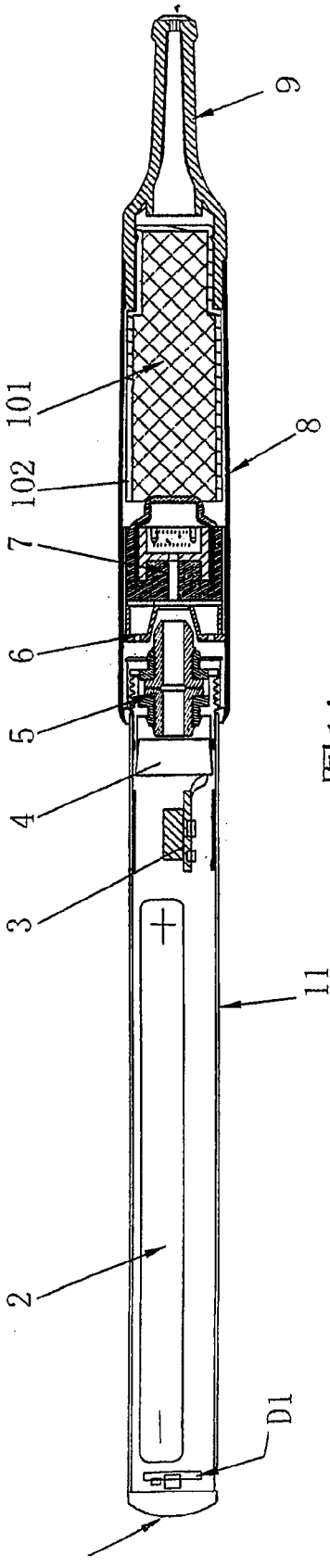

图1A

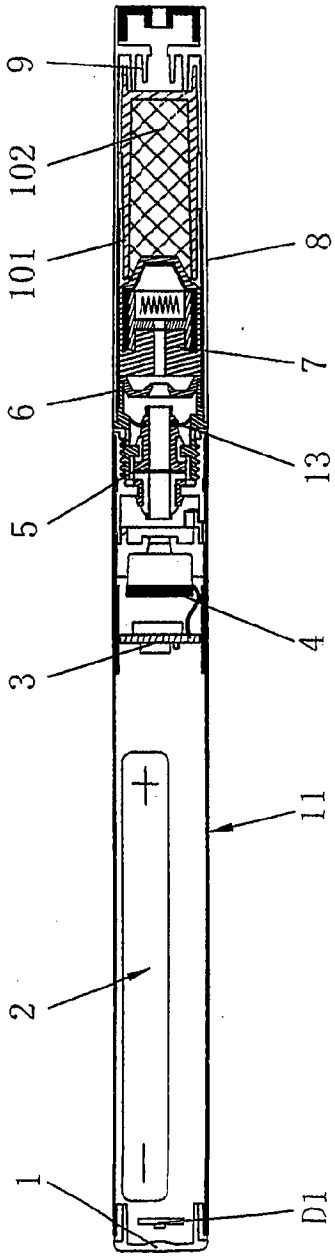

图1B

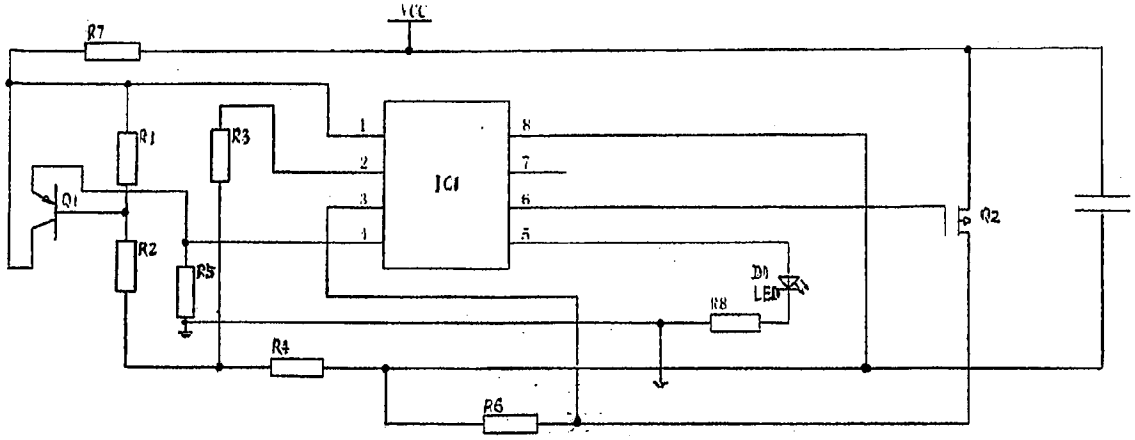

图2

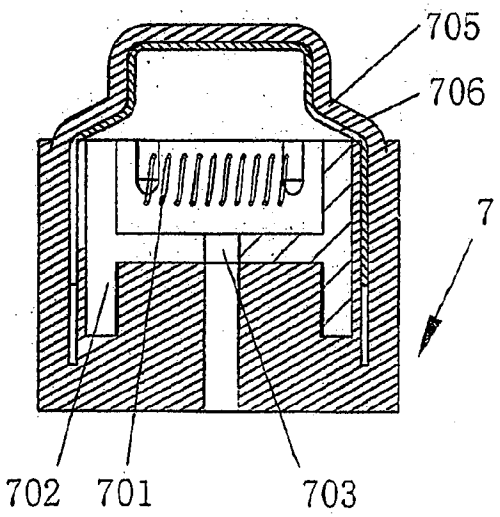

图3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2008/001563

A. CLASSIFICATION OF SUBJECT MATTER

See extra sheet

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)

IPC A61M 11 A61M 15 B05B 17 B05B 1

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)

CNPAT WPI EPODOC PAJ

inhaler?, sprayer?, atomi?er?, nebulizer?, pocket+, portabl+, compact+, heat+, porous+

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN201067728 Y (ZHU, Xiaochun et al), 04 Jun.2008 (04.06.2008), page 4 line 8 to page 7 line 9 in the specification, claims 1-8, figures 1-7.	1-5
X	CN2889333 Y (SHENZHEN JAUNTY SCIENCE & TECH), 18 Apr.2007 (18.04.2007), page 3 line 4 to page 6 line 9 in the specification, claims 1-8, figures 1-9.	1-5
A	JP2002321783 A (MITANI VALVE CO LTD), 05 Nov.2002 (05.11.2002), the whole document.	1-5
A	WO2007022898 A2 (BOEHRINGER INGELHEIM INT GMBH), 01 Mar.2007 (01.03.2007), the whole document.	1-5
A	US2005183718 A1 (BOEHRINGER INGELHEIM INT GMBH), 25 Aug.2005 (25.08.2005), the whole document.	1-5
A	US2005183719 A1 (BOEHRINGER INGELHEIM INT GMBH), 25 Aug.2005 (25.08.2005), the whole document.	1-5

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim (S) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
13.3 月 2009 (13.03.2009)	**26 Mar. 2009 (26.03.2009)**
Name and mailing address of the ISA/CN The State Intellectual Property Office, the P.R.China 6 Xitucheng Rd., Jimen Bridge, Haidian District, Beijing, China 100088 Facsimile No. 86-10-62019451	Authorized officer YAN,Tao Telephone No. (86-10)62085665

Form PCT/ISA/210 (second sheet) (April 2007)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2008/001563

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
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CN2889333 Y	18.04.2007	None	
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WO2007022898 A2	01.03.2007	US2007062518 A1	22.03.2007
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OPD - 2009-03-30
ICAI - A24F47/00
ICCI - A24F47/00
AP - CN20092106627U 20090330
PR - CN20092106627U 20090330
FAMN- 41522548
PD - 2010-01-13

AN - 2010-A98131 [12]
OPD - 2009-03-30
PD - 2010-01-13
AP - CN20092106627U 20090330
PA - (BEIJ-N) BEIJING GW TECHNOLOGIES CO LTD
CPY - BEIJ-N
IN - PAN G
TI - High-emulation electronic cigarette structure, has electric connectors ports of front-end casing of electronic atomizer and rear-end casing of electronic inhaler, where electric connectors are utilized to form complete electronic cigarette
AB - NOVELTY :
The structure has a cigarette-shaped casing equipped with a power source, an electronic atomizer and an electronic inhale, where the cigarette-shaped casing is provided with a front-end casing of the electronic atomizer and a rear-end casing of the electronic inhaler. An electric connector e.g. socket, is fixed at a port of the rear-end casing of the electronic inhaler. Another electric connector e.g. plug, is fixed at a port of the front-end casing of the electronic atomizer. The electric connectors are electrically connected to form a complete electronic cigarette.
- USE :
High-emulation electronic cigarette structure.
- DESCRIPTION OF DRAWINGS :
The drawing shows a sectional view of a high-emulation electronic cigarette structure.
PN - CN201379073Y Y 20100113 DW201012
NC - 1
IW - HIGH EMULATION ELECTRONIC CIGARETTE STRUCTURE ELECTRIC CONNECT PORT FRONT END CASING ATOMISE REAR INHALE UTILISE FORM COMPLETE
MC - B11-C04 B12-M01B
- V04-D01B V04-D03 V04-S09
DC - B07
- P15 P42
- V04
M6 - [01] M905 R150 R170 R440 R501 R528 R530

MC - A05-F01E A05-F01E3 A09-D03 A12-E07A A12-V03D
- S05-A V04-A05 V04-X01A

DC - A84
- P34 P42
- S05 V04

A01 - [001] 2004; ND01; Q9999 Q7454 Q7330; Q9999 Q8026 Q7987; J9999 J6611 J2915; N9999 N6611-R; ND05
- [002] 2004; P0635-R F70 D01
- [003] 2004; K9416

[19] 中华人民共和国国家知识产权局

[51] Int. Cl.
A24F 47/00 (2006.01)
B05B 17/00 (2006.01)

[12] 实用新型专利说明书

专利号 ZL 200920106627.X

[45] 授权公告日 2010 年 1 月 13 日

[11] 授权公告号 CN 201379073Y

[22] 申请日 2009.3.30
[21] 申请号 200920106627.X
[73] 专利权人 北京格林世界科技发展有限公司
地址 101300 北京市顺义区林河工业开发区顺仁路 54 号 2 号楼 3 层
[72] 发明人 潘国成

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代理人 孙皓晨 朱世定

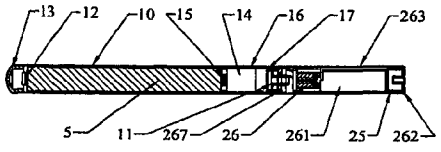
权利要求书 2 页 说明书 7 页 附图 3 页

[54] 实用新型名称

高仿真电子香烟的结构

[57] 摘要

本实用新型为一种高仿真电子香烟的结构，其包括：一香烟形外壳，在所述的外壳内至少设置有电源、电子雾化器以及电子吸入器，其中，所述的香烟形外壳由两部分组成，分别为电子雾化器前端外壳和电子吸入器后端外壳，其中，在所述的电子吸入器后端外壳端口处设置有一第一电连接件；所述的电子雾化器前端外壳端口处设有一第二电连接件，通过所述的第一电连接件和所述的第二电连接件电连接，形成一个完整的电子香烟。



1、一种高仿真电子香烟的结构，其包括：一香烟形外壳，在所述的外壳内至少设置有电源、电子雾化器以及电子吸入器，其特征在于，所述的香烟形外壳由两部分组成，分别为电子雾化器前端外壳和电子吸入器后端外壳，其中，在所述的电子吸入器后端外壳端口处设置有一第一电连接件；所述的电子雾化器前端外壳端口处设有一第二电连接件，通过所述的第一电连接件和所述的第二电连接件电连接，构成一完整的电子香烟。

2、根据权利要求 1 所述的高仿真电子香烟的结构，其特征在于，所述的第一电连接件为一插座，所述的第二电连接件为一插头，所述的插座与插头相插接，从而使所述的电子雾化器前端外壳和电子吸入器后端外壳连接成一整体。

3、根据权利要求 1 所述的高仿真电子香烟的结构，其特征在于，所述的第一电连接件为一下端子，其为一圆柱形接线端子，所述的下端子一部分外缘嵌入到所述的电子吸入器后端外壳内实现紧配合，外露的一部分外缘设有外螺纹；

所述的第二电连接件为一上端子，其为一圆柱形接线端子，所述的上端子与所述的电子雾化器前端外壳内壁紧配合，内部设有内螺纹；

所述的下端子与所述的上端子螺纹连接，从而使所述的电子雾化器前端外壳和电子吸入器后端连接成一整体。

4、根据权利要求 1 所述的高仿真电子香烟的结构，其特征在于，所述的第一电连接件为一插头，所述的第二电连接件为一插座，所述的插座与插头相插接，从而使所述的电子雾化器前端外壳和电子吸入器后端外壳连接成一整体。

5、根据权利要求 1 所述的高仿真电子香烟的结构，其特征在于，所述的第一电连接件为一下端子，其为一圆柱形接线端子，所述的下端子与所述的电子雾化器前端外壳下端内壁紧配合，所述的下端子内部设有内螺纹；

所述的第二电连接件为一上端子，其为一圆柱形接线端子，所述的上端子一部分外缘嵌入到所述的电子吸入器后端外壳内实现紧配合，外露的一部分外缘设有外螺纹；

所述的下端子与所述的上端子螺纹连接，从而使所述的电子雾化器前端外壳和电子吸入器后端连接成一整体。

6、根据权利要求 1-5 任一权利要求所述的高仿真电子香烟的结构，其特征在于，在所述的电子吸入器后端外壳内由前至后端依序装有烟帽、LED 指示灯、

所述的电源、装设有电子传感器和CPU处理器的电路板，所述的电源通过一电子开关与所述的第一电连接件相连。

7、根据权利要求6所述的高仿真电子香烟的结构，其特征在于，所述的电子雾化器前端外壳内部设置有所述电子雾化器，所述的第二电连接件和所述电子雾化器电连接。

8、根据权利要求7所述的高仿真电子香烟的结构，其特征在于，所述的电子雾化器包括：

雾化器壳体；

雾化器嵌件，其设置于所述的雾化器壳体内，所述的雾化器嵌件内部通过储液媒介吸附或储存将被雾化的烟液；

液体雾化组件，其与所述的第二电连接件电连接，所述的液体雾化组件内部设置有通气孔，用以通电加热产生雾化现象；

电子雾化器上盖，其嵌入所述的雾化器壳体上端，所述的电子雾化器上盖具有一通气孔，用以密封并防止烟液回流。

9、根据权利要求8所述的高仿真电子香烟的结构，其特征在于，还包括：一防漏件，所述的液体雾化组件设置于所述的防漏件内，且所述的防漏件与所述的雾化器壳体通过密封配合。

10、根据权利要求9所述的高仿真电子香烟的结构，其特征在于，所述的液体雾化组件包括：一发热件，所述的插头通过一插头座嵌入到所述的防漏件中，所述的插头座与所述的发热件电连接。

高仿真电子香烟的结构

技术领域

本实用新型涉及的是一种电子烟结构，特别是涉及一种具有保健功能的高仿真电子香烟的结构。

背景技术

香烟的有效成分是烟碱（即尼古丁），吸烟时，烟碱随着香烟燃烧时产生的大量焦油雾滴进入肺泡后迅速吸收作用于中枢神经系统的受体上，引起类似兴奋剂的"陶醉感"起到提神的作用。烟碱是小分子生物碱在血液中的半衰期极短，在小剂量下对人体基本无害。烟草的有害物质主要是焦油及烟草燃烧时产生的上千种有害成分其中有数十种成分是致癌物。香烟燃烧时产生的二手烟对人体危害更大。由于吸烟有害健康污染环境，随着科技发展，近年来许多减害的香烟替代产品应运而生。

例如日本专利文件特开平 3－232481 号公报，提出有一种在绝热管内设置加热组件和固体香味发生介质，通过把该绝热管和加热组件的电源用包装纸包装而形成香烟状的模拟烟具的提案。这种结构的模拟烟具，通过由电源把电能供给加热组件，使香味发生介质加热并生成香味成分，并通过吸入该香味成分和被吸入到模拟烟具内的空气的混合气，从而可达到满足香烟味道嗜好者的嗜好的效果。

然而，对于这种结构的模拟烟具，由于使香味发生介质升温要花时间，因而在香味发生介质生成足够量的香味成分之前需要等待一段时间，在模拟吸烟开始时得不到足够量的香味成分，模拟吸烟开始时得不到与吸真正的香烟相同的感觉。并且，由于不能对香味发生介质生成的香味成分的量进行高精度控制，因而不能根据吸入量来调整香味成分的量，得不到与吸真正的香烟相同的感觉。

而且，由于不具备发生与香烟相同的烟的功能和发生与香烟相同的火种的功能，因而总是觉得不像是在吸烟。

中国专利申请号为 03111582.9 的专利"一种非可燃性电子喷雾香烟"提供了

一种具有戒烟和香烟代用品作用的非可燃性电子喷雾香烟。该种香烟包括壳体、电池、高频发生器、烟碱贮液及容器、控制电路，显示屏、电子感应器、人体接触传感器、压电超声雾化器、高温气化喷管，此外还包括电控泵或连有计量腔的阀，单向注液阀等部件。此种电子香烟结构复杂，造价高，不利于推广使用。

中国专利 ZL200410048792.6 名称为“电子香烟”，公开了一种电子香烟，其具有：壳体，具有吸烟口，整体形状形成大致棒状；喷出装置，设置在上述壳体内，具有至少 1 个通过驱动致动器以改变充填有液态香味生成介质的腔内的压力，来把上述香味生成介质以液滴的状态从与上述腔连通的喷嘴的喷头喷出；以及控制装置，设置在上述壳体内，控制上述喷出装置的驱动；检测装置，用于检测上述壳体内流通的风量；以及烟发生装置，从上述壳体的前端部发生模拟烟；上述控制装置根据上述检测装置的检测结果控制上述烟发生装置的驱动。

这样，通过使用控制装置驱动喷出装置，把香味生成介质的液滴喷出到壳体内，并把香味成分供给到壳体内，其还包括：一雾化装置，设置在上述壳体内，使从上述喷出装置喷出的香味生成介质的液滴雾化。

这样，依靠喷出装置的驱动而喷出到壳体内的香味生成介质的液滴由雾化装置来雾化（细微化）。然后，通过在该状态下把壳体的吸烟口侧衔在口中吸气，使流入到壳体内的空气和壳体内的雾状香味成分的混合气流入到口内，香味成分在口内扩散，从而能够达到满足香烟味道嗜好者的嗜好的效果。

但是其仍有不足之处如下：

现有的电子烟烟液耗尽更换时过程繁琐，操做复杂；

现有的电子烟雾化装置结构复杂，易老化，不能更换，直接影响产品寿命；

现有的电子烟充电时需要取下烟杆内电池外接充电，且充电接口必须配套，造成使用不便等问题。

鉴于上述缺陷，本实用新型创作者经过长时间的研究和实践终于获得了本创作。

发明内容

本实用新型的目的在于，提供一种高仿真电子香烟的结构，用以克服上述缺陷。

为实现上述目的，本实用新型采用的技术方案在于，提供一种高仿真电子

香烟的结构，其包括：一香烟形外壳，在所述的外壳内至少设置有电源、电子雾化器以及电子吸入器，所述的香烟形外壳由两部分组成，分别为电子雾化器前端外壳和电子吸入器后端外壳，其中，在所述的电子吸入器后端外壳端口处设置有一第一电连接件；所述的电子雾化器前端外壳端口处设有一第二电连接件，通过所述的第一电连接件和所述的第二电连接件电连接，形成一个完整的电子香烟，其中所述的电源可以是充电电池或是一次性电池。

对于所述的第一电连接件和所述的第二电连接件存在两种主要的结构形式，其中第一种，所述的第一电连接件为一插座，所述的第二电连接件为一插头，所述的插座与插头相插接，从而使所述的电子雾化器前端外壳和电子吸入器后端外壳连接成一整体。

另一种，所述的第一电连接件为一下端子，其为一圆柱形接线端子，所述的下端子一部分外缘嵌入到所述的电子吸入器后端外壳内实现紧配合，外露的一部分外缘设有外螺纹；

所述的第二电连接件为一上端子，其为一圆柱形接线端子，所述的上端子与所述的电子雾化器前端外壳内壁紧配合，内部设有内螺纹；

所述的下端子与所述的上端子螺纹连接，从而所述的电子雾化器前端外壳和电子吸入器后端连接成一整体。

当然对于两种结合关系也存在互换的方式，即所述的第一电连接件为一插头，所述的第二电连接件为一插座，所述的插座与插头相插接，从而使所述的电子雾化器前端外壳和电子吸入器后端外壳连接成一整体。

所述的第一电连接件为一下端子，其为一圆柱形接线端子，所述的下端子与所述的电子雾化器前端外壳下端内壁紧配合，所述的下端子内部设有内螺纹；

所述的第二电连接件为一上端子，其为一圆柱形接线端子，所述的上端子一部分外缘嵌入到所述的电子吸入器后端外壳内实现紧配合，外露的一部分外缘设有外螺纹；

所述的下端子与所述的上端子螺纹连接，从而使所述的电子雾化器前端外壳和电子吸入器后端连接成一整体。

其中，在所述的电子吸入器后端外壳内由前至后端依序装有烟帽、LED 指示灯、所述的电源、装设有一电子传感器和 CPU 处理器的电路板，所述的电源通过一电子开关与所述的第一电连接件相连。

所述的电子雾化器前端外壳内部设置有所述电子雾化器，其中，所述的第

二电连接件和所述电子雾化器电连接。

其中，所述的电子雾化器包括：

雾化器壳体；

雾化器嵌件，其设置于所述的雾化器壳体内，所述的雾化器嵌件内部通过储液媒介吸附或储存将被雾化的烟液；

液体雾化组件，其与所述的第二电连接件电连接，所述的液体雾化组件内部设置有通气孔，用以通电加热产生雾化现象；

电子雾化器上盖，其嵌入所述的雾化器壳体上端，所述的电子雾化器上盖具有一通气孔，用以密封并防止烟液回流。

较佳的，还包括：一防漏件，所述的液体雾化组件设置于所述的防漏件内，且所述的防漏件与所述的雾化器壳体通过密封配合。

其中，所述的液体雾化组件包括：一发热件，所述的插头通过一插头座嵌入到所述的防漏件中，所述的插头座与所述的发热件电连接。

与现有技术比较本实用新型的有益效果在于，简化了现有电子烟复杂的机械原理和繁琐的装配过程，克服了不安全、易老化的雾化装置缺陷。

同时将电子烟雾化装置部分和电子吸入器控制电路部分进行分体设计。将储存烟液的容器和雾化烟液的雾化装置及通电电路一起装入电子雾化器中密封形成一体，防止了烟液的渗漏、回流及外露。当烟液耗尽后将一体式电子雾化器丢弃，更换新的一只即可重新使用从根本上解决了电子烟雾化装置老化的核心问题，延长了电子烟使用寿命。

采用标准直流插头插入到插座中直接充电或将带有螺纹连接的电子雾化吸入器后端杆体产品拧入相应充电器充电，从而简化了充电过程。

附图说明

图 1 为本实用新型高仿真电子香烟的结构实施例一的电子雾化器前端结构剖视简图；

图 2 为本实用新型高仿真电子香烟的结构实施例一电子雾化器的剖视图；

图 3 为本实用新型高仿真电子香烟的结构实施例一的安装后的结构剖视简图；

图 4 为本实用新型高仿真电子香烟的结构实施例二的电子吸入器后端结构剖视简图；

图 5 为本实用新型高仿真电子香烟的结构的防漏件与发热支撑件结合后的结构剖视简图；

图 6 为本实用新型高仿真电子香烟的结构实施例二的安装后的结构剖视简图。

具体实施方式

以下结合附图，对本新型上述的和另外的技术特征和优点作更详细的说明。

本实用新型高仿真电子香烟的结构的发明目的在于，将分离的烟体结构快速便捷的结合成一个整体，同时简化了充电过程。在具体实施方式中我们描述两种结构，但并非是对本实用新型保护范围的限定。

所述的高仿真电子香烟的结构包括：一香烟形外壳，在所述的外壳内至少设置有电源、电子雾化器以及电子吸入器，所述的香烟形外壳由两部分组成，分别为电子雾化器前端外壳和电子吸入器后端外壳，即分别对应着高仿真电子香烟的电子雾化器前端部分和电子吸入器后端部分，其中，在所述的电子吸入器后端外壳端口处设置有一第一电连接件；所述的电子雾化器前端外壳端口处设有一第二电连接件，通过所述的第一电连接件和所述的第二电连接件电连接，形成一个完整的电子香烟。

请参阅图 1 所示，其为本实用新型高仿真电子香烟的结构实施例一的电子雾化器前端结构剖视简图；在所述的电子雾化器前端外壳 10 内由前至后端依序装有烟帽 13、LED 指示灯 12、所述的电源 5、装设有电子传感器 6 和 CPU 处理器 3 的电路板 14 以及所述的第一电连接件 11，所述的电源 5 通过一电子开关与所述的第一电连接件 11 相连，所述的电子传感器 6 装设在一感应器支架 61 上，所述的第一电连接件为一下端子 11，其为一圆柱形接线端子，所述的下端子 11 一部分外缘嵌入到所述的电子雾化器前端外壳 10 内实现紧配合，外露的一部分外缘设有外螺纹 17，用以和一具有内螺纹的结构结合在一起，实现整体的连接。

请参阅图 2 所示，其为本实用新型高仿真电子香烟的结构实施例一电子雾化器的剖视图；所述的电子雾化器包括：雾化器壳体 263；所述的雾化器壳体 263 内包括：雾化器嵌件 261，其设置于所述的雾化器壳体 263 内，所述的雾化器嵌件 261 内部通过储液媒介 264 吸附或储存将被雾化的烟液；所述的储液媒介 264 对应材料的耐热温度为 100 度至 3000 度，其材料可以为纤维棉或其它组

合，从而在所述的电子雾化器工作状态下，产生热量不至于将所述的储液媒介破坏。

液体雾化组件，用以通电后产生热量，从而作为产生雾化现象的热源，其通过导线 266 与所述的第二电连接件 267 电连接，其中，所述的液体雾化组件包括：一发热件 265，用以产生热量，其为耐高温材料即可以是钨丝；一热量均匀件 268，用以将发热件 265 的热量均匀化，所述的发热件 265 设置于所述的热量均匀件 268 内，所述的热量均匀件 268 为 100 度至 3000 度耐高温材料制成，其可以是罐装体也可以是圆柱体或其它，这里采用罐装体。还包括：一发热件支撑件 269，套设在所述的钨丝内，其用以起到支撑，与所述的热量均匀件 268 相固定作用，所述的发热件支撑件 269 是由 100 度至 3000 度耐高温有机材料或无机材料制成，这里采用高温丝，在所述的罐装体发热支撑件中间设置有通气孔。

电子雾化器上盖 262，其嵌入所述的雾化器壳体 263 上端，所述的电子雾化器上盖 262 具有一通气孔，用以密封并防止烟液回流。

所述的第二电连接件为一上端子 267，其为一圆柱形接线端子，所述的上端子与所述的电子吸入器后端外壳 263 下端内壁紧配合，所述的上端子 267 内部设有内螺纹；

所述的下端子 267 与所述的上端子 11 螺纹连接，同时所述的电子雾化器前端和电子吸入器后端连接成一整体。

这里需要强调的是由于采用了螺纹连接形式，因此在结合关系上对应的客体可以对调，位于所述的电子雾化器前端第一电连接件为一上端子，其与所述的电子雾化器前端外壳下端内壁紧配合，所述的上端子内部设有内螺纹；

位于所述的电子吸入器后端第二电连接件为一下端子，其一部分外缘嵌入到所述的电子吸入器后端外壳内实现紧配合，外露的一部分外缘设有外螺纹；

所述的下端子与所述的上端子螺纹连接，同时所述的电子雾化器前端和电子吸入器后端连接成一整体。

请参阅图 3 所示，其为本实用新型高仿真电子香烟的结构实施例一的安装后的结构剖视简图；通过所述的上端子 11 内部设有内螺纹与所述下端子 267 外露的设有外螺纹相结合，从而实现所述的电子雾化器前端外壳和电子吸入器后端外壳之间结构的整体结合，内部实现电连接，最终形成一个完整的整体。

请参阅图 4 所示，其为本实用新型高仿真电子香烟的结构实施例二的电子

吸入器后端结构剖视简图；其在所述的电子吸入器后端外壳内依次设置有防漏件 23、液体雾化组件，其中所述的防漏件 23 为导电材料制得，所述的电子吸入器后端外壳顶端设置有烟嘴，其中一直流插头 21 通过一插头座 24 与所述的防漏件 23 相结合，从而形成所述液体雾化组件中的发热件 265 电连接。

请参阅图 5 所示，其为本实用新型高仿真电子香烟的结构防漏件与发热支撑件结合后的结构剖视简图；所述的防漏件 23 为一圆柱形两端开设有直径不同的罐状结构，并且其中央具有一个承载座，所述的液体雾化组件的热量均匀件 268 设置于所述的防漏件 23 内并抵靠在承载座上，所述的防漏件 23 前端中空部用以和直流插头座 24 相连接；壳体内部的器件与壳体之间要设置密封件进行密封处理，这对本领域技术人员而言是显然的，这里就不再赘述了。

请参阅图 6 所示，其为本实用新型高仿真电子香烟的结构实施例二的安装后的结构剖视简图；所述的电子雾化器前端外壳依次设置有烟帽 13、电源 10、电路板 14 以及一个直流插头 21，一插头座 24 嵌入到所述的防漏件 23 中，所述的插头座 24 与所述的发热件 265 电连接；所述的插座 28 与直流插头 21 相插接，同时所述的电子雾化器前端外壳和电子吸入器后端外壳连接成一整体。

需要强调的是这种结合关系对应的客体是可以对调的，位于所述的电子雾化器前端的第一电连接件可以为一直流插头 21，位于所述的电子吸入器后端的第二电连接件可以为一插座 28，其中，所述的插座 28 嵌入到所述的防漏件 23 中，并与所述的发热件 265 电连接；所述的插座 28 与直流插头 21 相插接，同时所述的电子雾化器前端外壳和电子吸入器后端外壳连接成一整体。

本实用新型简化了现有电子烟复杂的机械原理和繁琐的装配过程。

同时将电子烟雾化装置部分和电子吸入器控制电路部分进行分体设计。将储存烟液的容器和雾化烟液的雾化装置及通电电路一起装入电子雾化器中密封形成一体，防止了烟液的渗漏、回流及外露。当烟液耗尽后将一体式电子雾化器丢弃，更换新的一只即可重新使用从根本上解决了电子烟雾化装置老化的核心问题，延长了电子烟使用寿命。

采用标准直流插头插入到插座中直接充电或将带有螺纹连接的电子雾化吸入器后端杆体产品拧入相应充电器充电，从而简化了充电过程。

以上说明对本新型而言只是说明性的，而非限制性的，本领域普通技术人员理解，在不脱离以下所附权利要求所限定的精神和范围的情况下，可做出许多修改，变化，或等效，但都将落入本实用新型的保护范围内。

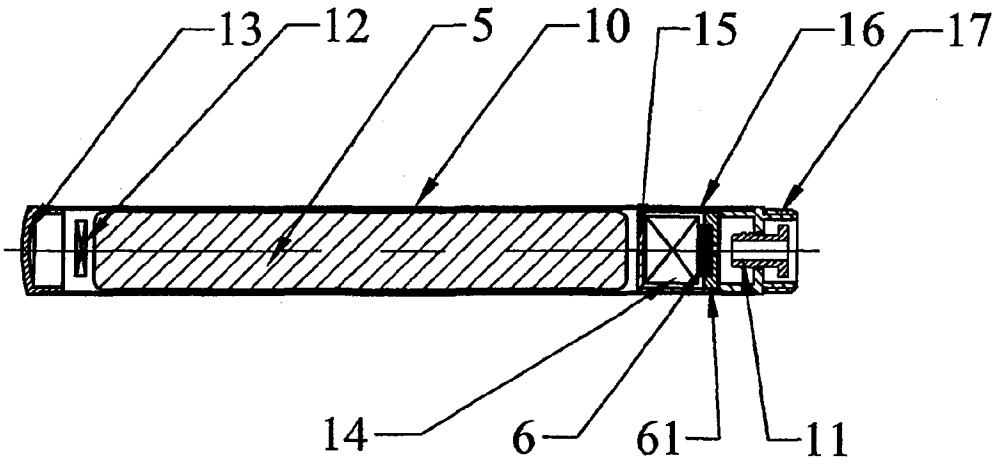


图 1

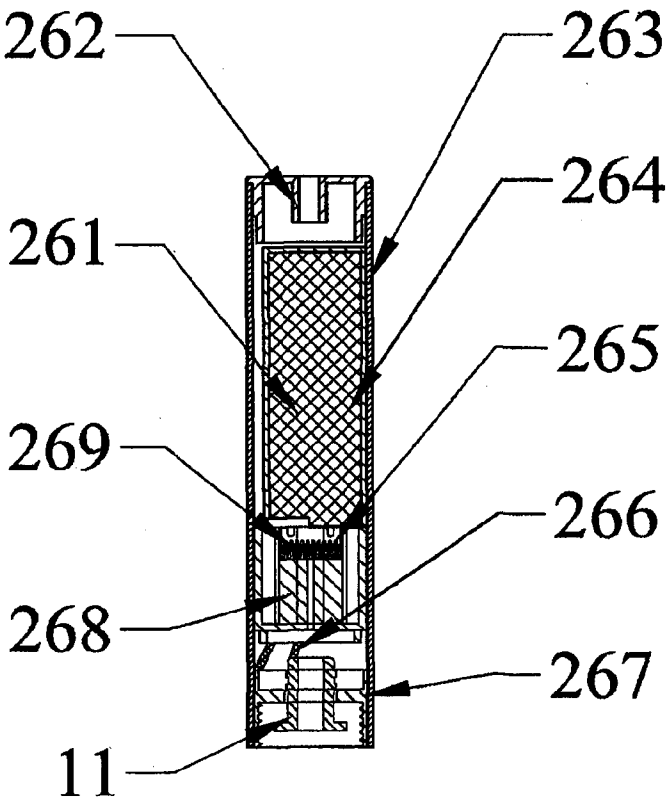


图 2

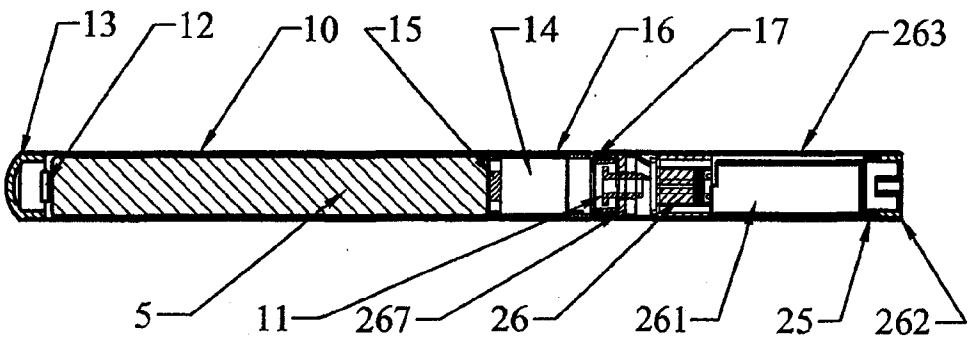


图 3

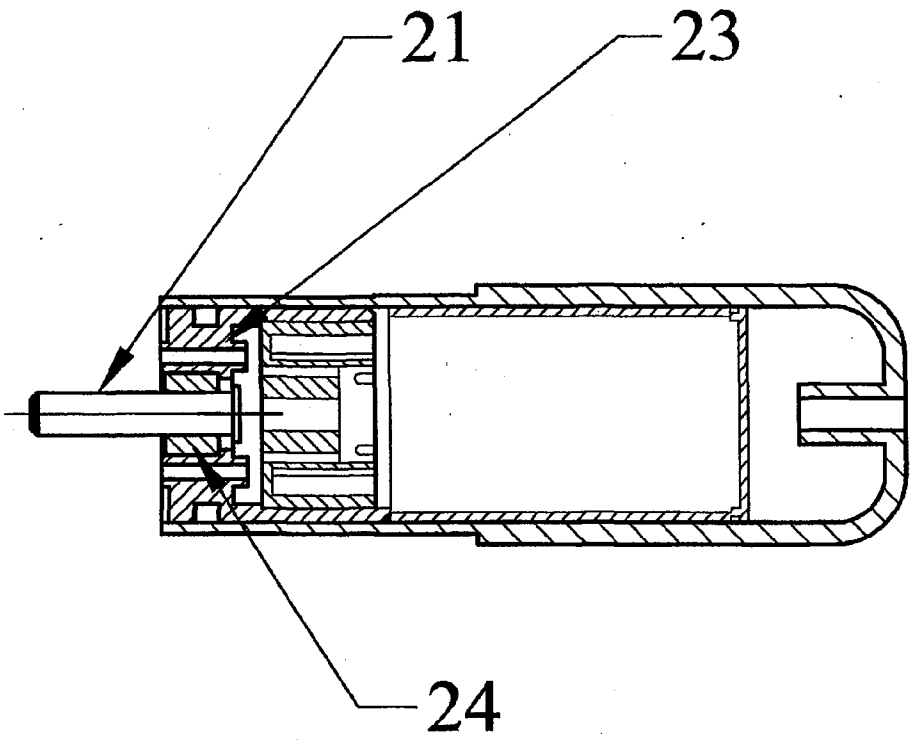


图 4

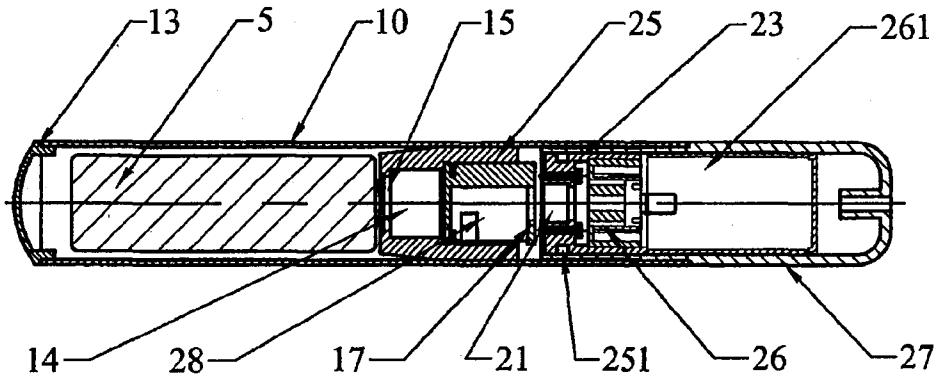


图 5

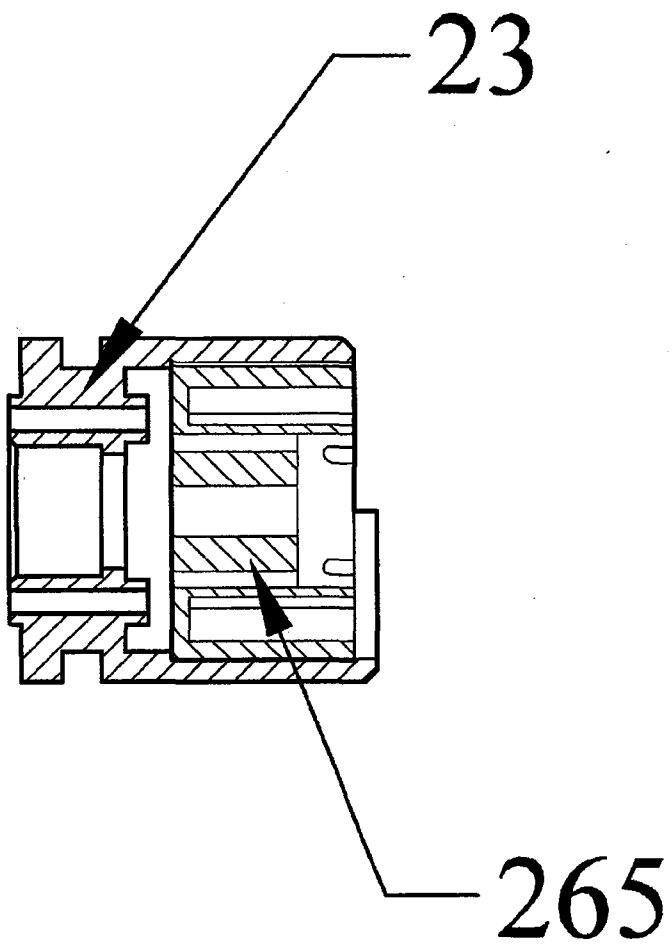


图 6

PN - CN201238610Y Y 20090520
OPD - 2008-08-19
PA - HAORAN XIA [CN]
IN - HAORAN XIA [CN]
TI - Environmental-protecting type non-ignitability atomizing electronic cigarette with function of cigarette substitute article
AB - The utility model discloses an environment-friendly incombustible atomizing electronic cigarette with the function of a cigarette substitute, which relates to a cigarette substitute and comprises a detachable controller and a generator; the inner part of the controller is provided with an indicating lamp cover, a signal indicating lamp, a chargeable lithium battery, an integrated circuit board, an electret microphone and a hollow connecting conductor B in sequence; the inner part of the generator is provided with a connecting conductor A, a vibrating diaphragm, a liquid-blocking plate, a secondary liquid storage chamber, a heater, a liquid-guiding mechanism, a liquid storage chamber and a soft suction nozzle in sequence; the connecting conductor A is provided with an air inlet; a gap which is used as a gas channel is left between the soft nozzle and the liquid storage chamber; and a space which is needed by the electret microphone is left between the electret microphone and the connector conductor B. The utility model has similar shape with the cigarette, is small, easy to carry, simple in structure and low in cost, meets the using habits of smokers, does not have noxious substances of tar and carbon monoxide, and the like, reduces the cancerogenic risk, and does not have fire hazard; in addition, the aspirated smoke does not cause environmental pollution.
ICAI - A24F47/00; B05B17/04; G05B19/04; H04R19/01; H04R19/04
ICCI - A24F47/00; B05B17/04; G05B19/04; H04R19/00
AP - CN20082132275U 20080819
PR - CN20082132275U 20080819
FAMN - 40711895
PD - 2009-05-20

AN - 2009-J84138 [36]
OPD - 2008-08-19
PD - 2009-05-20
AP - CN20082132275U 20080819; KR20090009566U 20090722
PA - (HAUY-I) HAUYAN S
- (SHIN-I) SHIN H
- (XIAH-I) XIA H
CPY - HAUY-I; SHIN-I; XIAH-I
IN - HAUYAN S; XIA H
TI - Environment friendly non-flammable atomization electronic cigarette, has hollow bonding connector provided with air inlet, and gap formed between electret microphone and another hollow bonding conductor to operate electret microphone
AB - NOVELTY :
The cigarette has a hollow bonding connector (5), a vibrating diaphragm (7), a fluid resistant piece (8), a secondary fluid storage compartment (10), a heater (9), a fluid guide mechanism (11), a fluid storage compartment (12) and a soft suction nozzle (13) set in a generator from left to right. The hollow bonding connector is provided with an air inlet. A gap is formed between the soft suction nozzle and the fluid storage compartment to provide a way for air flow. Another gap is formed between an electret microphone and a hollow bonding conductor (6) to operate the electret microphone.
- USE :
Environment friendly non-flammable atomization electronic cigarette.
- ADVANTAGE :
The cigarette is simple in structure and inexpensive. The cigarette does not contain harmful materials such as tar and carbon monoxide, thus reducing the risk of cancer and avoiding the fire hazard. The cigarette does not pollute the environment.

- DESCRIPTION OF DRAWINGS :

The drawing shows a sectional view of an environment friendly non-flammable atomization electronic cigarette.

5, 6 : Hollow bonding connectors

7 : Vibrating diaphragm

8 : Fluid resistant piece

9 : Heater

10 : Secondary fluid storage compartment

11 : Fluid guide mechanism

12 : Fluid storage compartment

13 : Soft suction nozzle

PN - CN201238610Y Y 20090520 DW200936
KR20100002123U U 20100302 DW201020
NC - 2
IW - ENVIRONMENT FRIEND NON FLAMMABLE ATOMISE ELECTRONIC CIGARETTE HOLLOW BOND CONNECT AIR INLET GAP FORMING ELECTRET MICROPHONE CONDUCTOR OPERATE
MC - T06-A04B T06-D02 T06-D04 V06-V01C V06-V04A2
DC - P15 P42
- T06 V06

[19] 中华人民共和国国家知识产权局

[12] 实用新型专利说明书

专利号 ZL 200820132275.0

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A24F 47/00 (2006.01)
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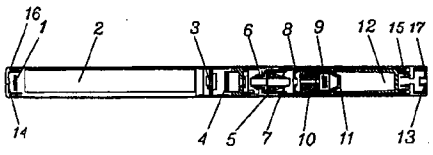
[54] 实用新型名称

一种具有香烟代用品作用的环保型非可燃性雾化电子香烟

[57] 摘要

一种具有香烟代用品作用的环保型非可燃性雾化电子香烟，涉及香烟代用品，包括可拆合的控制器和发生器，控制器内部依次设有指示灯盖、信号指示灯、可充电锂电池、集成线路板、驻极体传声器、中空的连接导体 B；发生器内部依次设有中空的连接导体 A、振动膜片、阻液片、次级贮液室、加热器、导液机构、贮液室、软性吸嘴；连接导体 A 设有进气孔，软性吸嘴与贮液室之间留有作为气流通道的间隙，驻极体传声器与连接导体 B 之间留有驻极体传声器工作所需的空间。 本实用新型外形和香烟类似，小巧易携带，结构简单，成本低廉，符合吸烟者的使用习惯，没有焦油、一氧化碳等有害物，降低了致癌风险，无火灾隐患，其吸出的烟雾无环境污染。



1．一种具有香烟代用品作用的环保型非可燃性雾化电子香烟，包括可拆合的控制器和发生器，其特征在于：所说的控制器内部从左到右依次设有指示灯盖（14）、信号指示灯（1）、可充电锂电池（2）、集成线路板（3）、驻极体传声器（4）、中空的连接导体B（6）；所说的发生器内部从左到右依次设有中空的连接导体A(5)、振动膜片(7)、阻液片（8）、次级贮液室（10）、加热器（9）、导液机构（11）、贮液室（12）、软性吸嘴（13）；连接导体 A（5）设有进气孔（702），软性吸嘴（13）与贮液室（12）之间留有作为气流通道的间隙，驻极体传声器（4）与连接导体B（6）之间留有驻极体传声器工作所需的空间。

2．如权利要求 1 所述的具有香烟代用品作用的环保型非可燃性雾化电子香烟，其特征在于：连接导体 B（6）和连接导体 A（5）上设有相互适配的螺纹或卡槽。

3．如权利要求 2 所述的具有香烟代用品作用的环保型非可燃性雾化电子香烟，其特征在于：连接导体 B（6）和连接导体 A（5）间通过中空的接触铜帽螺纹连接或卡槽连接。

4．如权利要求 1 或 2 或 3 所述的具有香烟代用品作用的环保型非可燃性雾化电子香烟，其特征在于：控制器与发生器外表面均设有不锈钢外壳，软性吸嘴（13）内设有阻液槽（15），软性吸嘴（13）外端面上设有阻液封盖（17），控制器底端或指示灯盖（14）上设有通气孔（16）。

5．如权利要求 4 所述的具有香烟代用品作用的环保型非可燃性雾化电子香烟，其特征在于：发生器的不锈钢外壳内还设有隔热层。

6．如权利要求 1 或 2 或 3 所述的具有香烟代用品作用的环保型非可燃性雾化电子香烟，其特征在于：集成线路板（3）包括控制器 IC1，控制器 IC1 的第 1 引脚分别和电容 C1 的一端、电阻 R7 的一端、电阻 R1 的一端、三极管 Q1 的集电极连接，电阻 R7 的另一端和 VCC

端子连接，三极管 Q1 的发射极分别和电阻 R5 的一端、控制器 IC1 的第 4 引脚连接，电阻 R1 的另一端分别和三极管 Q1 的基极、电阻 R2 的一端连接，电阻 R2 的另一端分别和 K 端子、电阻 R4 的一端连接，电阻 R4 的另一端和电阻 R5 的另一端、GND 端子、HEATER-端子连接，控制器 IC1 的第 2 引脚和电阻 R3 的一端连接，电阻 R3 的另一端和 K 端子连接，控制器 IC1 的第 3 引脚分别和 HEATER+端子、电阻 R6 的一端连接，电阻 R6 的另一端和 GND 端子连接，控制器 IC1 的第 5 引脚通过 LE 端子和 LED 灯 D1 的正极连接，LED 灯 D1 的负极和电阻 R8 的一端连接，电阻 R8 的另一端和 GND 端子连接，控制器 IC1 的第 6 引脚和 MOS FET Q2 的栅极连接，MOS FET Q2 的源极和 HEATER+端子连接、漏极和电源 VCC 连接，IC 芯片的第 7 引脚和 S 端子连接，控制器 IC1 的第 8 引脚分别和电容 C1 的另一端、GND 端子连接，HEATER-端子和加热器 HEATER 负极连接，HEATER+端子和加热器 HEATER 正极连接，开关 S1 连接在 K 端子和 S 端子之间。

7．如权利要求 4 所述的具有香烟代用品作用的环保型非可燃性雾化电子香烟，其特征在于：集成线路板（3）包括控制器 IC1，控制器 IC1 的第 1 引脚分别和电容 C1 的一端、电阻 R7 的一端、电阻 R1 的一端、三极管 Q1 的集电极连接，电阻 R7 的另一端和 VCC 端子连接，三极管 Q1 的发射极分别和电阻 R5 的一端、控制器 IC1 的第 4 引脚连接，电阻 R1 的另一端分别和三极管 Q1 的基极、电阻 R2 的一端连接，电阻 R2 的另一端分别和 K 端子、电阻 R4 的一端连接，电阻 R4 的另一端和电阻 R5 的另一端、GND 端子、HEATER-端子连接，控制器 IC1 的第 2 引脚和电阻 R3 的一端连接，电阻 R3 的另一端和 K 端子连接，控制器 IC1 的第 3 引脚分别和 HEATER+端子、电阻 R6 的一端连接，电阻 R6 的另一端和 GND 端子连接，控制器 IC1 的第 5 引脚通过 LE 端子和 LED 灯 D1 的正极连接，LED 灯 D1 的负极和电阻 R8 的一端连接，电阻 R8 的另一端和 GND 端子连接，控制器 IC1 的第 6 引脚和 MOS FET Q2 的栅极连接，MOS FET Q2 的源极和 HEATER+端子连接、漏极和电源 VCC 连接，IC 芯片的第 7 引脚和 S 端子连接，控制器 IC1

的第 8 引脚分别和电容 C1 的另一端、GND 端子连接，HEATER-端子和加热器 HEATER 负极连接，HEATER+端子和加热器 HEATER 正极连接，开关 S1 连接在 K 端子和 S 端子之间。

8. 如权利要求 5 所述的具有香烟代用品作用的环保型非可燃性雾化电子香烟，其特征在于：集成线路板（3）包括控制器 IC1，控制器 IC1 的第 1 引脚分别和电容 C1 的一端、电阻 R7 的一端、电阻 R1 的一端、三极管 Q1 的集电极连接，电阻 R7 的另一端和 VCC 端子连接，三极管 Q1 的发射极分别和电阻 R5 的一端、控制器 IC1 的第 4 引脚连接，电阻 R1 的另一端分别和三极管 Q1 的基极、电阻 R2 的一端连接，电阻 R2 的另一端分别和 K 端子、电阻 R4 的一端连接，电阻 R4 的另一端和电阻 R5 的另一端、GND 端子、HEATER-端子连接，控制器 IC1 的第 2 引脚和电阻 R3 的一端连接，电阻 R3 的另一端和 K 端子连接，控制器 IC1 的第 3 引脚分别和 HEATER+端子、电阻 R6 的一端连接，电阻 R6 的另一端和 GND 端子连接，控制器 IC1 的第 5 引脚通过 LE 端子和 LED 灯 D1 的正极连接，LED 灯 D1 的负极和电阻 R8 的一端连接，电阻 R8 的另一端和 GND 端子连接，控制器 IC1 的第 6 引脚和 MOS FET Q2 的栅极连接，MOS FET Q2 的源极和 HEATER+端子连接、漏极和电源 VCC 连接，IC 芯片的第 7 引脚和 S 端子连接，控制器 IC1 的第 8 引脚分别和电容 C1 的另一端、GND 端子连接，HEATER-端子和加热器 HEATER 负极连接，HEATER+端子和加热器 HEATER 正极连接，开关 S1 连接在 K 端子和 S 端子之间。

一种具有香烟代用品作用的环保型非可燃性雾化电子香烟

技术领域

本实用新型涉及香烟代用品，具体的说是一种具有香烟代用品作用的环保型非可燃性雾化电子香烟。

背景技术

当今“吸烟有害健康”，已成为人所共知的常识，全世界仍然有10 亿以上的烟民，美国环境保护署目前将空气中的烟草雾宣布为 A 级致癌物。据世界卫生组织等部门公布的数字，全球每年约有 490 万人死于与吸烟有关的疾病；但是由于种种原因，要吸烟者完全戒烟是一件极其困难的事。烟草中的尼古丁是一种化学物质，它能使人吸烟成瘾又难以戒掉。美国医学会的有关专家指出，尼古丁是致人成瘾的最强有力的物质之一。研究机构已进一步明确了尼古丁如何通过人脑起作用而使烟民们成瘾。吸烟时烟碱随着香烟燃烧时产生的大量焦油雾滴进入肺泡后被迅速吸收，引起类似兴奋剂的“陶醉感”，如吸烟者所经历的头晕目眩或飘飘然的感觉。烟碱是小分子生物碱，在小剂量下对人体基本无害，而且在血液中的半衰期极短。但烟草中还含有其它的有害物质，如：烟焦油，一氧化碳，苯并芘，多环芳烃，亚硝胺、偶氮杂质等都是强致癌物，这对人类的生存和健康造成了巨大的危害。

为了寻找即能满足吸烟者的烟瘾需求，而又将烟草的危害降到最低，又不改变人们的使用习惯，许多戒烟产品都是将低剂量的烟碱做成诸如：“戒烟贴”、“烟碱漱口水”、“烟碱口香糖”等产品，虽然这些产品一定程度上解决了吸烟者成瘾的问题，但是由于这些产品与吸烟者的使用习惯格格不入，所以很难为吸烟者接受。也有一些戒烟产品将烟碱溶液经过机械装置加热供吸烟者使用，虽然吸烟者在使用习

惯上易于接受，但由于传统的机械结构性能不稳定，极易损坏，操作繁琐，容易给吸烟者造成损失。为了尽可能不改变吸烟者的习惯，也有人尝试在香烟的基础上增加活性碳过滤器、液体过滤等过滤装置，以期在一定程度上减少香烟对人体的危害；还有些人试图通过大型的机器设备做成类似吸氧机之类的设备，这虽然在一定程度上解决了吸烟者的需求，但是设备庞大，造价高昂，很多还需要专门的场地，很难使吸烟者接受，而且戒烟效果均不理想。

实用新型内容

针对现有技术中存在的缺陷，本实用新型的目的在于提供一种具有香烟代用品作用的环保型非可燃性雾化电子香烟，外形和香烟类似，小巧易携带，结构简单，成本低廉，符合吸烟者的使用习惯，没有焦油、一氧化碳等有害物，降低了致癌风险，无需点燃避免了火灾隐患，其吸出的烟雾无环境污染。

为达到以上目的，本实用新型采取的技术方案是：

一种具有香烟代用品作用的环保型非可燃性雾化电子香烟，包括可拆合的控制器和发生器，其特征在于：所说的控制器内部从左到右依次设有指示灯盖 14、信号指示灯 1、可充电锂电池 2、集成线路板 3、驻极体传声器 4、中空的连接导体 B6；所说的发生器内部从左到右依次设有中空的连接导体 A5、振动膜片 7、阻液片 8、次级贮液室 10、加热器 9、导液机构 11、贮液室 12、软性吸嘴 13；连接导体 A5 设有进气孔 702，软性吸嘴 13 与贮液室 12 之间留有作为气流通道的间隙，驻极体传声器 4 与连接导体 B6 之间留有驻极体传声器工作所需的空间。

在上述技术方案的基础上，连接导体 B6 和连接导体 A5 上设有相互适配的螺纹或卡槽。

在上述技术方案的基础上，连接导体 B6 和连接导体 A5 间通过中空的接触铜帽螺纹连接或卡槽连接。

在上述技术方案的基础上，控制器与发生器外表面均设有不锈钢外壳，软性吸嘴 13 内设有阻液槽 15，软性吸嘴 13 外端面上设有阻液封盖 17，控制器底端或指示灯盖 14 上设有通气孔 16。

在上述技术方案的基础上，发生器的不锈钢外壳内还设有隔热层。

在上述技术方案的基础上，集成线路板 3 包括控制器 IC1，控制器 IC1 的第 1 引脚分别和电容 C1 的一端、电阻 R7 的一端、电阻 R1 的一端、三极管 Q1 的集电极连接，电阻 R7 的另一端和 VCC 端子连接，三极管 Q1 的发射极分别和电阻 R5 的一端、控制器 IC1 的第 4 引脚连接，电阻 R1 的另一端分别和三极管 Q1 的基极、电阻 R2 的一端连接，电阻 R2 的另一端分别和 K 端子、电阻 R4 的一端连接，电阻 R4 的另一端和电阻 R5 的另一端、GND 端子、HEATER-端子连接，控制器 IC1 的第 2 引脚和电阻 R3 的一端连接，电阻 R3 的另一端和 K 端子连接，控制器 IC1 的第 3 引脚分别和 HEATER+端子、电阻 R6 的一端连接，电阻 R6 的另一端和 GND 端子连接，控制器 IC1 的第 5 引脚通过 LE 端子和 LED 灯 D1 的正极连接，LED 灯 D1 的负极和电阻 R8 的一端连接，电阻 R8 的另一端和 GND 端子连接，控制器 IC1 的第 6 引脚和 MOS FET Q2 的栅极连接，MOS FET Q2 的源极和 HEATER+端子连接、漏极和电源 VCC 连接，IC 芯片的第 7 引脚和 S 端子连接，控制器 IC1 的第 8 引脚分别和电容 C1 的另一端、GND 端子连接，HEATER-端子和加热器 HEATER 负极连接，HEATER+端子和加热器 HEATER 正极连接，开关 S1 连接在 K 端子和 S 端子之间。

本实用新型所述的具有香烟代用品作用的环保型非可燃性雾化电子香烟的外形和香烟类似，小巧易携带，结构简单，成本低廉，符合吸烟者的使用习惯，没有焦油、一氧化碳等有害物，降低了致癌风险，无需点燃避免了火灾隐患，其吸出的烟雾无环境污染。

附图说明

本实用新型有如下附图：

图1 具有香烟代用品作用的环保型非可燃性雾化电子香烟的结构示意图

图2 具有香烟代用品作用的环保型非可燃性雾化电子香烟的拆合结构示意图

图3 连接导体A、连接导体B及振动膜片的结构示意图

图4 阻液片、次级贮液室、加热器及导液机构的结构示意图

图5 吸嘴部份气流循环及软性吸嘴的结构示意图

图6 集成线路板的电路原理示意图

附图标记：

1为信号指示灯，2为可充电锂电池，3为集成线路板，4为驻极体传声器，5为连接导体A，6为连接导体B，7为振动膜片，8为阻液片，9为加热器，10为次级贮液室，11为导液机构，12为贮液室，13为软性吸嘴，14为指示灯盖，15为阻液槽，16为通气孔，17为阻液封盖。

具体实施方式

以下结合附图对本实用新型作进一步详细说明。

图 1 为具有香烟代用品作用的环保型非可燃性雾化电子香烟的结构示意图，图2为具有香烟代用品作用的环保型非可燃性雾化电子香烟的拆合结构示意图，包括可拆合的控制器和发生器，其特征在于：所说的控制器内部从左到右依次设有指示灯盖14、信号指示灯1、可充电锂电池2、集成线路板3、驻极体传声器4、中空的连接导体B6；所说的发生器内部从左到右依次设有中空的连接导体 A5、振动膜片7、阻液片8、次级贮液室10、加热器9、导液机构11、贮液室12、软性吸嘴13；连接导体A5设有进气孔702（参见图3），软性吸嘴13与贮液室12之间留有作为气流通道的间隙（参见图5），驻极体传声

器 4 与连接导体 B6 之间留有驻极体传声器工作所需的空间。如图 1 所示，驻极体传声器 4 将控制器分成两个独立的空间，左侧空间内是指示灯盖 14、信号指示灯 1 和可充电锂电池 2，右侧空间内是驻极体传声器 4 和连接导体 B6，所说的“驻极体传声器 4 将控制器分成两个独立的空间”的具体实施方式可以采用现有技术实现，优选在驻极体传声器 4 周圈用软性塑胶密封其和控制器外壳间的缝隙。如图 1、图 2 所示，可充电锂电池 2 是内置的，将可拆合的控制器和发生器拆开后，控制器的连接导体 B6 如果连入充电器，即可通过集成线路板 3 实现对可充电锂电池 2 的充电，连接导体 B6 如果通过连接导体 A5 与发生器连接后可组成一具有香烟代用品作用的环保型非可燃性雾化电子香烟。信号指示灯 1 可以随着吸烟者的每一次吸烟模拟烟头的亮灭效果，信号指示灯 1 通过集成线路板 3 获得可充电锂电池 2 的供电。加热器 9 通过连接导体 A5、连接导体 B6、集成线路板 3 获得可充电锂电池 2 的供电。本实用新型的工作过程如下：在使用时，药液由贮液室 12 通过导液机构 11 流入次级贮液室 10，导液机构 11 内包裹有加热器 9（参见图 4），在吸烟者抽吸的作用下，气流由发生器侧面的进气孔 702 进入发生器内，在气流作用下振动膜片 7 产生振动，驻极体传声器 4 因此也发出振动，经集成线路板上的控制器 IC1（参见图 6）转为开关信号后，加热器 9 开始工作，加热器 9 的雾化工作室内瞬间将药液气化，气化的药液由吸烟者从软性吸嘴 13 吸出。

在上述技术方案的基础上，连接导体 B6 和连接导体 A5 上设有相互适配的螺纹或卡槽。控制器与发生器通过连接导体 B6 和连接导体 A5 连接，具体的连接方式除了螺纹连接和卡槽卡接外，也可采用现有技术实现。在上述技术方案的基础上，连接导体 B6 和连接导体 A5 间通过中空的接触铜帽螺纹连接或卡槽连接。控制器与发生器通过连接导体 B6 和连接导体 A5 连接后即可组成一个类似香烟型的整体。

在上述技术方案的基础上，为了安全、美观、便于使用，控制器与发生器外表面均设有不锈钢外壳，软性吸嘴 13 内设有阻液槽 15，软性吸嘴 13 外端面上设有阻液封盖 17，控制器左端部或指示灯盖 14

上设有通气孔 16。阻液槽 15 与阻液封盖 17 是为了防止药液被吸入口中。通气孔 16 的用途是保证控制器左侧空间（即：驻极体传声器 4 将控制器分割后的左侧空间）的散热良好。

在上述技术方案的基础上，发生器的不锈钢外壳内还设有隔热层。其目的是为了避免加热器 9 的高温带来安全隐患。

在上述技术方案的基础上，集成线路板 3 包括了整个系统的控制电路，其电子延时功能、电子清洁复位功能由软件程序来实现，还包括了加热器驱动电路和控制器 IC1。集成线路板 3 接收驻极体传声器的信号，送到控制器 IC1 分析处理后，变成控制加热器的控制信号，同时控制器 IC1 还向信号指示灯发出亮灭控制信号。整个电路简单实用，可以根据功能需求采用现有技术实现。

现代的单片机技术、生物学、微电子学等一系列的生物、物理现象为本实用新型提供了技术依据。本实用新的优点是：吸烟无焦油、一氧化碳等有害物，大大降低致癌风险，吸烟者仍然有吸烟的感觉，无需点燃，无火灾危险。其吸出的烟雾其实是药液气化的水蒸气，无环境污染。采用 3.7～4.2 伏低压弱电平供电，能耗低，其工作过程中没有燃烧物产生，没有烟灰，没有明火，无火灾隐患，容易使大众接受。

以下通过图 3～6 的具体实施例进一步解释本实用新型的技术方案：

图 3 为连接导体 A5、连接导体 B6 及振动膜片 7 的结构示意图，如图所示：连接导体 A5 侧面设有进气孔 702，进气孔 702 将连接导体 A5 的中空部分和发生器的外部连通，在连接导体 A5 的右侧设有既可遮盖进气孔 702 又可用于加强及延长气流振动的振动膜片 7，在吸烟者抽吸时，气流从进气孔 702 进入，带动振动膜片 7 振动，进而在连接导体 B 的中空部分 606 形成振动，从而触发驻极体传声器发出低频信号，集成线路板上的控制器 IC1 对低频信号进行采样、分析，控制加热器 9 开始工作，以配合吸烟者抽吸；当吸烟者吸力减小时，振

动膜片 7 停止振动，进气孔 702 和发生器之间的气流通路被振动膜片 7 隔断，驻极体传声器停止工作，控制器 IC1 接收不到低频信号，因此控制加热器 9 停止工作。实现了在小气流的作用下接通和断开加热器 9，即：实现了控制加热器的实时加热。所说的振动膜片 7 可用橡胶或硅胶制成。如图 3 所示，所述连接导体 A5 和连接导体 B6 分别由内螺纹 602 与外螺纹 604 组成连接的外圈，用于连接加热器的引入导线的负极经过集成线路板 3 到可充电锂电池 2，由两个中空的柱形导体 601、603 连接加热器的引入导线的正极经过集成线路板 3 到可充电锂电池 2；在正负极 601、603 和 602、604 中间用绝缘材圈 605 隔开。其实例中绝缘材圈 605 可用硅胶或像胶做成，也可用其它绝缘材料做成。连接导体 B6 和连接导体 A5 间通过中空的接触铜帽螺纹连接或卡槽连接时，同样要注意正负极间的绝缘问题，可以采用现有技术实现。

图 4 为阻液片 8、次级贮液室 10、加热器 9 及导液机构 11 的结构示意图，如图所示：加热器 9 包括设有加热丝 901 的雾化工作室和其外面的隔热座 902，在隔热座 902 底部和侧面分别开有喷射孔 904 和溢流孔 903，加热丝 901 可用铂丝、镍铬合金或含有稀土元素的铁铬铝合金丝制成，也可制成片状体或环状，隔热座 902 可用陶瓷等制成。在加热器右侧设有导液机构 11，导液机构 11 由支撑架 1101 与导液体 1102 组成，其支撑架 1101 起固定作用，导液体 1102 由多层泡沫镍网或其它金属多孔体制成，所述的导液体 1102 还可用不锈钢纤维毡、高分子多聚物发泡体及泡沫陶瓷制成。加热器的左侧是次级贮液室 10，所述次级贮液室 10 为多层泡沫镍网填充在隔热座 902 底部与周边构成，导液机构 11 的一端通过导液体 1102 与次级贮液室 10 相连，另一端与贮液室 12 接触。次级贮液室 10 可暂存药液，阻液片 8 可防止次级贮液室 10 内的药液流出，避免药液流入控制器内影响电路。其工作过程如下：在气流的作用下，将小液滴通过隔热座 902 中的喷射孔 904 吸入隔热座 902 的另一侧，在加热丝 901 的作用

下，液体瞬间雾化，再由溢流孔 903 流出加热器 9，然后由软性吸嘴与贮液室 12 之间作为气流通道的间隙流到软性吸嘴 13 处，最后经软性吸嘴 13 吸出。

图 5 为吸嘴部份气流循环及软性吸嘴 13 的结构示意图，如图所示：软性吸嘴 13 设在发生器的右端面上，其软性硅胶有很好的口感可以轻微咀嚼，在软性吸嘴 13 的内侧还设有一个用软性硅胶制成的防止液体吸入口中的阻液槽 15。所述软性吸嘴 13 左端 1301 延长至阻液器 8 底部，其材料可用聚丙烯 PP 等环保材料制成，可有效防止内部热量的传出。软性吸嘴 13 还设有由软性硅胶制成的阻液封盖 17 以防止液体吸入口中。阻液槽 15 和贮液室 12 一端接触，贮液室 12 是一端开口的筒状物，中间置入药用棉纤，然后装入药原液，通过导液机构 11 的毛细作用，将存在贮液室 12 内的药液导入次级贮液室 10。如图所示：由溢流孔 903 流出的雾化药液，经过软性吸嘴与贮液室 12 之间作为气流通道的间隙流到阻液槽 15，再流到阻液封盖 17，最后吸入吸烟者嘴中。

集成线路板 3 包括了整个系统的控制电路，其电子延时功能、电子清洁复位功能由软件程序来实现，还包括了加热器驱动电路和控制器 IC1。图 6 为集成线路板 3 的电路原理示意图，如图所示，所述集成线路板使用控制器 IC1 控制，IC1 为核心智能控制单元，主要负责接收并判别输入信号，同时对信号指示灯与加热器进行控制，整个装置用 3.7V 锂离子电池供电，VCC 代表接电池正极，GND 代表接电池负极。图中 S、K 两个端子连接驻极体传声器的正负极，驻极体传声器提供的控制信号可以视为一个开关 S1 提供的通断信号。控制器 IC1 以十秒第次检测电池电压（即：每隔十秒检测一次），首先判断此时电源电压是否高于 3.3V，如果是，则在对驻极体传声器发出的信号进行分析后，对符合规则的信号转换成开关信号，输出控制信号给加热器驱动电路，三极管对控制器 IC1 输出信号进行放大，发热丝接通

电源发热，加热器工作，把液态的烟碱液瞬间加热，同时输出显示信号使 LED 发出红色或橙色光，模拟香烟的火头，也可输出延时信号使 LED 灯渐亮或渐灭。使模拟烟头更加形像；如果电池电压低于 3.3V，则关闭驻极体传声器，此时加热室不产生任何动作，当整机无动作时，控制器 IC1 进入休眠状态，整机功耗＜15uA，使整机待机时间尽可能延长理论待机时间两年半；当使用者在一分钟内连续使用本装置十五次时，控制器 IC1 将发出信号，切断加热电路输出，同时输出信号给 LED 指示灯，连续闪烁 10 秒；当 S1 连续接通 6 秒以上时，则自动切断加热电路，同时输出信号给 LED 等。控制器 IC1 还可写入其它程序以实现更多的功能和为后序的更新改善提供便利。也可以在信号输出端接一 LCD 显示屏来显示更多的信息。本实用新型用控制器 IC1 来控制其工作过程，保证电子烟工作可靠，吸烟方式更加形象，控制器 IC1 可以采用现有技术实现，例如：选用现有的单片机作为控制器 IC1，只要能实现上述基本功能，对单片机的具体选择并不限定。本实用新型吸出的“烟”其实是药液气化后的“水蒸气”，不含烟焦油，一氧化碳，苯并芘，多环芳烃，亚硝胺、偶氮杂质等都是强致癌物，“水蒸气”在空气中很快会液化，不污染环境。其加热部份是低电压低电流下瞬间加热，不燃烧，没有火灾隐患。其外壳用特种不锈钢制成，可有效屏蔽电磁波。更具体的说：控制器 IC1 的第 1 引脚分别和电容 C1 的一端、电阻 R7 的一端、电阻 R1 的一端、三极管 Q1 的集电极连接，电阻 R7 的另一端和 VCC 端子连接，三极管 Q1 的发射极分别和电阻 R5 的一端、控制器 IC1 的第 4 引脚连接，电阻 R1 的另一端分别和三极管 Q1 的基极、电阻 R2 的一端连接，电阻 R2 的另一端分别和 K 端子、电阻 R4 的一端连接，电阻 R4 的另一端和电阻 R5 的另一端、GND 端子、HEATER-端子连接，控制器 IC1 的第 2 引脚和电阻 R3 的一端连接，电阻 R3 的另一端和 K 端子连接，控制器 IC1 的第 3 引脚分别和 HEATER+端子、电阻 R6 的一端连接，电阻 R6 的另一端和 GND 端子连接，控制器 IC1 的第 5 引脚通过 LE 端子和 LED 灯 D1 的正极连接，LED 灯 D1 的负极和电阻 R8 的一端连接，电阻 R8 的另一端和 GND

端子连接，控制器 IC1 的第 6 引脚和 MOS FET Q2 的栅极连接，MOS FET Q2 的源极和 HEATER+端子连接、漏极和电源 VCC 连接，IC 芯片的第 7 引脚和 S 端子连接，控制器 IC1 的第 8 引脚分别和电容 C1 的另一端、GND 端子连接，HEATER-端子和加热器 HEATER 负极连接，HEATER+端子和加热器 HEATER 正极连接，开关 S1 连接在 K 端子和 S 端子之间。

控制器 IC1 可以选择 Microchip 公司生产的世界上最小的 8 位单片机 PIC12C5xx 系列。

本实例的工作过程如下：控制器与发生器通过连接导体 A、B 连接后，组成一环保型非可燃性雾化电子香烟；当吸烟者抽吸时，气流经连接导体 A 侧的进气孔进入发生器，经过振动膜片，阻液片，加热器，最后由吸嘴吸出；而控制器与发生器的连接导体中间开有通孔，在吸烟者抽吸时，控制器内部的气流流向发生器，从而激活控制电路，而在控制器的另一侧在指示灯盖铡也开有通气孔，使电池部份型腔与大气压相通，这样在控制组件一侧气体振动的作用下，驻极体传声器发出低频信号，IC1 分析振动性质，发出开关信号，从而导通电流，此时指示灯在 IC1 控制下慢慢变亮，同时电流通过连接导体使加热器工作；在加热室由于气流作用药液以微滴形式喷射进雾化室，药液通过加热器的作用瞬间雾化，雾化后的大直径微滴在涡流的作用下附壁经溢流孔被导液机构重吸收，小直径微滴悬浮在气流中形成水蒸气经雾汽通道和吸嘴吸出。

以上所述，仅为本实用新型的较佳实例而已，并非用于限制本实用新型的保护范围。任何熟悉本技术领域的技术人员在本实用新型揭露的技术范围内，可轻易想到的变化，都应涵盖在本实用新型的保护范围之内。

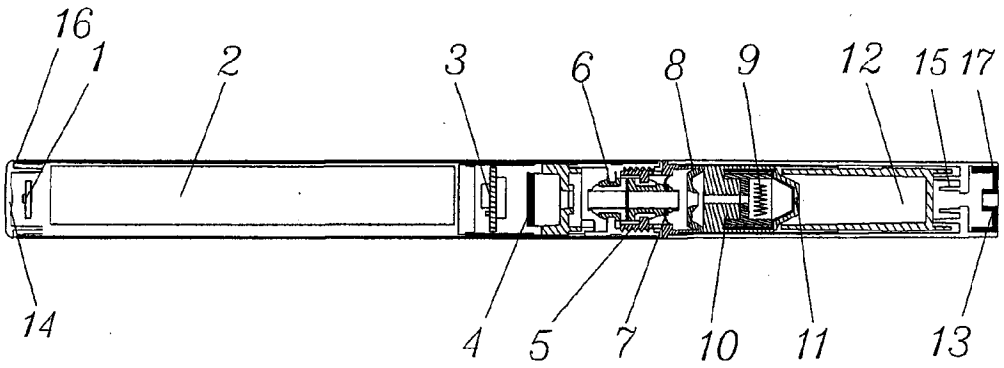


图 1

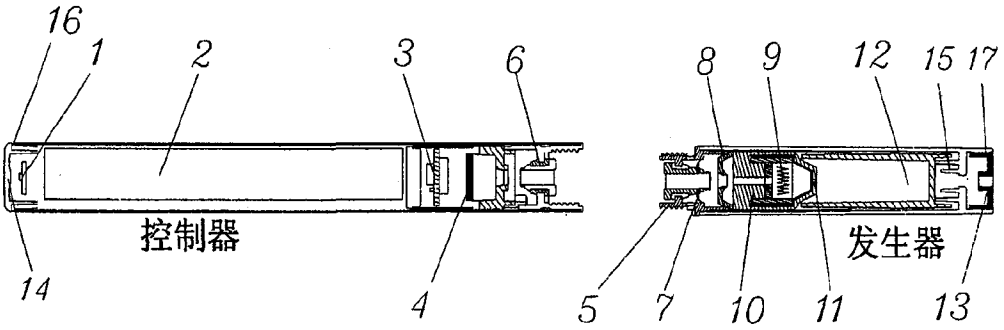


图 2

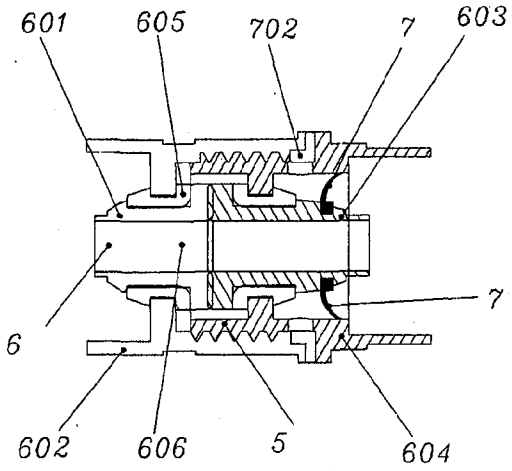


图 3

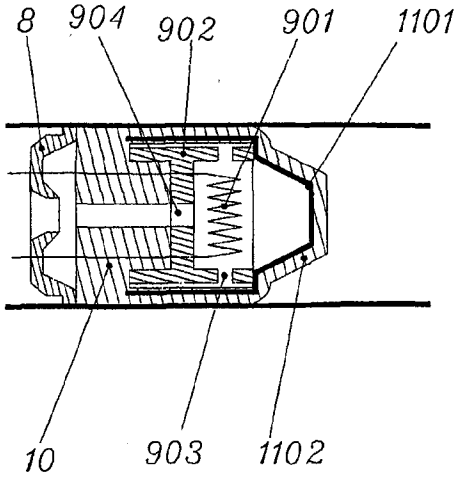


图 4

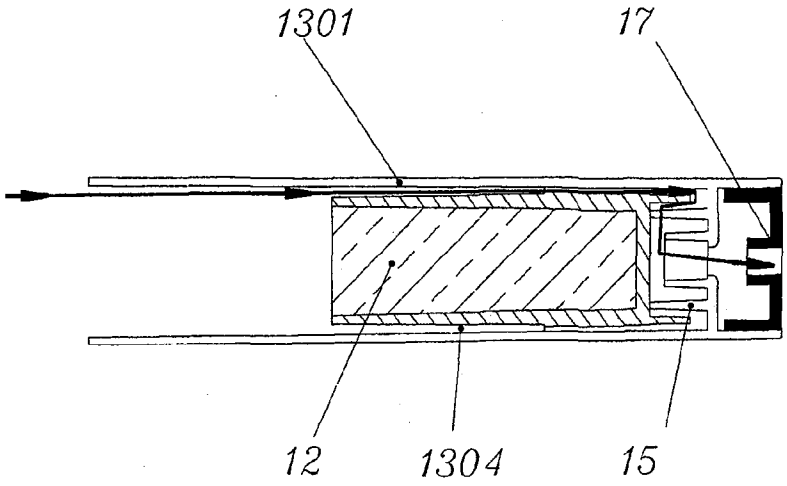


图 5

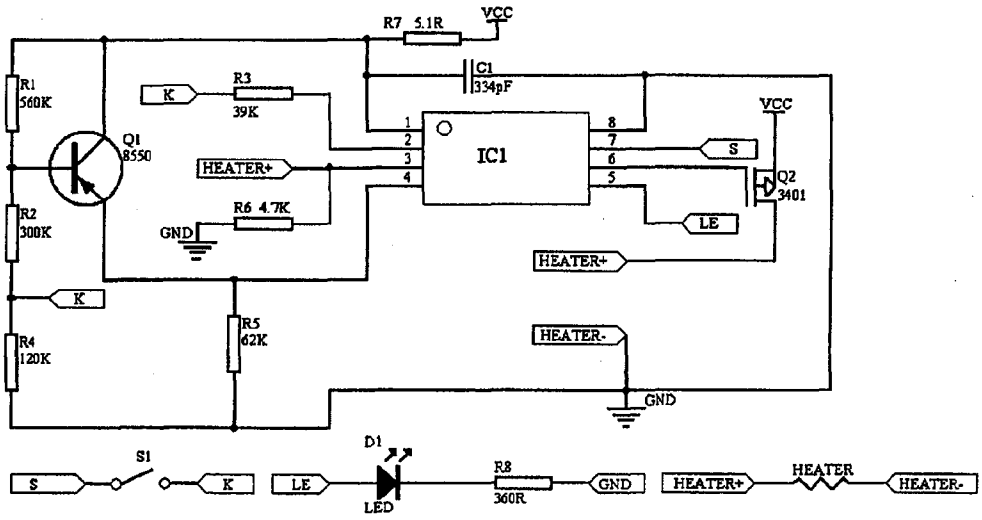


图 6

PN - CN201067728Y Y 20080604
OPD - 2007-07-17
PA - ZHU XIAOCHUN LI JIANWEI [CN]
IN - XIAOCHUN ZHU [CN]
TI - Oral suction type domestic atomizer
AB - The utility model discloses a sucking type home-use atomization device, comprising a control component and an executive component; wherein, the control component are internally and successively provided with an electricity power device, a control circuit board component, a pneumatic transmission switch and a connecting conductor; the executive component are internally and successively provided with a connecting conductor, a fluid resistant device, an atomizer chamber, a fluid storage core and a suction nozzle; one side of the connecting conductor is provided with an air inlet; an airflow channel is arranged between the suction nozzle and the fluid storage core. The utility model has the advantages of convenient carrying and using, good effect, being capable of pumping and sucking at any time and at any place for users, preventing the trouble that patients have physical treatment at a certain time only by changing liquid medicine and also being capable of treating the disease in nose, throat, respiratory tract and lung caused by smoking or allergy.
ICAI - B05B17/00; A61M11/00; A61M15/00; B05B1/24
ICCI - B05B17/00; A61M11/00; A61M15/00; B05B1/00
AP - CN20072054207U 20070717
PR - CN20072054207U 20070717
FAMN - 39489099
PD - 2008-06-04

AN - 2008-L21929 [66]
OPD - 2007-07-17
PD - 2008-06-04
AP - CN20072054207U 20070717
PA - (ZHUX-I) ZHU X
CPY - ZHUX-I
IN - ZHU X
TI - Suction type atomization device for use in home, has control component orderly equipped with power source device, control circuit board component and air pressure transmission switch
AB - NOVELTY :
The device has a control component orderly equipped with a power source device, a control circuit board component and an air pressure transmission switch, and an execution component orderly equipped with a connecting conductor, a liquid stopper, an atomization room with a heater, a liquid storage core and a suction mouth. One side of the control component is equipped with an indicator lamp. The heater is made of platinum wire, nickel chromium alloy or iron, chromium and aluminum alloy wire with rare earth element. The liquid stop sheet is made of nylon or other thermo tolerant material.
- USE :
Suction type atomization device for use in home.
- ADVANTAGE :
The device can be conveniently carried, thus allowing users to suck at any time and any places. The medicine liquid can be easily changed. The device can prevent physiotherapy trouble of patients at fixed term while traveling by ships and cars, and can cure diseases on nose, throat, respiratory tract and lung caused by smoking or hyper susceptibility.
- DESCRIPTION OF DRAWINGS :
The drawing shows a side view of a suction type atomization device.
PN - CN201067728Y Y 20080604 DW200866
NC - 1
IW - SUCTION TYPE ATOMISE DEVICE HOME CONTROL COMPONENT ORDER EQUIP POWER SOURCE CIRCUIT BOARD AIR PRESSURE TRANSMISSION SWITCH

[19] 中华人民共和国国家知识产权局

[12] 实用新型专利说明书

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权利要求书 2 页 说明书 7 页 附图 4 页

[54] 实用新型名称

一种口吸式家用雾化器

[57] 摘要

本实用新型公开了一种口吸式家用雾化器，包括控制组件与执行组件，所述控制组件内依次设有电源装置、控制线路板组件、气压传动开关、连接导体，所述执行组件内依次设有连接导体、阻液器、雾化室和贮液芯和吸嘴，所述连接导体一侧上开有进气孔，所述在吸嘴与贮液芯中间有气流通道。 本实用新型的技术效果在于：本实用新型的口吸式家用雾化器携带、使用方便，效果好，使用者可以随时随地的抽吸，只要更换药液既可避免患者舟车劳顿定期物理治疗的麻烦，还能治疗因吸烟或过敏引发的鼻、咽、呼吸道及肺部病症。

1、一种口吸式家用雾化器，其特征在于：包括控制组件与执行组件，所述控制组件内依次设有电源装置、控制线路板组件、气压传动开关、连接导体，所述执行组件内依次设有连接导体、阻液器、雾化室和贮液芯和吸嘴，所述连接导体一侧上开有进气孔，所述在吸嘴与贮液芯中间有气流通道。

2、如权利要求 1 所述的口吸式家用雾化器，其特征在于：所述控制组件的一端设有指示灯，在指示灯侧开有通气孔。

3、如权利要求 1 或 2 所述的口吸式家用雾化器，其特征在于：所述锂电池、控制线路板组件、气压传动开关外面设置有控制杆外壳，阻液器、雾化室和贮液芯外侧设有执行杆外壳。

4、如权利要求 1 所述的口吸式家用雾化器，其特征在于：所述气压传动开关内设有薄膜，将气压传动开关分开成两个独立的腔室。

5、如权利要求 4 所述的口吸式家用雾化器，其特征在于：所述气压传动开关内设有薄膜还包括小胶棒和接触铜片， 所述小胶棒从薄膜伸出连接薄膜与接触铜片，在控制线路板组件设有两片指向薄膜的铜片支架。

6、如权利要求 1 所述的口吸式家用雾化器，其特征在于：所述雾化室包括加热器、油嘴座、加热器、阻液片、油嘴支架，加热器固定在雾化室内，油嘴座上开有喷射孔连通雾化室内外，阻液片设置在雾化室的外侧防止液体倒流，阻液片和油嘴支架上也开有通气孔。

7、如权利要求 6 所述的口吸式家用雾化器，其特征在于：所述雾化室还包括导液机构，包在油嘴支架和油嘴座的外面包有可吸收液

体的泡沫状金属，其材料可用镍做成。

8、如权利要求 6 所述的口吸式家用雾化器，其特征在于：所述加热器用铂丝、镍铬合金或含有稀土元素的铁铬铝合金丝制成，制成片状体、螺旋状或环状，阻液片由尼龙或其它耐温材料组成。

一种口吸式家用雾化器

技术领域

本实用新型涉一种口吸式家用雾化器。

背景技术

众所周知，在当今由于工业大气污染以及烟酒过量等客观原因使然，至使在人类鼻咽炎（癌）及肺部等呼吸道疾病发病不断提高，并习惯于症状严重才就医及传统的消化道西药加静脉注射对人体造成的毒副作用越来越至医患无奈。工作的压力及生活节奏的加快使人们不得不借助吸烟，饮酒来提神或缓解压力，而吸烟饮酒的危害人所共知。能否开辟一项既药效准确，或替代吸烟饮酒又方便随时随地使用，而起“病从浅中医、治疗达病灶”的仪器能解患者之困？

针对上述问题，有许多实用新型将药物分子通过诸如‘加湿器”，“离子器”，“补氧机”等器械雾化或加热供患者使用，这些产品虽然能解决患者之需，但一般设备庞大，结构复杂，并且需要有专门的场地和专门的人员操作，且价格昂贵。频繁的使用给患者的工作活带来诸多不便。

发明内容

本实用新型的目的在于提供一种具有提神和咽肺部加湿的口吸式家用雾化器，避免了上述缺点，更方便使用者的操作和使用。

本实用新型的目的是通过以下技术方案来实现的：一种口吸式家用雾化器，包括控制组件与执行组件，所述控制组件内依次设有电源装置、控制线路板组件、气压传动开关、连接导体，所述执行组件内依次设有连接导体、阻液器、雾化室和贮液芯和吸嘴，所述连接导体一侧上开有进气孔，所述在吸嘴与贮液芯中间有气流通道。

本实用新型的技术方案还包括：所述控制组件的一端设有指示灯，在指示灯侧开有通气孔。

本实用新型的技术方案还包括：所述锂电池、控制线路板组件、气压传动开关外面设置有控制杆外壳，阻液器、雾化室和贮液芯外侧设有执行杆外壳。

本实用新型的技术方案还包括：所述气压传动开关内设有薄膜，将气压传动开关分开成两个独立的腔室。

本实用新型的技术方案还包括：所述气压传动开关内设有薄膜还包括小胶棒和接触铜片， 所述小胶棒从薄膜伸出连接薄膜与接触铜片，在控制线路板组件设有两片指向薄膜的铜片支架。

本实用新型的技术方案还包括：所述雾化室包括加热器、油嘴座、加热器、阻液片、油嘴支架，加热器固定在雾化室内，油嘴座上开有喷射孔连通雾化室内外，阻液片设置在雾化室的外侧防止液体倒流，阻液片和油嘴支架上也开有通气孔。

本实用新型的技术方案还包括：所述雾化室还包括导液机构，包在油嘴支架和油嘴座的外。

本实用新型的技术方案还包括：所述加热器用铂丝、镍铬合金或

含有稀土元素的铁铬铝合金丝制成，制成片状体或环状，阻液片由尼龙或其它耐温材料组成。

本实用新形的技术效果在于：现代的超声雾化学、生物学、微电子学等一系列生物、物理现象为本实用新型提供了技术依据。本实用新型可将治疗鼻、咽、上呼吸道及肺部疾病的药液雾化成直径极小的颗粒，供使用者抽吸，经过雾化的药液颗粒直径微小，作为鼻、咽、肺内给药仪器吸收效果远远优于直接服用药液，能更好的促进病症的治疗；大大改善药物吸收效果，真正实现防病、治病目的。本产品携带、使用方便，效果好，使用者可以随时随地的抽吸，只要更换药液既可避免患者舟车劳顿定期物理治疗的麻烦，还能治疗因吸烟或过敏引发的鼻、咽、呼吸道及肺部病症。

本实用新型的特征及优点将通过实施例结合附图进行详细说明。

附图说明

图 1 是本实用新型实施例的口吸式家用雾化器整体结构示意图；

图 2 是本实用新型实施例的口吸式家用雾化器拆分结构示意图；

图 3 是本实用新型实施例非的可燃性电子喷雾香烟中雾化室与导液机构的结构示意图；

图 4 是本实用新型实施例非的可燃性电子喷雾香烟中导液机构与雾化室及与贮液芯的连接结构图；

图 5 是本实用新型实施例的口吸式家用雾化器中气压传动开关的结构示意图；

图 6 是本实用新型实施例的口吸式家用雾化器中电器原理示意图；

图 7 是本实用新型实施例的口吸式家用雾化器中模拟烟液的雾化循环示意图。

具体实施方式

本实施例的口吸式家用雾化器包括控制组件与执行组件，控制组件与执行组件通过中通的连接导体连接。

请参阅图 1，在控制组件的一端设有一半透明的指示灯盖 1，在指示灯盖 1 下面有一个发光二极管作为指示灯，在指示灯侧开有一隐蔽的通气孔 12，控制组件另一端设有连接导体 5 用于和执行组件连成一个整体。指示灯盖 1 至连接导体 5 间依次设有锂电池 2、控制线路板组件 3、气压传动开关 4，锂电池 2、控制线路板组件 3、气压传动开关 4 外面设置有控制杆外壳 11。在气压传动开关 4 内有一薄膜，该薄膜将锂电池 2、控制线路板组件 3 与连接导体 5 分成两个相对独立的腔室。控在执行组件的一侧也设有连接导体 5，另一侧设有吸嘴 9。连接导体 5 与吸嘴 9 间依次设有阻液器 6、雾化室 7 和贮液芯 10。阻液器 6、雾化室 7 和贮液芯 10 外侧设有执行杆外壳 8。在连接导体 5 一侧上开有进气孔，在吸嘴 9 与执行杆外壳 8 中间有气流通道。

请一并参阅图 2，锂电池 2 是内置的，控制组件的连接导体 5 连入充电器可实现充电，而与执行组件连接后可组成一口吸式家用雾化器。

请参阅图 3，雾化室 7 包括加热器 701、其内的油嘴座 702、加热器 701、阻液片 704、导液机构 705 和外层的油嘴支架 706。加热器 701 固定在雾化室 7 内，加热器 701 可用铂丝、镍铬合金或含有稀土元素的铁铬铝合金丝制成，也可制成片状体或环状。在油嘴座 702 上开有喷射孔 703 连通雾化室 7 内外。阻液片 704 设置在雾化室 7 的外侧防止液体倒流，阻液片 704 由尼龙或其它耐温材料组成。在阻液片 704 和油嘴支架 706 上也开有通气孔。导液机构 705 为多层泡沫镍网，包在油嘴支架 701 和油嘴座 702 的外面。

请一并参阅图 4，导液机构 705 的一端与阻液片 704 接触，另一端凸起与贮液芯 10 的贮液芯 101 中的多孔体 102 接触。多孔体 102 内贮有药液，本实用新型中多孔体可由聚丙纤维、绦纶纤维或尼龙纤维充填。导液机构 705 通过毛细浸润作用将药液导至阻液片 704 与油嘴座 702 之间的空腔内，在气流的作用下，将小液滴通过油嘴座 702 中的喷射孔 703 吸入油嘴座 702 的另一侧，在加热器 701 的作用下，液体瞬间雾化，然后由开在贮液芯 101 外侧的通孔经吸嘴 9 吸出。导液机构 705 还可用不锈钢纤维毡、高分子多聚物发泡体及泡沫陶瓷制成。

请参阅图 5，气压传动开关 4 内部有一薄膜 402 将气压传动开关 3 分开成两个独立的腔室，在薄膜 402 上连有一伸出的小胶棒 401 用于连接薄膜 402 与接触铜片 403，在控制线路板组件 3 上同样有两片指向薄膜 402 的铜片支架 404，当使用都抽吸时，有气流的作用下，在薄膜 402 的右侧形成一个负压腔，在负压的作用下薄膜 402 向右移

动，同时带动连接在小胶棒 401 上的接触铜片 403 向右移动，从而与连接在控制线路板组件 3 上的铜片支架 404 导通；当使用都停止抽吸时，薄膜 402 在弹力作用下回复原位，小胶棒 401 左移，铜片 403 与铜片支架 404 断开，即可实现在小气流的作用下接通和断开开关，从而控制加热器 701 的实时加热。

请参阅图 6，气流开关 K1、单片机 32。吸气时气流开关 K1 闭合，K1 闭合后单片 2 脚电位被拉低，单片机 32 从睡眠状态被唤醒，单片机 32 被唤醒后随即进入工作状态，此后 6 脚向稳压管 Q2 输送触发信号使稳压管 Q2 导通工作。稳压管 Q2 工作后随即拉动雾化头工作使烟液雾化；单片机 32 的第 1 脚同时发出脉宽调制信号触发指示灯点亮工作。当气流开关 K1 断开后单片机 32 又处于睡眠状态。单片机 32 具有记数锁存功能和低电压提示功能，当使用都过于频繁的使用本机时，会自动断开电源，以帮助使用者合理使用本产品。当开关动作到 1500 次时单片机会发出清洗指令，让雾化头自动清洗 6 秒钟；当电池电压过低时，指示灯会连续闪烁 20 秒钟提示电压过低。此单片机还可写入其它程序以实现更多的功能和为后序的更新改善提供便利。

本实施例的的口吸式家用雾化器工作过程如下：控制组件与执行组件通过连接导体5连接后组成一口吸式家用雾化器；当使用都抽吸时，气流从执行组件侧的进气孔进入执行组件，经过阻液器6、雾化室7和贮液芯10，最后由吸嘴9吸出；而控制组件与执行组件的连接导体5中间开有通孔，在使用者抽吸时，执行组件的气流流向气嘴，从

而带动控制组件的连接导体5侧独立形腔部份低于正常大气压，而在控制组件的另一侧开有通气孔12，使电池部份形腔与大气压相通，这样在控制组件一侧负气压的作用下，开关气嘴向连接导体5一侧拉伸，从而带动其上面的接触铜片403，导通电流，此时指示灯在延时电路控制下慢慢变亮，同时电流通过连接导体5、阻液器6导通到雾化室7；在雾化室7由于气流作用药液以微滴形式喷射进雾化室，药液通过加热器的作用瞬间雾化，雾化后的大直径微滴在涡流的作用下附壁经溢流孔被导液机构重吸收，小直径微滴悬浮在气流中形成气溶胶经雾汽通道和吸嘴吸出，图7为模拟烟液的雾化循环示意图。

以上所述，仅为本实用新型的较佳实例而已，并非用于限制本实用新型的保护范围。任何熟悉本技术领域的技术人员在本实用新型揭露的技术范围内，可轻易想到的变化，都应涵盖在本实用新型的保护范围之内。

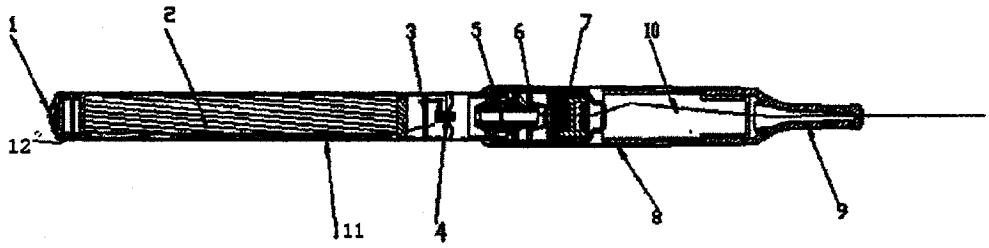

图 1

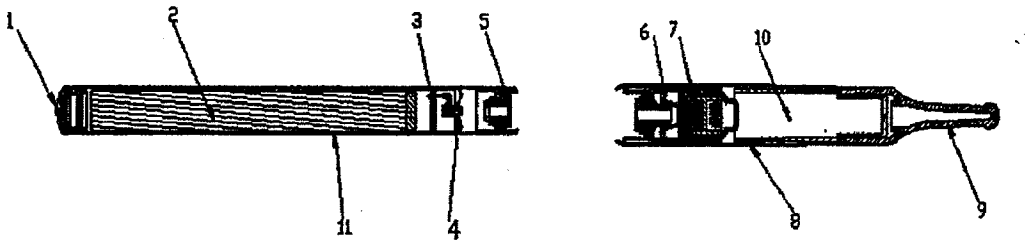

图 2

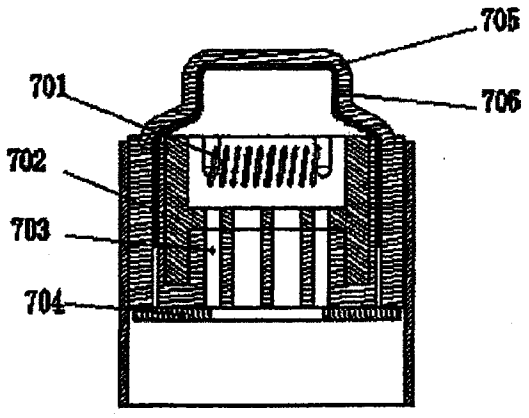

图 3

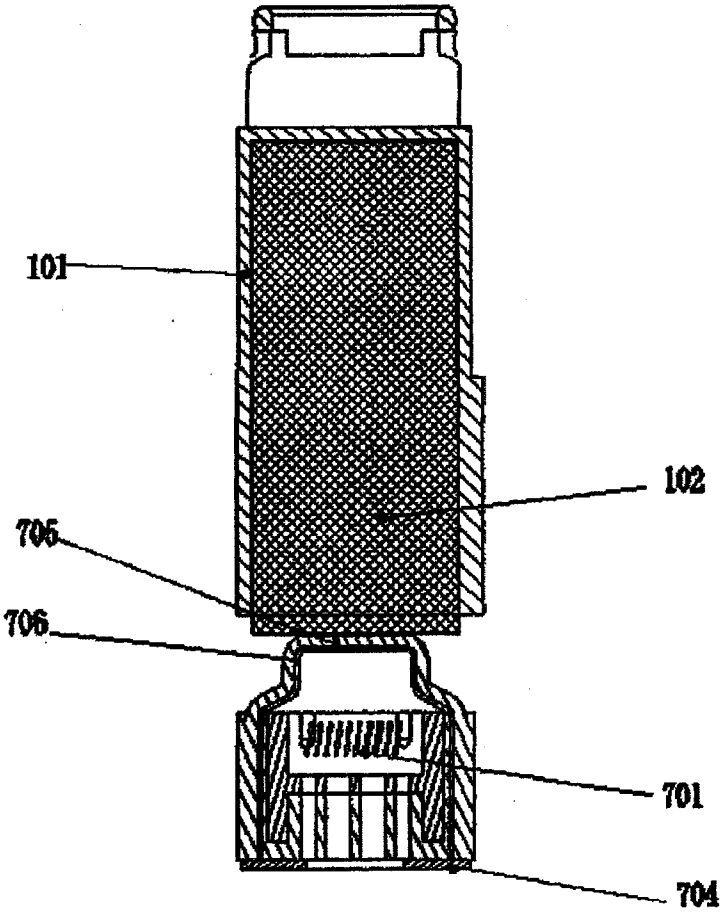

图 4

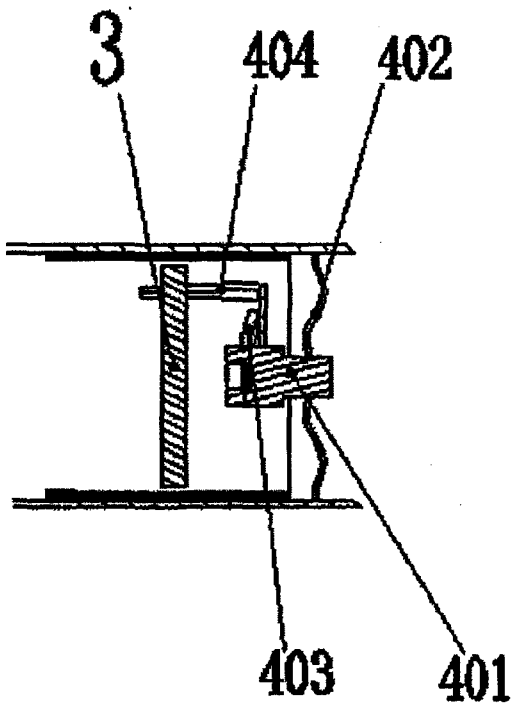

图 5

Electronic Patent Application Fee Transmittal

Application Number:	12437511
Filing Date:	07-May-2009
Title of Invention:	Electronic Cigarette
First Named Inventor/Applicant Name:	Guocheng Pan
Filer:	Norman L. Morales/Carolyn Winter
Attorney Docket Number:	104372.00002

Filed as Small Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Request for continued examination	2801	1	465	465
		Total in USD ($)		**465**

Electronic Acknowledgement Receipt

EFS ID:	12221920
Application Number:	12437511
International Application Number:	
Confirmation Number:	7646
Title of Invention:	Electronic Cigarette
First Named Inventor/Applicant Name:	Guocheng Pan
Customer Number:	44955
Filer:	Norman L. Morales/Carolyn Winter
Filer Authorized By:	Norman L. Morales
Attorney Docket Number:	104372.00002
Receipt Date:	07-MAR-2012
Filing Date:	07-MAY-2009
Time Stamp:	17:10:09
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$465
RAM confirmation Number	4270
Deposit Account	071850
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Continued Examination (RCE)	104372_2_RCE.pdf	125030 22e277310c972d71e13e56d4d0a8e1cd8e689da3	no	1
Warnings:					
This is not a USPTO supplied RCE SB30 form.					
Information:					
2	Amendment After Final	104372_2_Response_to_Final.pdf	126066 240e4c09a6b3c22a402bb9672421ae91f4fe8bed	no	12
Warnings:					
Information:					
3	Drawings-only black and white line drawings	104372_2_Replacement_Sheet.pdf	212276 fd5992bace242988ad62788f156c905a14d45296	no	2
Warnings:					
Information:					
4	Transmittal Letter	104372_2_IDS_Statement.pdf	66220 c9a9b4b8a3eaab1d31da9e9a53eba05ebab1b5b9	no	2
Warnings:					
Information:					
5	Information Disclosure Statement (IDS) Form (SB08)	104372_2_Form_1449.pdf	64872 f7c04fbd62846b173d7101b41faee5775e7fd798	no	1
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
6	Non Patent Literature	104372_2_UKIPO_Report.pdf	235502 910a8fb273cabccd03e32581ab9dff87a4f1e266	no	5
Warnings:					
Information:					
7	Foreign Reference	EP_0845220_A1.pdf	1135437 83cbea8bb6f4b4f30a872dc174ef67c2e7ee6e92	no	20
Warnings:					
Information:					
8	Foreign Reference	WO2009_152651_A1.pdf	658163 2011179775ac77e39ddd96051a9eceda49781edd	no	12

Warnings:					
Information:					
9	Foreign Reference	CN201379073_Y.pdf	714788 f62747b4b430a6cc58d5fc050d162ee6fbe4a366	no	15
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10	Foreign Reference	CN201238610_Y.pdf	984388 f0640a7a07d686632d20652af6a1830e4488a13d	no	19
Warnings:					
Information:					
11	Foreign Reference	CN201067728_Y.pdf	545519 4a0a539c4d09e30726656314dbf6f96bf6dc05e5	no	14
Warnings:					
Information:					
12	Fee Worksheet (SB06)	fee-info.pdf	30001 32db3004016702cc8701d6930adf760c5f37f573	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	4898262	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

<u>New International Application Filed with the USPTO as a Receiving Office</u>
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
12/437,511	05/07/2009	

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY ☒ RATE ($)	SMALL ENTITY ☒ FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT 03/07/2012	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 20	Minus	** 20	= 0	X $30 =	0	OR	X $ =	
Independent (37 CFR 1.16(h))	* 5	Minus	***3	= 2	X $125 =	250	OR	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE	250	OR	TOTAL ADD'L FEE	

AMENDMENT	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)	OR	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/MAMYE WAGSTAFF/

Document code: WFEE

United States Patent and Trademark Office
Sales Receipt for Accounting Date: 03/08/2012

MWAGSTAF	SALE	#00000001	Mailroom Dt:	03/07/2012	071850	12437511
	01	FC : 2201		250.00 DA		

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

44955 7590 05/11/2012
SQUIRE SANDERS (US) LLP
275 BATTERY STREET, SUITE 2600
SAN FRANCISCO, CA 94111-3356

EXAMINER
SZEWCZYK, CYNTHIA

ART UNIT	PAPER NUMBER
1741	

DATE MAILED: 05/11/2012

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/437,511	05/07/2009	Guocheng Pan	104372.00002	7646

TITLE OF INVENTION: ELECTRONIC CIGARETTE

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$870	$300	$0	$1170	08/13/2012

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

44955 7590 05/11/2012
SQUIRE SANDERS (US) LLP
275 BATTERY STREET, SUITE 2600
SAN FRANCISCO, CA 94111-3356

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/437,511	05/07/2009	Guocheng Pan	104372.00002	7646

TITLE OF INVENTION: ELECTRONIC CIGARETTE

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$870	$300	$0	$1170	08/13/2012

EXAMINER	ART UNIT	CLASS-SUBCLASS
SZEWCZYK, CYNTHIA	1741	131-273000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:
- ❑ Issue Fee
- ❑ Publication Fee (No small entity discount permitted)
- ❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ❑ A check is enclosed.
- ❑ Payment by credit card. Form PTO-2038 is attached.
- ❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ❑ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.
- ❑ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/437,511	05/07/2009	Guocheng Pan	104372.00002	7646

44955 7590 05/11/2012

SQUIRE SANDERS (US) LLP
275 BATTERY STREET, SUITE 2600
SAN FRANCISCO, CA 94111-3356

EXAMINER	
SZEWCZYK, CYNTHIA	

ART UNIT	PAPER NUMBER
1741	

DATE MAILED: 05/11/2012

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 435 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 435 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No.	Applicant(s)	
	12/437,511	PAN, GUOCHENG	
	Examiner	Art Unit	
	CYNTHIA SZEWCZYK	1741	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *3/7/12*.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *1-14 and 16-19*.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☒ All b) ☐ Some* c) ☐ None of the:
      1. ☒ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 3/7/12
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

/Matthew J. Daniels/
Supervisory Patent Examiner, Art Unit 1741

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Norman Morales on May 3, 2012.

The application has been amended as follows:

1. (Currently Amended) An electronic cigarette comprising a tubular electronic inhaler and a tubular electronic atomizer that is detachably attached to the electronic inhaler, wherein the electronic inhaler includes an electric power source that provides an electric current to the electronic atomizer, and wherein the tubular electronic atomizer includes a container and media within the container, the media is soaked with a solution to be atomized, and between the container and the media there is a side-space for airflow tubular electronic, and wherein the tubular electronic inhaler includes an electric airflow sensor configured to turn on and off the electric power source by way of detecting an airflow, and the airflow sensor is a diaphragm microphone.

2. (previously presented) An electronic cigarette comprising a tubular electronic inhaler and a tubular electronic atomizer, wherein the electronic inhaler includes an electric power source that provides an electric current to the electronic atomizer, the electronic cigarette further comprising an integrated circuit board that has a Single Chip Micyoco that controls atomization of a liquid solution.

3. (previously presented) An electronic cigarette comprising a tubular electronic inhaler and a tubular electronic atomizer, wherein the electronic inhaler includes an electric power source that provides an electric current to the electronic atomizer, the electronic cigarette further comprising an electric airflow sensor that is used to turn on and off the electric power source by way of detecting an airflow and sending a signal to a Single Chip Micyoco, wherein the Single Chip Micyoco receives the signal from the electric airflow sensor, instructs the electric power source to send an electric current to the electronic atomizer, and a time period and a magnitude of the electric current.

4. (previously presented) The electronic cigarette of claim 3, wherein the electric airflow sensor is a diaphragm microphone.

5. (original) The electronic cigarette of claim 3, further comprising an LED indicator inside the electronic inhaler, wherein the LED indicator is connected to the Single Chip Micyoco and the electric power source, and wherein the on time of the LED indicator is controlled by the Single Chip Micyoco.

6. (previously presented) An electronic cigarette comprising a tubular electronic inhaler and a tubular electronic atomizer, wherein the electronic inhaler includes an electric power source that provides an electric current to the electronic atomizer, wherein the electronic inhaler includes, sequentially from a first end of the electronic inhaler to the second end, a cigarette cap, an LED indicator, the electric power source, an electric airflow sensor, a circuit board for a Single Chip Micyoco, and a first electric connector.

7. (original) The electronic cigarette of claim 1, wherein the electronic inhaler includes a first electric connector disposed at a second end of the electronic inhaler, wherein the electronic atomizer includes a second electric connector disposed at a first end of the electronic atomizer, and wherein the first electric connector is connected to the second electric connector so that the electronic inhaler and the electronic atomizer form the electronic cigarette.

8. (Previously Presented) The electronic cigarette of claim 1, wherein the liquid container prevents or reduces liquid leak and reverse flow.

9. (Previously Presented) The electronic cigarette of claim 8, wherein the electronic atomizer includes an electric heating wire which generates heat for atomization of the solution soaked in the media inside the liquid container, a heat equalizer onto which the electric heating wire is wired and is made of fibers that can withstand a temperature up to 2000 degrees centigrade, wherein the heat equalizer ensures that the heat generated by the electric wire is uniform, and a supporting piece that is disposed next to the heat equalizer and is made of a plastic or ceramic material that can withstand a temperature up to 2000 degrees centigrade.

10. (previously presented) The electronic cigarette of claim 9, wherein the electronic atomizer includes a leak-proof member, wherein the leak-proof member and a second electric connector are closer to the first end of the electronic atomizer than the heat equalizer.

11. (Previously Presented) The electronic cigarette of claim 1, wherein the electronic atomizer includes, in sequence, a second electric connector, a leak-proof

piece, a supporting piece, a heat equalizer coupled with an electric heating wire, the container filled with the media, and an atomizer cap with an air-puffing hole.

12. (original) The electronic cigarette of claim 1, wherein the electric power source is inside the electronic inhaler.

13. (original) The electronic cigarette of claim 10, where the first electric connector is a DC socket and the second electric connector is a DC plug, wherein the DC plug is embedded onto the leak-proof piece through a plug seat, which is connected to the electric heating wire, and wherein the first end of the electronic atomizer is connected to the second of the electronic inhaler by placing the DC plug to the DC socket.

14. (Currently Amended) The electronic cigarette of claim 13, wherein the first electric connector is a cylinder terminal, and its outskirt is tightly embedded into the second end of the electric inhaler tube and its exposed portion has a screw thread, wherein the second electric connector is a cylinder terminal, which is tightly embedded into the first end of the electronic atomizer and has a screw thread inside the inhaler tube, and wherein the [[fist]] first electric connector and second electric connector are connected through the screw threads.

15. (Canceled).

16. (Previously Presented) The electronic cigarette of claim 1, wherein the tubular electronic atomizer includes an exterior wall having an air-puffing hole formed therethrough, wherein the liquid container includes a container wall, there being a chamber disposed between the exterior wall and the container wall, and wherein the

tubular electronic atomizer includes a tube extending from the air-puffing hole and into the chamber.

17. (Previously Presented) The electronic cigarette of claim 1, wherein the media comprises cotton.

18. (Currently Amended) An electronic cigarette comprising:

a tubular electronic inhaler; and

a tubular electronic atomizer that is detachably attached to the electronic inhaler,

wherein the electronic inhaler includes an electric power source that provides an electric current to the electronic atomizer,

wherein the tubular electronic atomizer includes a container and media within the container, the media is soaked with a solution to be atomized,

wherein the tubular electronic atomizer includes an exterior wall having an air-puffing hole formed therethrough, wherein the liquid container includes a container wall, there being a chamber disposed between the exterior wall and the container wall, [[and]]

wherein the tubular electronic atomizer includes a tube extending from the air-puffing hole and into the chamber, and

wherein the tubular electronic inhaler includes an electric airflow sensor configured to turn on and off the electric power source by way of detecting an airflow, and the airflow sensor is a diaphragm microphone.

19. (Previously Presented) The electronic cigarette of claim 18, wherein the tubular electronic atomizer includes, in sequence, an electric connector, a leak-proof

piece, a supporting piece, a heat equalizer coupled with an electric heating wire, the container filled with the media, and the air-puffing hole.

20. (Canceled).

2. The following is an examiner's statement of reasons for allowance: Counts et al. (US 5,060,671) and Susa et al. (EP 0845220 A1) are considered the closest prior art to the invention. It is noted that while prior art exists to teach electronic cigarettes having the atomizing solution soaked into a media (see Robinson et al. US 2008/0092912), neither Counts nor Susa teach or suggest using a diaphragm microphone as the airflow sensor.

3. Claims 2-6 teach that the electronic cigarette includes a Single Chip Micyoco to control the atomization. Although SUSA teaches using a circuit board to control the operation, SUSA does not teach or suggest specifically using a Single Chip Micyoco to control the atomization in the electronic cigarette. It is noted that "Single Chip Micyoco" has been interpreted to be a type of chip, and not a trademark.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CYNTHIA SZEWCZYK whose telephone number is

(571)270-5130. The examiner can normally be reached on Monday through Friday 9 am to 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Daniels can be reached on (571) 272-2450. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Cynthia Szewczyk/
Examiner, Art Unit 1741

/Matthew J. Daniels/
Supervisory Patent Examiner, Art Unit 1741

Notice of References Cited	Application/Control No. 12/437,511	Applicant(s)/Patent Under Reexamination PAN, GUOCHENG	
	Examiner CYNTHIA SZEWCZYK	Art Unit 1741	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2008/0092912	04-2008	Robinson et al.	131/200
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L2	265	electronic adj cigarette	EPO; JPO; DERWENT	OR	ON	2012/05/03 14:13
S1	1	12/437511.app.	US-PGPUB; USPAT	OR	OFF	2011/08/30 11:29
S2	1	pan-guocheng.in.	US-PGPUB; USPAT	OR	OFF	2011/08/30 12:06
S3	144	131/273.ccls.	US-PGPUB; USPAT	OR	OFF	2011/08/30 15:18
S4	59	"131".clas. and atomizer	US-PGPUB; USPAT	OR	OFF	2011/09/06 12:13
S5	1	"20100242974"	EPO; JPO; DERWENT	OR	OFF	2011/09/06 12:14
S7	104	"131".clas. and atomiz$5 and current	US-PGPUB; USPAT	OR	OFF	2011/09/06 12:20
S8	18	131/273.ccls. and atomiz$3	US-PGPUB; USPAT	OR	OFF	2011/09/06 12:22
S9	19	131/273.ccls. and atomiz$5	US-PGPUB; USPAT	OR	OFF	2011/09/06 12:22
S10	7	131/273.ccls. and atomiz$5 and current	US-PGPUB; USPAT	OR	OFF	2011/09/06 12:22
S11	1	"20080092912".pn.	US-PGPUB; USPAT	OR	OFF	2011/09/06 12:23
S12	1	"131".clas. and micyoco	US-PGPUB; USPAT	OR	OFF	2011/09/06 12:24
S13	1	"131".clas. and micyoco	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/06 12:24
S14	30	micyoco	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/06 12:24
S15	5	"131".clas. and scm	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/06 12:24
S16	1	micyoco and tobacco	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/06 12:26
S17	1	micyoco and cigarette	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/06 12:26
S18	19	"131".clas. and atomiz$5 and DC	US-PGPUB; USPAT	OR	OFF	2011/09/06 12:28
S19	19	"131".clas. and atomiz$5 and DC	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/06 12:28
S20	2	WO-2005099494-$.did.	EPO; JPO; DERWENT	OR	OFF	2011/09/06 12:30

S22	32175	micyoco andf cigarette	EPO; JPO; DERWENT	OR	OFF	2011/09/06 12:31
S23	0	micyoco and cigarette	EPO; JPO; DERWENT	OR	OFF	2011/09/06 12:31
S24	0	micyoco and smoking	EPO; JPO; DERWENT	OR	OFF	2011/09/06 12:31
S25	1	micyoco and smoking	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/06 12:31
S26	4	131/273.ccls. and atomiz$5 and leak$3	US-PGPUB; USPAT	OR	OFF	2011/09/06 12:36
S27	123	"131".clas. and atomiz$5 and (electric or electronic)	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/06 12:37
S28	18	"131".clas. and atomiz$5 and (electric or electronic) and leak$3	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/06 12:37
S29	7	EP-845220-$.did. WO-2009152651-$.did. CN-201379073-$.did. CN-201238610-$.did. CN-201067728-$.did.	EPO; JPO; DERWENT	OR	OFF	2011/09/06 12:41
S30	82	"131".clas. and wire with fiber	US-PGPUB; USPAT; USOCR	OR	ON	2011/09/09 14:14
S31	2	"131".clas. and heat with equalizer	US-PGPUB; USPAT; USOCR	OR	ON	2011/09/09 14:20
S32	209	"131".clas. and socket and plug	US-PGPUB; USPAT; USOCR	OR	ON	2011/09/09 14:39
S33	17	"131".clas. and socket and plug and DC	US-PGPUB; USPAT; USOCR	OR	ON	2011/09/09 14:39
S34	1	micyoco and smoking	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/09 15:02
S35	39	micyoco	EPO; JPO; DERWENT	OR	OFF	2011/09/09 15:07
S36	9965	SCM	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/12 09:41
S37	632	SCM with chip	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/12 09:41
S38	53	SCM near chip	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/12 09:51
S39	15	micyoco.clm.	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/12 10:20
S40	5	"131".clas. and SCM	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/12 10:26
S41	3	"131".clas. and single adj chip	US-PGPUB; USPAT; USOCR	OR	OFF	2011/09/12 10:27
S42	24	tobacco and single adj chip	EPO; JPO;	OR	OFF	2011/09/12

			DERWENT			10:41
S43	17	cigarette and single adj chip	EPO; JPO; DERWENT	OR	OFF	2011/09/12 10:43
S44	1	cigarette and SCM NOT S42 NOT S43	EPO; JPO; DERWENT	OR	OFF	2011/09/12 10:45
S45	1	cigarette and SCM	EPO; JPO; DERWENT	OR	OFF	2011/09/12 10:45
S46	3	tobacco and SCM	EPO; JPO; DERWENT	OR	OFF	2011/09/12 10:45
S47	68	"131".clas. and electric with cigarette and sensor	US-PGPUB; USPAT; USOCR	OR	OFF	2011/12/14 10:14
S48	1	"131".clas. and electric adj cigarette and sensor	US-PGPUB; USPAT; USOCR	OR	OFF	2011/12/16 14:06
S49	19	"131".clas. and atomizer and sensor	US-PGPUB; USPAT; USOCR	OR	OFF	2011/12/16 14:06
S50	18	"131".clas. and electronic adj cigarette and sensor	US-PGPUB; USPAT; USOCR	OR	OFF	2011/12/16 14:06
S51	3	"131".clas. and (electronic adj cigarette or atomizer) and sensor and detach$5	US-PGPUB; USPAT; USOCR	OR	ON	2011/12/16 14:25
S52	4	"131".clas. and (electronic adj cigarette or atomizer) and sensor and disconnect$3	US-PGPUB; USPAT; USOCR	OR	ON	2011/12/16 14:37
S53	18	"131".clas. and (electronic adj cigarette or atomizer or aerosol) and sensor and disconnect$3	US-PGPUB; USPAT; USOCR	OR	ON	2011/12/16 14:39
S54	10	"131".clas. and (electronic adj cigarette or atomizer or aerosol) and sensor and detach$5	US-PGPUB; USPAT; USOCR	OR	ON	2011/12/16 14:42
S55	10	"131".clas. and (electronic adj cigarette or atomizer or aerosol or vaporizor) and sensor and detach$5	US-PGPUB; USPAT; USOCR	OR	ON	2011/12/16 14:58
S56	0	"131".clas. and vaporizor	US-PGPUB; USPAT; USOCR	OR	ON	2011/12/16 14:58
S57	42	"131".clas. and vaporizer	US-PGPUB; USPAT; USOCR	OR	ON	2011/12/16 14:58
S58	1	"131".clas. and vaporizer and detach$5	US-PGPUB; USPAT; USOCR	OR	ON	2011/12/16 14:58
S59	607	"131".clas. and cotton	US-PGPUB; USPAT	OR	OFF	2012/02/14 10:38
S60	170	"131".clas. and cotton same (solution or liquid or flavor$3)	US-PGPUB; USPAT	OR	OFF	2012/02/14 10:39
S61	59	"131".clas. and cotton and (electric)	US-PGPUB; USPAT	OR	OFF	2012/02/14 10:40
S62	34	"131".clas. and cotton and (electric)	USOCR	OR	OFF	2012/02/14 10:44
S63	27	"131".clas. and cotton and (atomiz$4)	US-PGPUB; USPAT; USOCR	OR	OFF	2012/02/14 10:44

S64	2	"2445476".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/02/14 10:46
S65	14	"131".clas. and cotton and (nebuliz$3)	US-PGPUB; USPAT; USOCR	OR	OFF	2012/02/14 10:48
S66	254	"131".clas. and atomiz$5	US-PGPUB; USPAT	OR	OFF	2012/05/01 15:00
S67	213	"131".clas. and atomiz$5 and (liquid or solution)	US-PGPUB; USPAT	OR	OFF	2012/05/01 15:00
S68	19	"131".clas. and atomiz$5 and (liquid or solution) and (soak$3)	US-PGPUB; USPAT	OR	OFF	2012/05/01 15:01
S69	42	"131".clas. and atomiz$5 and (liquid or solution) and (saturat$3)	US-PGPUB; USPAT	OR	OFF	2012/05/01 15:09
S70	126	"131".clas. and diaphragm	US-PGPUB; USPAT	OR	OFF	2012/05/01 15:12
S71	29	"131".clas. and diaphragm and sensor	US-PGPUB; USPAT	OR	OFF	2012/05/01 15:12
S72	5	"131".clas. and diaphragm with sensor	US-PGPUB; USPAT	OR	OFF	2012/05/01 15:12
S73	5	"131".clas. and diaphragm with sensor	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/01 15:13
S74	9296	diaphragm with sensor	EPO; JPO; DERWENT	OR	OFF	2012/05/01 15:13
S75	2	diaphragm with sensor and cigarette	EPO; JPO; DERWENT	OR	OFF	2012/05/01 15:13
S76	1	diaphragm with sensor and tobacco	EPO; JPO; DERWENT	OR	OFF	2012/05/01 15:13
S77	15263	diaphragm with sensor	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/01 15:14
S78	27	diaphragm adj microphone with sensor	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/01 15:14
S79	3	diaphragm with sensor and cigarette	EPO; JPO; DERWENT	OR	ON	2012/05/01 15:19
S80	3	diaphragm with sensor and tobacco	EPO; JPO; DERWENT	OR	ON	2012/05/01 15:19
S81	30	diaphragm adj microphone with sensor	US-PGPUB; USPAT; USOCR	OR	ON	2012/05/01 15:20
S82	7	EP-845220-$.did. WO-2009152651-$.did. CN-201379073-$.did. CN-201238610-$.did. CN-201067728-$.did.	EPO; JPO; DERWENT	OR	ON	2012/05/01 15:23

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L3	19	@ay>="2009" and 131/273.ccls.	US-PGPUB; USPAT; UPAD	OR	ON	2012/05/03 14:14
L4	10	@ay>="2009" and "131".clas. and (air and flow and sensor).clm.	US-PGPUB; USPAT; UPAD	OR	ON	2012/05/03 14:15
L5	1	@ay>="2009" and "131".clas. and (diaphragm).clm.	US-PGPUB; USPAT; UPAD	OR	ON	2012/05/03 14:16

L6	1	@ay>="2009" and "131".clas. and (microphone).clm.	US-PGPUB; USPAT; UPAD	OR	ON	2012/05/03 14:16
L7	0	@ay>="2009" and "131".clas. and (SCM).clm.	US-PGPUB; USPAT; UPAD	OR	ON	2012/05/03 14:16
L8	1	@ay>="2009" and "131".clas. and (single and chip).clm.	US-PGPUB; USPAT; UPAD	OR	ON	2012/05/03 14:16
L9	1	@ay>="2009" and "131".clas. and (micyoco).clm.	US-PGPUB; USPAT; UPAD	OR	ON	2012/05/03 14:17

5/3/2012 2:17:33 PM
C:\Users\cszewczyk\Documents\EAST\Workspaces\12437511.wsp

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12437511	PAN, GUOCHENG
	Examiner	**Art Unit**
	CYNTHIA SZEWCZYK	1741

SEARCHED

Class	Subclass	Date	Examiner
131	273	9/2011	CS

SEARCH NOTES

Search Notes	Date	Examiner
EAST search history	9/2011	CS
Inventor search in EAST and eDAN	9/2011	CS
Assignee search in PALM	9/2011	CS
Updated EAST search	12/2011	CS
Updated EAST search	5/2012	CS

INTERFERENCE SEARCH

Class	Subclass	Date	Examiner
131	273	5/3/12	CS

FORM PTO-1449 (MODIFIED) US DEPARTMENT OF COMMERCE
US Patent and Trademark Office

INFORMATION DISCLOSURE CITATION in an Application

(Use several sheets if necessary)

Docket No.	Application No.
104372.00002	12/437,511

Applicant	
Guocheng Pan	

Filing Date	Group Art Unit
May 7, 2009	1746

U.S. PATENT DOCUMENTS

Examiner Initial	Ref. No.	Document Number	Date of Patent	Name	Class	Subclass	Filing Date if Appropriate
	A1						
	A2						
	A3						

U.S. PATENT APPLICATION PUBLICATION DOCUMENTS

Examiner Initial	Ref. No.	Document Number	Date of Publication	Name	Class	Subclass	Filing Date if Appropriate
	A4						
	A5						

FOREIGN PATENT DOCUMENTS

Examiner Initial	Ref. No.	Document Number	Date of Publication	Country	Class	Subclass	Translation Abstract Yes	Translation Abstract No
/C.S./	B1	EP 0845220 A1	6/3/98	Europe			X	
/C.S./	B2	WO 2009/152651 A1	12/23/09	WIPO			X	
/C.S./	B3	CN 201379073 Y	1/13/10	China			X	
/C.S./	B4	CN 201238610 Y	5/20/09	China			X	
/C.S./	B5	CN 201067728 Y	6/4/08	China			X	

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, etc.)

/C.S./	C1	UK Intellectual Property Office, "Combined Search and Examination Report" for Application No. GB0913768.8, report dated April 8, 2010 (5 pages)

EXAMINER	DATE CONSIDERED
/Cynthia Szewczyk/	05/03/2012

EXAMINER: Initial if references considered, whether or not citation is in conformance with MPEP § 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12437511	PAN, GUOCHENG
	Examiner	Art Unit
	CYNTHIA SZEWCZYK	1741

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	09/09/2011	12/18/2011	05/03/2012						
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	6	O	=	=						
	7	✓	✓	=						
	8	✓	✓	=						
	9	✓	✓	=						
	10	✓	✓	=						
	11	✓	✓	=						
	12	✓	✓	=						
	13	✓	✓	=						
	14	✓	✓	=						
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	16			=						
	17			=						
	18			=						
	19			=						
	20			-						

Issue Classification

Application/Control No.	Applicant(s)/Patent Under Reexamination
12437511	PAN, GUOCHENG
Examiner	**Art Unit**
CYNTHIA SZEWCZYK	1741

ORIGINAL		INTERNATIONAL CLASSIFICATION														
CLASS	SUBCLASS	CLAIMED									NON-CLAIMED					
131	273	A	2	4	F	47 / 00 (2006.0)										

CROSS REFERENCE(S)					
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	17	18												
2	7	18	19												
3	8														
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14	4														
15	5														
16	6														

/CYNTHIA SZEWCZYK/ Examiner.Art Unit 1741 (Assistant Examiner)	05/03/2012 (Date)	**Total Claims Allowed:** 18	
/MATTHEW DANIELS/ Supervisory Patent Examiner.Art Unit 1741 (Primary Examiner)	05/06/2012 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 6

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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BIB DATA SHEET

CONFIRMATION NO. 7646

SERIAL NUMBER	FILING or 371(c) DATE RULE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
12/437,511	05/07/2009	131	1741	104372.00002

APPLICANTS
Guocheng Pan, Cupertino, CA;

**** CONTINUING DATA ***************************

**** FOREIGN APPLICATIONS ***************************
CHINA 200910080147.5 03/24/2009

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED **** ** SMALL ENTITY **
05/15/2009

Foreign Priority claimed ☑ Yes ☐ No 35 USC 119(a-d) conditions met ☑ Yes ☐ No Verified and Acknowledged /CYNTHIA SZEWCZYK/ Examiner's Signature	☐ Met after Allowance Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
		CA	7	14	1

ADDRESS

SQUIRE SANDERS (US) LLP
275 BATTERY STREET, SUITE 2600
SAN FRANCISCO, CA 94111-3356
UNITED STATES

TITLE

Electronic Cigarette

FILING FEE RECEIVED		
712	FEES: Authority has been given in Paper No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

44955 7590 05/11/2012
SQUIRE SANDERS (US) LLP
275 BATTERY STREET, SUITE 2600
SAN FRANCISCO, CA 94111-3356

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I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/437,511	05/07/2009	Guocheng Pan	104372.00002	7646

TITLE OF INVENTION: ELECTRONIC CIGARETTE

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$870	$300	$0	$1170	08/13/2012

EXAMINER	ART UNIT	CLASS-SUBCLASS
SZEWCZYK, CYNTHIA	1741	131-273000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Squire Sanders (US) LLP
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☒ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:
☒ Issue Fee
☒ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number 07-1850 (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.
☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature /Norman Morales/ Date May 22, 2012

Typed or printed name Norman L. Morales Registration No. 55,463

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Electronic Patent Application Fee Transmittal

Application Number:	12437511
Filing Date:	07-May-2009
Title of Invention:	ELECTRONIC CIGARETTE
First Named Inventor/Applicant Name:	Guocheng Pan
Filer:	Norman L. Morales/Carolyn Winter
Attorney Docket Number:	104372.00002

Filed as Small Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl issue fee	2501	1	870	870
Publ. Fee- early, voluntary, or normal	1504	1	300	300

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**1170**

Electronic Acknowledgement Receipt

EFS ID:	12840481
Application Number:	12437511
International Application Number:	
Confirmation Number:	7646
Title of Invention:	ELECTRONIC CIGARETTE
First Named Inventor/Applicant Name:	Guocheng Pan
Customer Number:	44955
Filer:	Norman L. Morales/Carolyn Winter
Filer Authorized By:	Norman L. Morales
Attorney Docket Number:	104372.00002
Receipt Date:	22-MAY-2012
Filing Date:	07-MAY-2009
Time Stamp:	18:58:20
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$1170
RAM confirmation Number	6819
Deposit Account	071850
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	104372_2_Issue_Transmittal.pdf	231567 0937e35cc0b13a1aa74c61951a8eaca6d5b7d19c	no	1
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	31663 a74c90b5a642b48ff4d40f6fe9707214e2adec97	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	263230		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

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If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/437,511	06/26/2012	8205622	104372.00002	7646

44955 7590 06/06/2012

SQUIRE SANDERS (US) LLP
275 BATTERY STREET, SUITE 2600
SAN FRANCISCO, CA 94111-3356

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 435 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Guocheng Pan, Cupertino, CA;

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent No.	8,205,622	Issued:	June 26, 2012
Serial No.	12/437,511	Filed:	May 7, 2009
Inventor:	Guocheng Pan	Confirm. No.	7646
Title:	Electronic Cigarette		

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

NOTIFICATION OF LOSS OF ENTITLEMENT TO SMALL ENTITY STATUS PURSUANT TO 37 CFR §1.27(g)(2)

In accordance with 37 CFR §1.27(g)(2), the Office is hereby notified in writing that small entity status is no longer appropriate for the above identified patent. The status of this patent is to be changed to undiscounted fee status.

No fee payment is believed to be due for the filing of this paper. If in fact a fee is due for this paper, the Commissioner is authorized to charge such fee to Deposit Account No. **07-1850**.

Respectfully submitted,

Date: December 11, 2015

/Norman Morales/

Squire Patton Boggs (US) LLP
275 Battery Street, Suite 2600
San Francisco, CA 94111
Telephone (415) 393-9857
norman.morales@squirepb.com

Norman L. Morales
Attorney of Record
Reg. No. 55,463
Cust. No. 44955

Electronic Acknowledgement Receipt

EFS ID:	24332673
Application Number:	12437511
International Application Number:	
Confirmation Number:	7646
Title of Invention:	ELECTRONIC CIGARETTE
First Named Inventor/Applicant Name:	Guocheng Pan
Customer Number:	44955
Filer:	Norman L. Morales/Carolyn Winter
Filer Authorized By:	Norman L. Morales
Attorney Docket Number:	104372.00002
Receipt Date:	11-DEC-2015
Filing Date:	07-MAY-2009
Time Stamp:	11:02:02
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Notification of loss of entitlement to small entity status	104372_2_Notification_of_Loss_of_Entitlement_AS_FILED.pdf	107616 e396497a40b8cff3324150ae315c79c195b45d37	no	1

Warnings:	
Information:	

Total Files Size (in bytes):	107616

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New Applications Under 35 U.S.C. 111

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New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.