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PTO/AIA/15 (10-17)
Approved for use through 11/30/2017. OMB 0651-0032
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UTILITY PATENT APPLICATION TRANSMITTAL

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

Attorney Docket No.	R60999 1400US.C5 (1777.4)
First Named Inventor	John Howard Robinson
Title	TOBACCO-CONTAINING SMOKING ARTICLE
Priority Mail Express® Label No.	

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

1. [✔] **Fee Transmittal Form** (PTO/SB/17 or equivalent)
2. [ ] **Applicant asserts small entity status.** See 37 CFR 1.27
3. [ ] **Applicant certifies micro entity status.** See 37 CFR 1.29. Applicant must attach form PTO/SB/15A or B or equivalent.
4. [✔] **Specification** [*Total Pages* 49] Both the claims and abstract must start on a new page. *(See MPEP § 608.01(a) for information on the preferred arrangement)*
5. [✔] **Drawing(s)** (35 U.S.C. 113) [*Total Sheets* 5]
6. **Inventor's Oath or Declaration** [*Total Pages* 5] *(including substitute statements under 37 CFR 1.64 and assignments serving as an oath or declaration under 37 CFR 1.63(e))*
   a. [ ] Newly executed (original or copy)
   b. [✔] A copy from a prior application (37 CFR 1.63(d))
7. [✔] **Application Data Sheet** ** See note below.* See 37 CFR 1.76 (PTO/AIA/14 or equivalent)
8. **CD-ROM or CD-R** in duplicate, large table, or Computer Program (*Appendix*)
   [ ] Landscape Table on CD
9. **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
   c. [ ] Statements verifying identity of above copies

ADDRESS TO:

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

ACCOMPANYING APPLICATION PAPERS

10. [ ] **Assignment Papers** (cover sheet & document(s))
    Name of Assignee _____
11. [ ] **37 CFR 3.73(c) Statement** (*when there is an assignee*) [✔] **Power of Attorney**
12. [ ] **English Translation Document** (*if applicable*)
13. [✔] **Information Disclosure Statement** (PTO/SB/08 or PTO-1449)
    [ ] Copies of citations attached
14. [✔] **Preliminary Amendment**
15. [ ] **Return Receipt Postcard** (*MPEP § 503*) (*Should be specifically itemized*)
16. [ ] **Certified Copy of Priority Document(s)** (*if foreign priority is claimed*)
17. [ ] **Nonpublication Request** Under 35 U.S.C. 122(b)(2)(B)(i). Applicant must attach form PTO/SB/35 or equivalent.
18. [✔] **Other:** Certification and Request for Prioritized Examination Processing Fee Under 37 CFR 1.117(i)

*Note: (1) Benefit claims under 37 CFR 1.78 and foreign priority claims under 1.55 **must** be included in an Application Data Sheet (ADS).
(2) For applications filed under 35 U.S.C. 111, the application must contain an ADS specifying the applicant if the applicant is an assignee, person to whom the inventor is under an obligation to assign, or person who otherwise shows sufficient proprietary interest in the matter. See 37 CFR 1.46(b).

19. CORRESPONDENCE ADDRESS

[✔] The address associated with Customer Number: 26158 **OR** [ ] Correspondence address below

Name					
Address					
City		State		Zip Code	
Country		Telephone		Email	

Signature	/lauren f. anderson/	Date	January 24, 2018
Name (Print/Type)	Lauren F. Anderson	Registration No. (Attorney/Agent)	69,344

This collection of information is required by 37 CFR 1.53(b). 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: 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.

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.

PTO/SB/17 (01-18)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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FEE TRANSMITTAL

Complete if known	
Application Number	To Be Assigned
Filing Date	Concurrently Herewith
First Named Inventor	John Howard Robinson
Examiner Name	To Be Assigned
Art Unit	To Be Assigned
Practitioner Docket No.	R60999 1400US.C5 (1777.4)

☐ Applicant asserts small entity status. See 37 CFR 1.27.

☐ Applicant certifies micro entity status. See 37 CFR 1.29. Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously.

TOTAL AMOUNT OF PAYMENT ($) 6860

METHOD OF PAYMENT (check all that apply)

☐ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____

☒ Deposit Account Deposit Account Number: 09-0528 Deposit Account Name: _____

For the above-identified deposit account, the Director is hereby authorized to (check all that apply):

☒ Charge fee(s) indicated below ☐ Charge fee(s) indicated below, **except for the filing fee**

☒ Charge any additional fee(s) or underpayment of fee(s) under 37 CFR 1.16 and 1.17 ☒ Credit any overpayment of fee(s)

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.

FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES (U = undiscounted fee; S = small entity fee; M = micro entity fee)

	FILING FEES			SEARCH FEES			EXAMINATION FEES			
Application Type	**U ($)**	**S ($)**	**M ($)**	**U ($)**	**S ($)**	**M ($)**	**U ($)**	**S ($)**	**M ($)**	**Fees Paid ($)**
Utility	300	150*	75	660	330	165	760	380	190	1720
Design	200	100	50	160	80	40	600	300	150	
Plant	200	100	50	420	210	105	620	310	155	
Reissue	300	150	75	660	330	165	2,200	1,100	550	
Provisional	280	140	70	0	0	0	0	0	0	

* The $150 small entity status filing fee for a utility application is further reduced to $75 for a small entity status applicant who files the application via EFS-Web.

2. EXCESS CLAIM FEES

Fee Description	**Undiscounted Fee ($)**	**Small Entity Fee ($)**	**Micro Entity Fee ($)**
Each claim over 20 (including Reissues)	100	50	25
Each independent claim over 3 (including Reissues)	460	230	115
Multiple dependent claims	820	410	205

Total Claims		**Extra Claims**	**Fee ($)**		**Fee Paid ($)**
30	-20 or HP =	10	x 100	=	1000

HP = highest number of total claims paid for, if greater than 20.

Indep. Claims		**Extra Claims**	**Fee ($)**		**Fee Paid ($)**
2	-3 or HP =		x	=	

HP = highest number of independent claims paid for, if greater than 3.

Multiple Dependent Claims	**Fee ($)**	**Fee Paid ($)**

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is $400 ($200 for small entity) ($100 for micro entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets		**Extra Sheets**		**Number of each additional 50 or fraction thereof**	**Fee ($)**		**Fee Paid ($)**
54	- 100 =		/ 50 =	(round **up** to a whole number)	x	=	

4. OTHER FEE(S) **Fees Paid ($)**

Non-English specification, $130 fee (no small or micro entity discount) _____

Non-electronic filing fee under 37 CFR 1.16(t) for a utility application, $400 fee ($200 small or micro entity) _____

Other (e.g., late filing surcharge): Request for Prioritized Examination and processing fee 4140

SUBMITTED BY

Signature	/lauren f. anderson/	Registration No. (Attorney/Agent) 69,344	Telephone (919) 755-2100
Name (Print/Type)	Lauren F. Anderson		Date January 24, 2018

This collection of information is required by 37 CFR 1.136. 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 30 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: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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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.
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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.
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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.

Doc Code: TRACK1.REQ
Document Description: TrackOne Request

PTO/AIA/424 (04-14)

CERTIFICATION AND REQUEST FOR PRIORITIZED EXAMINATION UNDER 37 CFR 1.102(e) (Page 1 of 1)

First Named Inventor:	John Howard Robinson	Nonprovisional Application Number (if known):	
Title of Invention:	TOBACCO-CONTAINING SMOKING ARTICLE		

APPLICANT HEREBY CERTIFIES THE FOLLOWING AND REQUESTS PRIORITIZED EXAMINATION FOR THE ABOVE-IDENTIFIED APPLICATION.

1. The processing fee set forth in 37 CFR 1.17(i)(1) and the prioritized examination fee set forth in 37 CFR 1.17(c) have been filed with the request. The publication fee requirement is met because that fee, set forth in 37 CFR 1.18(d), is currently $0. The basic filing fee, search fee, and examination fee are filed with the request or have been already been paid. I understand that any required excess claims fees or application size fee must be paid for the application.

2. I understand that the application may not contain, or be amended to contain, more than four independent claims, more than thirty total claims, or any multiple dependent claims, and that any request for an extension of time will cause an outstanding Track I request to be dismissed.

3. The applicable box is checked below:

I. ☑ Original Application (Track One) - Prioritized Examination under § 1.102(e)(1)

i. (a) The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a). This certification and request is being filed with the utility application via EFS-Web.

---OR---

(b) The application is an original nonprovisional plant application filed under 35 U.S.C. 111(a). This certification and request is being filed with the plant application in paper.

ii. An executed inventor's oath or declaration under 37 CFR 1.63 or 37 CFR 1.64 for each inventor, **or** the application data sheet meeting the conditions specified in 37 CFR 1.53(f)(3)(i) is filed with the application.

II. ☐ Request for Continued Examination - Prioritized Examination under § 1.102(e)(2)

i. A request for continued examination has been filed with, or prior to, this form.
ii. If the application is a utility application, this certification and request is being filed via EFS-Web.
iii. The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a), or is a national stage entry under 35 U.S.C. 371.
iv. This certification and request is being filed prior to the mailing of a first Office action responsive to the request for continued examination.
v. No prior request for continued examination has been granted prioritized examination status under 37 CFR 1.102(e)(2).

Signature /lauren f. anderson/	Date January 24, 2018
Name (Print/Typed) Lauren F. Anderson	Practitioner Registration Number 69,344

Note: *This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. Submit multiple forms if more than one signature is required.**

☑ *Total of 1 forms are submitted.

Privacy Act Statement

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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.

PTO/SB/17i (05-15)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PROCESSING FEE Under 37 CFR 1.17(i) TRANSMITTAL

(Fees are subject to annual revision)

Send completed form to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450

Application Number	To Be Assigned
Filing Date	Concurrently Herewith
First Named Inventor	John Howard Robinson
Art Unit	To Be Assigned
Examiner Name	To Be Assigned
Practitioner Docket No.	R60999 1400US.C5 (1777.4)

Enclosed is a paper filed under 37 CFR 1.102(e) **that requires a processing fee (37 CFR 1.17(i)(1) or (2)).**

Payment of $ 140 **is enclosed.**

This form should be included with the above-mentioned paper and faxed or mailed to the Office using the appropriate Mail Stop, if applicable.
For transmittal of petition fees under 37 CFR 1.17(f), (g) or (h), see form PTO/SB/17p or PTO/AIA/17p, as applicable.

☐ Applicant asserts small entity status. See 37 CFR 1.27.

☐ Applicant certifies micro entity status. See 37 CFR 1.29.
Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously.

Payment of Fees

☑ The Commissioner is hereby authorized to charge the following fees to Deposit Account No. 09-0528:

☑ processing fee under 37 CFR 1.17(i)(1) ☐ processing fee under 37 CFR 1.17(i)(2) ☑ any deficiency of fees and credit of any overpayments

☐ Check in the amount of $ _____ is enclosed. ☑ Payment via EFS-Web.

☐ Payment by credit card (Form PTO-2038 or equivalent is enclosed). Do not provide credit card information on this form.

Processing Fees Under 37 CFR 1.17(i)(1):

Undiscounted Fee $140 (Fee Code 1053) Small Entity Fee $70 (Fee Code 2053) Micro Entity Fee $35 (Fee Code 3053)

For papers filed under:
§ 1.28(c)(3) - for processing a non-itemized fee deficiency based on an error in small entity status.
§ 1.29(k)(3) - for processing a non-itemized fee deficiency based on an error in micro entity status.
§ 1.41(b) - for supplying the name or names of the inventor or joint inventors in an application without either an application data sheet or the inventor's oath or declaration, except in provisional applications.
§ 1.48 - for correcting inventorship, except in provisional applications.
§ 1.52(d) - for processing a nonprovisional application filed with a specification in a language other than English.
§ 1.53(c)(3) - to convert a provisional application filed under § 1.53(c) into a nonprovisional application under § 1.53(b).
§ 1.71(g)(2) - for processing a belated amendment under § 1.71(g).
§ 1.102(e) - for requesting prioritized examination of an application.
§ 1.103(b) - for requesting limited suspension of action, continued prosecution application for a design patent (§ 1.53(d)).
§ 1.103(c) - for requesting limited suspension of action, request for continued examination (§ 1.114).
§ 1.103(d) - for requesting deferred examination of an application.
§ 1.291(c)(5) - for processing a second or subsequent protest by the same real party in interest.
§ 3.81 - for a patent to issue to assignee, assignment submitted after payment of the issue fee.

Processing Fees Under 37 CFR 1.17(i)(2):

Fee $130 (small and micro entity discounts are not available for the 37 CFR 1.17(i)(2) processing fee)

For papers filed under:
§ 1.217 - for processing a redacted copy of a paper submitted in the file of an application in which a redacted copy was submitted for the patent application publication. **FEE CODE 1808**
§ 1.221 - for requesting voluntary publication or republication of an application. **FEE CODE 1803**

SUBMITTED BY

Signature	/lauren f. anderson/	Registration No. (Attorney/Agent) 69,344	Telephone (919) 755-2100
Name (Print/Type)	Lauren F. Anderson		Date January 24, 2018

This collection of information is required by 37 CFR 1.17. 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 5 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: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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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.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	R60999 1400US.C5 (1777.4)
	Application Number	
Title of Invention	TOBACCO-CONTAINING SMOKING ARTICLE	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2:

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	John	Howard	Robinson	

Residence Information (Select One) ● US Residency Non US Residency Active US Military Service

City	State/Province	Country of Residence
Kernersville	NC	US

Mailing Address of Inventor:

Address 1	604 Antler Court
Address 2	
City	Kernersville
State/Province	NC
Postal Code	27284
Country	US

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	David	William	Griffith	

Residence Information (Select One) ◉ US Residency Non US Residency Active US Military Service

City	State/Province	Country of Residence
Winston-Salem	NC	US

Mailing Address of Inventor:

Address 1	4130 White Hawk Lane
Address 2	
City	Winston-Salem
State/Province	NC
Postal Code	27106
Country	US

Inventor 3 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Billy	Tyrone	Conner	

Residence Information (Select One) ◉ US Residency Non US Residency Active US Military Service

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	R60999 1400US.C5 (1777.4)
	Application Number	
Title of Invention	TOBACCO-CONTAINING SMOKING ARTICLE	

City	Clemmons	State/Province	NC	Country of Residence	US

Mailing Address of Inventor:

Address 1	180 Scott Farm Road		
Address 2			
City	Clemmons	State/Province	NC
Postal Code	27012	Country	US

Inventor 4 — Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Evon	Llewellyn	Crooks	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Mocksville	State/Province	NC	Country of Residence	US

Mailing Address of Inventor:

Address 1	749 Howell Road		
Address 2			
City	Mocksville	State/Province	NC
Postal Code	27028	Country	US

Inventor 5 — Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Dempsey	Bailey	Brewer	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	East Bend	State/Province	NC	Country of Residence	US

Mailing Address of Inventor:

Address 1	2853 Davis Road		
Address 2			
City	East Bend	State/Province	NC
Postal Code	27018	Country	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. — Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	R60999 1400US.C5 (1777.4)
	Application Number	
Title of Invention	TOBACCO-CONTAINING SMOKING ARTICLE	

Customer Number	26158		
Email Address	IPDocketing@wbd-us.com	Add Email	Remove Email

Application Information:

Title of the Invention	TOBACCO-CONTAINING SMOKING ARTICLE		
Attorney Docket Number	R60999 1400US.C5 (1777.4)	**Small Entity Status Claimed**	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	5	**Suggested Figure for Publication (if any)**	1

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	● Customer Number	US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	26158		

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	R60999 1400US.C5 (1777.4)
	Application Number	
Title of Invention	TOBACCO-CONTAINING SMOKING ARTICLE	

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status	Pending			Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)	
	Continuation of	15/286087	2016-10-05	

Prior Application Status	Patented			Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
15/286087	Continuation of	14/527287	2014-10-29	9801416	2017-10-31

Prior Application Status	Patented			Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
14/527287	Continuation of	13/297983	2011-11-16	8899238	2014-12-02

Prior Application Status	Patented			Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
13/297983	Continuation of	12/763890	2010-04-20	8079371	2011-12-20

Prior Application Status	Patented			Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
12/763890	Continuation of	11/550634	2006-10-18	7726320	2010-06-01

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button. Add

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Remove

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	R60999 1400US.C5 (1777.4)
	Application Number	
Title of Invention	TOBACCO-CONTAINING SMOKING ARTICLE	

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button. Add

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	R60999 1400US.C5 (1777.4)
	Application Number	
Title of Invention	TOBACCO-CONTAINING SMOKING ARTICLE	

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	R60999 1400US.C5 (1777.4)
	Application Number	
Title of Invention	TOBACCO-CONTAINING SMOKING ARTICLE	

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1 — Remove

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

● Assignee	Legal Representative under 35 U.S.C. 117	Joint Inventor
Person to whom the inventor is obligated to assign.	Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. ☒

Organization Name	RAI Strategic Holdings, Inc.		
Mailing Address Information For Applicant:			
Address 1	401 North Main Street		
Address 2			
City	Winston-Salem	**State/Province**	NC
Country	US	Postal Code	27101
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button. Add

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	R60999 1400US.C5 (1777.4)
	Application Number	
Title of Invention	TOBACCO-CONTAINING SMOKING ARTICLE	

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

Remove

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1			
Address 2			
City		**State/Province**	
Country i		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button. Add

Signature:

Remove

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). **However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).**

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/lauren f. anderson/			Date (YYYY-MM-DD)	2018-01-24
First Name	Lauren	Last Name	Anderson	Registration Number	69,344

Additional Signature may be generated within this form by selecting the Add button. Add

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	R60999 1400US.C5 (1777.4)
	Application Number	
Title of Invention	TOBACCO-CONTAINING SMOKING ARTICLE	

This collection of information is required by 37 CFR 1.76. 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 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet 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: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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 the Freedom of Information Act requires disclosure of these records.

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 CooperationTreaty.

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 inspections 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.

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TOBACCO-CONTAINING SMOKING ARTICLE

CROSS REFERENCE TO RELATED APPLICATIONS

This application is a continuation of U.S. App. No. 15/286,087; filed October 5, 2016, which is a continuation of U.S. App. No. 14,527,287; filed October 29, 2014, issued on October 31, 2017, as U.S. Patent No. 9,801,416, which is a continuation of U.S. Application No. 13/297,983, filed November 16, 2011, issued on December 2, 2014, as U.S. Patent No. 8,899,238, which is a continuation of U.S. Application No. 12/763,890, filed April 20, 2010 and issued on December 20, 2011 as U.S. Patent No. 8,079,371, which is a continuation of U.S. Application No. 11/550,634, filed on October 18, 2006 and issued on June 1, 2010 as U.S. Patent No. 7,726,320, which are each incorporated by reference herein in their entirety.

FIELD OF THE INVENTION

The present invention relates to tobacco products, such as tobacco-containing smoking articles.

BACKGROUND OF THE INVENTION

Popular smoking articles, such as cigarettes, have a substantially cylindrical rod shaped structure and include a charge, roll, or column of smokable material, such as shredded tobacco (e.g., in cut filler form), surrounded by a paper wrapper, thereby forming a so-called "smokable rod" or "tobacco rod." Normally, a cigarette has a cylindrical filter element aligned in an end-to-end relationship with the tobacco rod. Preferably, a filter element comprises plasticized cellulose acetate tow circumscribed by a paper material known as "plug wrap." Certain filter elements can incorporate polyhydric alcohols. See, for example, UK Pat. Spec. 755,475. Certain cigarettes incorporate a filter element having multiple segments, and one of those segments can comprise activated charcoal particles. See, for example, US Pat. Nos. 5,360,023 to Blakley et al. and 6,537,186 to Veluz. Preferably, the filter element is attached to one end of the tobacco rod using a circumscribing wrapping material known as "tipping paper." It also has become desirable to perforate the tipping material and plug wrap, in order to provide dilution of drawn mainstream smoke with ambient air. Descriptions of cigarettes and the various components thereof are set forth in *Tobacco Production, Chemistry and Technology,* Davis et al. (Eds.) (1999).

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Traditionally, a cigarette of the most popular type is employed by a smoker by lighting one end thereof and burning the tobacco rod. The smoker then receives mainstream smoke produced by the burning tobacco into his/her mouth by drawing on the opposite end (e.g., the filter end) of the cigarette.

Through the years, various methods for altering the composition of mainstream tobacco smoke have been proposed. In PCT Appl. Pub. No. WO 02/37990 to Bereman, it has been suggested that metallic particles and/or carbonaceous particles can be incorporated into the smokable material of a cigarette in an attempt to reduce the amounts of certain compounds in the smoke produced by that cigarette. In US Patent Appl. Pub. No. 2005/0066986 to Nestor et al., it has been suggested that a smokable rod possessing tobacco wrapped in paper can incorporate tobacco filler combined with an aerosol-forming material, such as glycerin. US Pat. No. 6,874,508 to Shafer et al. proposes a cigarette having a paper wrapped tobacco rod having a tip portion that is treated with an additive, such as potassium bicarbonate, sodium chloride or potassium phosphate.

Various tobacco substitute materials have been proposed, and substantial listings of various types of those materials can be found in US Pat. Nos. 4,079,742 to Rainer et al. and 4,771,795 to White et al. Certain cigarette-type products that employ non-tobacco materials (e.g., dried vegetable leaves, such as lettuce leaves) as filler that is burned to produce smoke that resembles tobacco smoke have been marketed under the trade names "Cubebs," "Triumph," "Jazz," and "Bravo." See, for example, the types of materials described in US Pat. No. 4,700,727 to Torigian. Furthermore, tobacco substitute materials having the trade names "Cytrel" and "NSM" were introduced in Europe during the 1970s. Representative types of proposed synthetic tobacco substitute materials, smokable materials incorporating tobacco and other components, and cigarettes incorporating those materials, are described in British Pat. No. 1,431,045; and US Pat. Nos. 3,738,374 to Bennett; 3,844,294 to Webster; 3,878,850 to Gibson et al.; 3,931,824 to Miano et al.; 3,943,941 to Boyd et al.; 4,044,777 to Boyd et al.; 4,233,993 to Miano et al.; 4,286,604 to Ehretsmann et al.; 4,326,544 to Hardwick et al.; 4,920,990 to Lawrence et al.; 5,046,514 to Bolt; 5,074,321 to Gentry et al.; 5,092,353 to Montoya et al.; 5,778,899 to Saito et al.; 6,397,852 to McAdam; and 6,408,856 to McAdam. Furthermore, various types of highly processed smokable materials incorporating tobacco and other

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ingredients are set forth in US Pat. Nos. 4,823,817 to Luke; 4,874,000 to Tamol et al.; 4,977,908 to Luke; 5,072,744 to Luke et al.; 5,829,453 to White et al.; and 6,182,670 to White et al.

Certain types of coaxial or concentric-type smoking articles have been proposed. There have been proposed cigarette-type smoking articles including tobacco smokable materials surrounding longitudinally extending cores of other materials. UK Pat. Appl. 2,070,409 proposes a smoking article having a rod of smoking material having at least one filament extending over at least a major portion of the length of the rod. US Pat. No. 3,614,956 to Thornton proposes a smoking article having an annular outer portion made of tobacco smoking material and a central cylindrical core of absorbent material. US Pat. No. 4,219,031 to Rainer et al. proposes a smoking article having a central core of carbonized fibers circumscribed by tobacco. US Pat. No. 6,823,873 to Nichols et al. proposes a cigarette including an ignition element surrounded by tobacco, which is in turn surrounded by a composite outer wrapper. One type of cigarette-type smoking article has included a rod of tobacco smokable material surrounded a longitudinally extending annulus of some other material. For example, US Pat. No. 5,105,838 to White et al. proposes a rod of smokable material, normally circumscribed by a layer of wrapping material, which is in turn circumscribed by an insulating material (e.g., glass filaments or fibers). PCT Appl. Pub. No. WO 98/16125 to Snaidr et al. proposes a smoking device constructed from a very thin cigarette designed to fit into a tubular ceramic cartridge.

Numerous references have proposed various smoking articles of a type that generate flavored vapor, visible aerosol, or a mixture of flavored vapor and visible aerosol. Some of those proposed types of smoking articles include tubular sections or longitudinally extending air passageways. See, for example, those types of smoking articles described in US Pat. Nos. 3,258,015 to Ellis et al.; 3,356,094 to Ellis et al.; 3,516,417 to Moses; 4,347,855 to Lanzellotti et al.; 4,340,072 to Bolt et al.; 4,391,285 to Burnett et al.; 4,917,121 to Riehl et al.; 4,924,886 to Litzinger; and 5,060,676 to Hearn et al. Many of those types of smoking articles have employed a combustible fuel source that is burned to provide an aerosol and/or to heat an aerosol-forming material. See, for example, the background art cited in US Pat. Nos. 4,714,082 to Banerjee et al. and 4,771,795 to White et al.; which are incorporated herein by reference. See, also, for example, those types of smoking articles described in US Pat. Nos. 4,756,318 to Clearman et al.; 4,714,082 to Banerjee et al.; 4,771,795 to White et al.; 4,793,365 to Sensabaugh et al.; 4,917,128 to Clearman et al.; 4,961,438 to Korte; 4,966,171 to Serrano et al.; 4,969,476 to Bale et al.;

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4,991,606 to Serrano et al.; 5,020,548 to Farrier et al.; 5,033,483 to Clearman et al.; 5,040,551 to Schlatter et al.; 5,050,621 to Creighton et al.; 5,065,776 to Lawson; 5,076,296 to Nystrom et al.; 5,076,297 to Farrier et al.; 5,099,861 to Clearman et al.; 5,105,835 to Drewett et al.; 5,105,837 to Barnes et al.; 5,115,820 to Hauser et al.; 5,148,821 to Best et al.; 5,159,940 to Hayward et al.; 5,178,167 to Riggs et al.; 5,183,062 to Clearman et al.; 5,211,684 to Shannon et al.; 5,240,014 to Deevi et al.; 5,240,016 to Nichols et al.; 5,345,955 to Clearman et al.; 5,551,451 to Riggs et al.; 5,595,577 to Bensalem et al.; 5,819,751 to Barnes et al.; 6,089,857 to Matsuura et al.; 6,095,152 to Beven et al; 6,578,584 Beven; and 6,730,832 to Dominguez; which are incorporated herein by reference. Furthermore, certain types of cigarettes that employ carbonaceous fuel elements have been commercially marketed under the brand names "Premier" and "Eclipse" by R. J. Reynolds Tobacco Company. See, for example, those types of cigarettes described in *Chemical and Biological Studies on New Cigarette Prototypes that Heat Instead of Burn Tobacco,* R. J. Reynolds Tobacco Company Monograph (1988) and *Inhalation Toxicology,* 12:5, p. 1-58 (2000).

Certain proposed cigarette-shaped tobacco products purportedly employ tobacco in a form that is not intended to be burned. See, for example, US Pat. Nos. 4,836,225 to Sudoh; 4,972,855 to Kuriyama et al.; and 5,293,883 to Edwards; which are incorporated herein by reference. Yet other types of smoking articles, such as those types of smoking articles that generate flavored vapors by subjecting tobacco or processed tobaccos to heat produced from chemical or electrical heat sources, are described in US Pat. Nos. 4,848,374 to Chard et al.; 4,947,874 to Brooks et al.; 5,060,671 to Counts et al.; 5,146,934 to Deevi et al.; 5,224,498 to Deevi; 5,285,798 to Banerjee et al.; 5,357,984 to Farrier et al.; 5,593,792 to Farrier et al.; 5,369,723 to Counts; 5,692,525 to Counts et al.; 5,865,185 to Collins et al.; 5,878,752 to Adams et al.; 5,880,439 to Deevi et al.; 5,915,387 to Baggett et al.; 5,934,289 to Watkins et al.; 6,033,623 to Deevi et al.; 6,053,176 to Adams et al.; 6,164,287 to White; 6,289,898 to Fournier et al.; 6,615,840 to Fournier et al.; and U.S. Patent Appl. Pub. Nos. 2003/0131859 to Li et al.; 2005/0016549 to Banerjee et al.; and 2006/0185687 to Hearn et al.; each of which is incorporated herein by reference. One type of smoking article that has employed electrical energy to produce heat has been commercially marketed by Philip Morris Inc. under the brand name "Accord."

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Certain attempts have been made to deliver vapors, sprays or aerosols, such as those possessing or incorporating flavors and/or nicotine. See, for example, the types of devices set forth in US Pat. Nos. 4,190,046 to Virag; 4,284,089 to Ray; 4,635,651 to Jacobs; 4,735,217 to Gerth et al.; 4,800,903 to Ray et al.; 5,388,574 to Ingebrethsen et al.; 5,799,663 to Gross et al.; 6,532,965 to Abhulimen et al.; and 6,598,607 to Adiga et al; and EP 1,618,803 to Hon; which are incorporated herein by reference. See also, US Pat. No. 7,117,867 to Cox et al. and the devices set forth on the website, www.e-cig.com, which are incorporated herein by reference.

Smoking articles that employ tobacco substitute materials and smoking articles that employ sources of heat other than burning tobacco cut filler to produce tobacco-flavored vapors or tobacco-flavored visible aerosols have not received widespread commercial success. Thus, it would be highly desirable to provide a smoking article that provides a smoker with an ability to enjoy using tobacco without the necessity of burning any significant amount of tobacco. In particular, it would be highly desirable to provide a tobacco-containing smoking article, such as an article having the general appearance of a cigarette, cigar, or pipe, that possesses the ability to provide to a smoker many of the benefits and advantages of conventional tobacco smoking without necessarily delivering considerable quantities of incomplete combustion and pyrolysis products.

SUMMARY OF THE INVENTION

The present invention relates to smoking articles for providing tobacco enjoyment, as well as manners and methods for providing tobacco enjoyment using such smoking articles. That is, the present invention relates to articles that produce aerosols incorporating components derived from, or provided by, tobacco. Preferred articles produce aerosols that are not necessarily produced as a result of burning of tobacco, but rather, produce an aerosol incorporating components derived from, or provided by, tobacco as a result of the application of heat upon tobacco or materials that are in contact with tobacco. Preferred articles produce visible aerosols that are "smoke-like" in nature, and exhibit many of the sensory characteristics associated with those types of smoking articles that burn tobacco. As a result, the present invention relates to tobacco smoking articles that produce aerosols without experiencing any necessary burning of tobacco or other component materials during periods in which the articles are used. Thus, the present invention relates to smoking articles, and in particular, to smoking

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articles that incorporates tobacco in some form. Of particular interest is generally rod-shaped smoking articles (e.g., a cigarette, a cigarillo, or a cigar), or smoking articles having shapes comparable to other traditional types of smoking products (e.g., pipes).

A preferred smoking article of the present invention, when smoked, is capable of providing mainstream aerosol that may be characterized as being flavorful and satisfying. Highly preferred cigarettes provide certain of the flavors, sensations and satisfaction of popular cigarettes that burn tobacco cut filler, because those preferred cigarettes generate mainstream aerosol, at least in part, by the action of heat upon some form of tobacco.

In one embodiment, the present invention relates to a cigarette that is smoked by coupling that cigarette to an electrically powered aerosol generating device that acts as a holder for that cigarette. The cigarette possesses at least one form of tobacco, and that tobacco is wrapped in a paper wrapper. If desired, various forms of tobacco, or various forms of tobacco containing compositions, can be positioned at specific locations within the cigarette. The cigarette also incorporates aerosol-forming material, and that aerosol-forming material can be an ingredient that is employed in addition to the tobacco. The cigarette may also possess a mouth-end piece that is used by the smoker to inhale components of tobacco, components derived from tobacco, and other components, preferably in the form of a visible aerosol, generated at least in part by the action of heat upon components of that cigarette. A representative device possesses a source of electrical power (e.g., a battery), a controller mechanism including a sensor that is capable of selectively powering certain components of the device (e.g., electrical resistance heating elements) at least during periods of draw, and at least one heating device (e.g., an electrical resistance heating unit) for forming a thermally generated aerosol that incorporates components of tobacco. During use, the cigarette is positioned within the outer housing of the smoking article, and after use, the used cigarette is removed from the smoking article. When desired, another cigarette is positioned within the device for further use.

In another embodiment, the present invention relates to a smoking article that is smoked by incorporating that tobacco within an electrically-powered, aerosol-generating device. At least one form of tobacco can be positioned at one or more specific locations within the cigarette. Aerosol-forming material is employed in addition to the tobacco. A mouth-end piece is used by the smoker to inhale components of tobacco that are generated by the action of heat upon components of that smoking article. A representative smoking article possesses a source of

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electrical power (e.g., a battery), a controller mechanism including a sensor that is capable of selectively powering certain components of the device (e.g., electrical resistance heating elements) at least during periods of draw, and at least one heating device (e.g., an electrical resistance heating unit) for forming a thermally generated aerosol that incorporates components of tobacco. During use, a cartridge containing some form of tobacco is positioned within the smoking article, and after use, the used cartridge is removed from the outer housing of the device. When desired, another cartridge is positioned within the device for further use.

In one preferred embodiment, a tobacco-containing, electrically-powered smoking article is provided, the smoking article comprising:

(a) an outer housing having a mouth-end and an end distal to the mouth-end, wherein the mouth-end comprises an opening adapted for egress of an aerosol generated within the smoking article and the distal end comprises an opening adapted for intake of air into the smoking article;

(b) an electrical power source within the outer housing and operatively positioned downstream of the opening in the distal end of the outer housing such that air entering the smoking article passes the electrical power source;

(c) a first electrical resistance heating element within the outer housing, powered by said electrical power source, and operatively positioned for heating air drawn through the opening in the distal end of the outer housing;

(d) a tobacco material positioned within the outer housing;

(e) an aerosol-forming material positioned within the outer housing in fluid communication with said tobacco material such that air can be drawn through both the tobacco material and the aerosol-forming material;

(f) a second electrical resistance heating element within the outer housing, powered by said electrical power source, and operatively positioned for heating the aerosol-forming material and tobacco material; and

(g) a puff-actuated controller adapted for regulating current flow through at least one of said first and second electrical resistance heating elements during draw, the controller comprising a sensor adapted for sensing draw by the user on the smoking article.

The aerosol-forming material and tobacco can be positioned within a cartridge within the outer housing, the cartridge having an opening facing the second electrical resistance heating element such that aerosol generated within the cartridge initially flows in the direction of the

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second electrical resistance heating element. The cartridge containing the tobacco material and the aerosol-forming material can be positioned between the second resistance heating element and the mouth-end of the outer housing, and the aerosol generated in the cartridge would initially flow in the direction of the second electrical resistance heating element and then flow towards the mouth-end of the outer housing.

In one further embodiment, the tobacco material is in the form of a tobacco rod circumscribed by a wrapping material and positioned between the second resistance heating element and the mouth-end of the outer housing. A cartridge comprising an aerosol-generating material circumscribed by a wrapping material can be positioned between the tobacco rod and the second resistance heating element. Preferably, a filter element is attached to the end of the tobacco rod closest to the mouth-end of the outer housing.

The smoking article can further include, in certain embodiments, a third resistance heating element within the outer housing, powered by the electrical power source, and operatively positioned to heat the tobacco rod. The third heating element can be, for example, a tubular heating element circumscribing all or a portion of the tobacco rod. When a third heating element is present, current through this heating element can also be selectively controlled and regulated by the puff-actuated controller.

In yet another preferred embodiment, a tobacco-containing, electrically-powered smoking article is provided which comprises:

(a) an outer housing having a mouth-end and an end distal to the mouth-end, wherein the mouth-end comprises an opening adapted for egress of an aerosol generated within the smoking article and the distal end comprises an opening adapted for intake of air into the smoking article;

(b) an electrical power source within the outer housing and operatively positioned downstream of the opening in the distal end of the outer housing such that air entering the smoking article passes the electrical power source;

(c) a first electrical resistance heating element within the outer housing, powered by said electrical power source, and operatively positioned for heating air drawn through the opening in the distal end of the outer housing;

(d) a cigarette rod (which is preferably removable so that the rod can be replaced within the smoking article) within the outer housing and comprising a tobacco rod circumscribed by a

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wrapping paper and an adjacent filter element, the cigarette rod being positioned downstream of the second resistance heating element;

(e) an aerosol-forming material positioned within the outer housing in fluid communication with said cigarette rod such that air can be drawn through both the cigarette rod and the aerosol-forming material;

(f) a second electrical resistance heating element within the outer housing, powered by said electrical power source, and operatively positioned for heating the aerosol-forming material and the tobacco rod; and

(g) a puff-actuated controller adapted for regulating current flow through at least one of said first and second electrical resistance heating elements during draw, the controller comprising a sensor adapted for sensing draw by the user on the smoking article.

The aerosol-generating material may be in intimate contact with the tobacco in the tobacco rod, or the smoking article may further include a cartridge comprising the aerosol-generating material circumscribed by a wrapping material, the cartridge positioned between the tobacco rod and the second resistance heating element. In this embodiment also, the device may further include a third resistance heating element within the outer housing, powered by said electrical power source, and operatively positioned to heat the tobacco rod.

In a still further embodiment, the invention provides a tobacco-containing, electrically-powered smoking article comprising:

(a) an outer housing having a mouth-end and an end distal to the mouth-end, wherein the mouth-end comprises an opening adapted for egress of an aerosol generated within the smoking article and the distal end comprises an opening adapted for intake of air into the smoking article;

(b) a mouthpiece through which air can be drawn from the mouth-end of the outer housing, the mouthpiece being removably attached to the outer housing;

(c) an electrical power source within the outer housing and operatively positioned downstream of the opening in the distal end of the outer housing such that air entering the smoking article passes the electrical power source;

(d) a first electrical resistance heating element within the outer housing, powered by said electrical power source, and operatively positioned for heating air drawn through the opening in the distal end of the outer housing;

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(e) a removable carrier device within the outer housing comprising a tobacco material and an aerosol-forming material in fluid communication with the tobacco material such that air can be drawn through both the tobacco material and the aerosol-forming material;

(f) a second electrical resistance heating element within the outer housing, powered by said electrical power source, and operatively positioned for heating the aerosol-forming material and the tobacco material; and

(g) a puff-actuated controller adapted for regulating current flow through at least one of said first and second electrical resistance heating elements during draw, the controller comprising a sensor adapted for sensing draw by the user on the smoking article.

An exemplary removable carrier device is a cigarette rod as described above, the cigarette comprising a tobacco rod circumscribed by a wrapping paper and an adjacent filter element, the cigarette rod being positioned between the second resistance heating element and the removable mouthpiece. Another example of a removable carrier device is a removable cartridge enclosing the aerosol-forming material and tobacco material as described above, the cartridge having an opening facing the second electrical resistance heating element such that aerosol generated within the cartridge initially flows in the direction of the second electrical resistance heating element. The removable carrier device can be heated by a third resistance heating element within the outer housing, the third heating element being powered by the electrical power source.

In any of the above embodiments, at least a portion of the tobacco in the tobacco rod can be in the form of tobacco cut filler, and the cut filler can be in intimate contact with the aerosol-forming material. In certain embodiments, at least a portion of the tobacco in the tobacco rod is in the form of an extract. In any embodiment, at least a portion of the tobacco in the tobacco rod and the aerosol-forming material can be in the form of an intimate mixture, or the two components can be separately-located within the smoking article, such as in separate, adjacent regions in the cigarette rod or in a cartridge. Exemplary aerosol-forming materials include glycerin, propylene glycol, and mixtures thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

In order to assist the understanding of embodiments of the invention, reference will now be made to the appended drawings, which are not necessarily drawn to scale. The drawings are exemplary only, and should not be construed as limiting the invention.

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FIG. 1 through FIG. 3 depict longitudinal cross-sectional views of various embodiments of an electrically powered, tobacco-containing smoking article; and

FIG. 4 and FIG. 5 each are representative schematic diagrams of electronic circuits for smoking articles.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present inventions now will be described more fully hereinafter with reference to the accompanying drawings. The invention may be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather, these embodiments are provided so that this disclosure will satisfy applicable legal requirements. Like numbers refer to like elements throughout. As used in this specification and the claims, the singular forms "a," "an," and "the" include plural referents unless the context clearly dictates otherwise.

A smoking article of the present invention incorporates tobacco. The type of tobacco can vary. One type of tobacco can be employed, or combinations or blends of various types of tobacco can be employed. Furthermore, different types of tobaccos, or different blends of tobaccos, can be employed at different locations within the smoking article.

The tobacco that is employed can include, or can be derived from, tobaccos such as flue-cured tobacco, burley tobacco, Oriental tobacco, Maryland tobacco, dark tobacco, dark-fired tobacco and *Rustica* tobacco, as well as other rare or specialty tobaccos, or blends thereof. See, also, for example, the types of tobaccos set forth in U.S. Pat. Nos. 6,730,832 to Dominguez et al.; and 7,025,066 to Lawson et al.; and US Pat. Appl. Serial No. 60/818,198, filed June 30, 2006, to Stebbins et al.; each of which is incorporated herein by reference. Descriptions of various types of tobaccos, growing practices, harvesting practices and curing practices are set for in *Tobacco Production, Chemistry and Technology,* Davis et al. (Eds.) (1999). Most preferably, the tobacco that is employed has been appropriately cured and aged. Especially preferred techniques and conditions for curing flue-cured tobacco are set forth in Nestor et al., Beitrage Tabakforsch. Int., 20 (2003) 467-475 and U.S. Pat. No. 6,895,974 to Peele, which are incorporated herein by reference. Representative techniques and conditions for air curing tobacco are set forth in Roton et al., Beitrage Tabakforsch. Int., 21 (2005) 305-320 and Staaf et al., Beitrage Tabakforsch. Int., 21 (2005) 321-330, which are incorporated herein by reference.

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The tobacco that is incorporated within the smoking article can be employed in various forms; and combinations of various forms of tobacco can be employed, or different forms of tobacco can be employed at different locations within the smoking article. For example, the tobacco can be employed in the form of cut or shredded pieces of lamina or stem; in a processed form (e.g., reconstituted tobacco sheet, such as pieces of reconstituted tobacco sheet shredded into a cut filer form; films incorporating tobacco components; extruded tobacco parts or pieces; expanded tobacco lamina, such as cut filler that has been volume expanded; pieces of processed tobacco stems comparable to cut filler in size and general appearance; granulated tobacco; foamed tobacco materials; compressed or pelletized tobacco; or the like); as pieces of finely divided tobacco (e.g., tobacco dust, tobacco powder, agglomerated tobacco powders, or the like); or in the form of a tobacco extract. See, for example, US Pat. App. Ser. Nos. 11/194,215 filed August 1, 2005, to Cantrell et al. and 11/377,630 filed March 16, 2006 to Crooks et al.; which are incorporated herein by reference.

The smoking article can employ tobacco in the form of lamina and/or stem. As such, the tobacco can be used in forms, and in manners, that are virtually identical in many regards to those traditionally used for the manufacture of tobacco products, such as cigarettes. Traditionally, cut or shredded pieces of tobacco lamina and stem have been employed as so-called "cut filler" for cigarette manufacture. Pieces of water extracted stems also can be employed. As such, the tobacco in such a form introduces mass and bulk within the smoking article. Manners and methods for curing, de-stemming, aging, moistening, cutting, reordering and handling tobacco that is employed as cut filler will be apparent to those skilled in the art of tobacco product manufacture.

Processed tobaccos that can be incorporated within the smoking article can vary. Exemplary manners and methods for providing reconstituted tobacco sheet, including casting and paper-making techniques, are set forth in US Pat. Nos. 4,674,519 to Keritsis et al.; 4,941,484 to Clapp et al.; 4,987,906 to Young et al.; 4,972,854 to Kiernan et al.; 5,099,864 to Young et al.; 5,143,097 to Sohn et al.; 5,159,942 to Brinkley et al.; 5,322,076 to Brinkley et al.; 5,339,838 to Young et al.; 5,377,698 to Litzinger et al.; 5,501,237 to Young; and 6,216,707 to Kumar; each of which is incorporated herein by reference. Exemplary manners and methods for providing extruded forms of processed tobaccos are set forth in US Pat. Nos. 4,821,749 to Toft et al.; 4,880,018 to Graves, Jr. et al.; 5,072,744 to Luke et al.; 4,874,000 to Tamol et al.; 5,551,450 to

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Hemsley; 5,649,552 to Cho et al.; 5,829,453 to White; 6,125,855 to Nevett et al.; and 6,182,670 to White; each of which is incorporated herein by reference. Extruded tobacco materials can have the forms of cylinders, strands, discs, or the like. Exemplary expanded tobaccos (e.g., puffed tobaccos) can be provided using the types of techniques set forth in US Pat. Nos. Re 32,013 to de la Burde et al.; 3,771,533 to Armstrong et al.; 4,577,646 to Ziehn; 4,962,773 to White; 5,095,922 to Johnson et al.; 5,143,096 to Steinberg; 5,172,707 to Zambelli; 5,249,588 to Brown et al.; 5,687,748 to Conrad; and 5,908,032 to Poindexter; and US Pat. Pub. 2004/0182404 to Poindexter et al.; each of which is incorporated herein by reference. One particularly preferred type of expanded tobacco is dry ice expanded tobacco (DIET). Exemplary forms of processed tobacco stems include cut-rolled stems, cut-rolled-expanded stems, cut-puffed stems and shredded-steam expanded stems. Exemplary manners and methods for providing processed tobacco stems are set forth in US Pat. Nos. 4,195,646 to Kite; 5,873,372 to Honeycutt et al.; each of which is incorporated herein by reference. Manners and methods for employing tobacco dust are set forth in US Pat. Nos. 4,341,228 to Keritsis et al.; 4,611,608 to Vos et al.; 4,706,692 to Gellatly; and 5,724,998 to Gellatly et al.; each of which is incorporated herein by reference. Yet other types of processed tobaccos are of the type set forth in US Pat. Pub. No. 2006/0162733 to McGrath et al.

The tobacco can be used in a blended form. Typically, the blends of various types and forms of tobaccos are provided in a blended cut filler form. For example, certain popular tobacco blends for cigarette manufacture, commonly referred to as "American blends," comprise mixtures of cut or shredded pieces of flue-cured tobacco, burley tobacco and Oriental tobacco; and such blends, in many cases, also contain pieces of processed tobaccos, such as processed tobacco stems, volume expanded tobaccos and/or reconstituted tobaccos. The precise amount of each type or form of tobacco within a tobacco blend used for the manufacture of a particular smoking article can vary, and is a manner of design choice, depending upon factors such as the sensory characteristics (e.g., flavor and aroma) that are desired. See, for example, the types of tobacco blends described in *Tobacco Encyclopedia,* Voges (Ed.) p. 44-45 (1984), Browne, *The Design of Cigarettes,* 3rd Ed., p.43 (1990) and *Tobacco Production, Chemistry and Technology,* Davis et al. (Eds.) p. 346 (1999). See, also, the representative types of tobacco blends set forth in US Pat. Nos. 4,836,224 to Lawson et al.; 4,924,888 to Perfetti et al.; 5,056,537 to Brown et al.; and 5,220,930 to Gentry; U.S. Patent Appl. Pub. Nos. 2004/0255965 to Perfetti et al.; and

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2005/0066986 to Nestor et al.; PCT Appl. Pub. No. WO 02/37990 to Bereman; and Bombick et al., *Fund. Appl. Toxicol.,* 39, p. 11-17 (1997); each of which is incorporated herein by reference.

Certain processed tobaccos can incorporate ingredients other than tobacco. However, it is preferred that processed tobaccos be composed predominantly of tobacco of some form, based on the dry weights of those processed tobaccos. That is, the majority of the dry weight of those processed tobaccos, and the majority of the weight of a mixture incorporating those processed tobaccos (including a blend of materials, or materials having additives applied thereto or otherwise incorporated therein), are provided by tobacco of some form. For example, those materials can be processed tobaccos that incorporate minor amounts of non-tobacco filler materials (e.g., calcium carbonate particles, spongy or absorbent materials, carbonaceous materials including carbon particles and graphite fibers, grains or wood pulp) and/or binding agents (e.g., guar gum, sodium alginate or ammonium alginate); and/or a blend of those materials can incorporate tobacco substitutes or extenders. Exemplary types of tobacco substitutes or extenders are set forth in US Pat. Appl. Serial No. 11/489,334, filed July 19, 2006, to Fagg et al., which is incorporated herein by reference. The foregoing materials, and blends incorporating those materials, frequently include greater than about 70 percent tobacco, often are greater than about 80 percent tobacco, and generally are greater than about 90 percent tobacco, on a dry weight basis, based on the combined weights of the tobacco, non-tobacco filler material, and non-tobacco substitute or extender. However, those processed tobaccos also can be made of virtually all tobacco, and not incorporate any non-tobacco fillers, substitutes or extenders.

The tobacco can be treated with tobacco additives of the type that are traditionally used for the manufacture of tobacco products. Those additives can include the types of materials used to enhance the flavor and aroma of tobaccos used for the production of cigars, cigarettes, pipes, and the like. For example, those additives can include various cigarette casing and/or top dressing components. See, for example, US Pat. Nos. 3,419,015 to Wochnowski; 4,054,145 to Berndt et al.; 4,887,619 to Burcham, Jr. et al.; 5,022,416 to Watson; 5,103,842 to Strang et al.; and 5,711,320 to Martin. Preferred casing materials include water, sugars and syrups (e.g., sucrose, glucose and high fructose corn syrup), humectants (e.g. glycerin or propylene glycol), and flavoring agents (e.g., cocoa and licorice). Those added components also include top dressing materials (e.g., flavoring materials, such as menthol). See, for example, US Pat. No. 4,449,541 to Mays et al. Additives also can be added to the tobacco using the types of

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equipment described in US Pat. No. 4,995,405 to Lettau, or that are available as Menthol Application System MAS from Kohl Maschinenbau GmbH. The selection of particular casing and top dressing components is dependent upon factors such as the sensory characteristics that are desired, and the selection and use of those components will be readily apparent to those skilled in the art of cigarette design and manufacture. See, Gutcho, *Tobacco Flavoring Substances and Methods,* Noyes Data Corp. (1972) and Leffingwell et al., *Tobacco Flavoring for Smoking Products* (1972). The tobacco also may be treated, for example, with ammonia or ammonium hydroxide or otherwise treated to incorporate ammonia (e.g., by addition of ammonia salts such as, for example, diammonium phosphate). Preferably, the amount of ammonia optionally incorporated into the smokable tobacco is less than about 5 percent, and generally about 1 to about 3 percent, based on the dry weight of the tobacco.

Tobacco can be incorporated with the smoking article in a form other than cut filler form. For example, tobacco leaf and/or reconstituted tobacco sheet can be used as a wrapper for a tobacco-containing component having the form of a cigar or an inner wrapper of a double wrapped cigarette rod. Alternatively, processed tobaccos, such as certain types of reconstituted tobaccos, can be employed as longitudinally extending strands. See, for example, the type of configuration set forth in US Pat. No. 5,025,814 to Raker, which is incorporated herein by reference. In addition, certain types of reconstituted tobacco sheets can be formed, rolled or gathered into a desired configuration. In addition, molded, compressed or extruded segments or pieces of tobacco-containing materials that are formed into desired shapes (e.g., strands, tubes, cylinders, pellets, or the like) can be incorporated within the aerosol delivery article. See, for example, US Pat. Nos. 4,836,225 to Sudoh; 4,893,639 to White; 4,972,855 to Kuriyama et al.; and 5,293,883 to Edwards; each of which is incorporated herein by reference. If desired, finely milled tobacco or tobacco dust can be incorporated within other types of processed tobaccos, such as extrudate formulations, reconstituted tobacco sheets, or the like. Furthermore, finely milled tobacco or tobacco dust can be contained on substrates, such as membranes or screens. If desired, at least a portion of the tobacco can be heat treated prior to use within the smoking article (e.g., have the form of high temperature dried, toasted, pre-pyrolyzed, condensed volatiles collected after tobacco is heated, condensed tobacco smoke components, or the like).

At least a portion of the tobacco incorporated with the smoking article can be provided in the form of a tobacco extract. As used herein, the term "tobacco extract" means components

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separated from, removed from, or derived from, tobacco using tobacco extraction processing conditions and techniques. Typically, tobacco extracts are obtained using solvents, such as solvents having an aqueous nature (e.g., water) or organic solvents (e.g., alcohols, such as ethanol or alkanes, such as hexane). As such, extracted tobacco components are removed from tobacco and separated from the unextracted tobacco components; and for extracted tobacco components that are present within a solvent, (i) the solvent can be removed from the extracted tobacco components, or (ii) the mixture of extracted tobacco components and solvent can be used as such. For example, tobacco can be subjected to extraction conditions using water as a solvent; the resulting aqueous extract of tobacco then is separated from the water insoluble pulp; and then (i) the mixture of aqueous extract of tobacco within water can be used as such, or (ii) substantial amounts of the water can be removed from extracted tobacco components (e.g., using spray drying or freeze drying techniques) in order to provide a tobacco extract in powder form. Preferred tobacco extracts incorporate numerous components that are separated from, removed from, or derived from, tobacco; and are not obtained using tobacco extraction processes conditions that are highly selective to a single component (e.g., preferred extracts are not high nicotine content extracts, or extracts that can be characterized as relatively pure nicotine compositions). As such, exemplary preferred tobacco extracts possess less than 45 percent nicotine, often less than 35 percent nicotine, and frequently less than 25 percent nicotine, on the basis of the total extract weight with solvent removed (e.g., on a dry weight basis when the solvent is water). In addition, highly preferred tobacco extracts are highly aromatic and flavorful, and hence introduce desirable sensory characteristics to the aerosol produced by the smoking articles incorporating those extracts. Exemplary types of tobacco extracts, tobacco essences, solvents, tobacco extraction processing conditions and techniques, and tobacco extract collection and isolation procedures, are set forth in Australia Pat. No. 276,250 to Schachner; US Pat. Nos. 2,805,669 to Meriro; 3,316,919 to Green et al.; 3,398,754 to Tughan; 3,424,171 to Rooker; 3,476,118 to Luttich; 4,150,677 to Osborne; 4,131,117 to Kite; 4,506,682 to Muller; 4,986,286 to Roberts et al.; 5,005,593 to Fagg; 5,065,775 to Fagg; 5,060,669 to White et al.; 5,074,319 to White et al.; 5,099,862 to White et al.; 5,121,757 to White et al.; 5,131,415 to Munoz et al.; 5,230,354 to Smith et al.; 5,235,992 to Sensabaugh; 5,243,999 to Smith; 5,301,694 to Raymond; 5,318,050 to Gonzalez-Parra et al.; 5,435,325 to Clapp et al.; and 5,445,169 to Brinkley et al.; each of which is incorporated herein by reference.

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Tobacco extracts typically are carried by a substrate, or are otherwise contained within a carrier or material. The substrate for the tobacco extract can be provided by generally solid substances, such as alumina beads, pieces of carbonaceous materials, paper or paper-type materials (e.g., shredded or gathered pieces of porous paper, papers incorporating tobacco materials such as tobacco stems or stalks, papers incorporating pieces of absorbent carbon particles, or the like), pieces of tobacco lamina and/or stem, pieces of processed tobacco, synthetic fibers, or the like. Alternatively, the tobacco extract can be mixed with generally liquid or fluid substances, such as solvents, aerosol-forming materials, flavor carrying agents, and the like. Mixtures of tobacco extracts and generally liquid or fluid substances, in turn, can be carried by generally solid substrate materials or can be contained within suitable containers, vials, cartridges, or the like.

Various manners and methods for incorporating tobacco into smoking articles, and particularly smoking articles that are designed so as to not purposefully burn virtually all of the tobacco within those smoking articles, are set forth in US Pat. No. 4,947,874 to Brooks et al.; U.S. Patent Application Pub. No. 2005/0016549 to Banerjee et al.; and US Pat. App. Ser. Nos. 11/194,215 filed August 1, 2005, to Cantrell et al. and 11/377,630 filed March 16, 2006 to Crooks et al.; which are incorporated herein by reference. In addition, tobacco has been incorporated with cigarettes that have been marketed commercially under the brand names "Premier" and "Eclipse" by R. J. Reynolds Tobacco Company. See, for example, those types of cigarettes described in *Chemical and Biological Studies on New Cigarette Prototypes that Heat Instead of Burn Tobacco,* R. J. Reynolds Tobacco Company Monograph (1988) and *Inhalation Toxicology,* 12:5, p. 1-58 (2000). Tobacco also has been incorporated within a smoking article that has been marketed commercially by Philip Morris Inc. under the brand name "Accord."

The smoking article of the present invention further includes an aerosol-generating material, which can be in intimate contact with the tobacco material (e.g., in the form of an intimate mixture), or can be carried by a non-tobacco substrate and segregated from the tobacco in the smoking article (e.g., positioned in an adjacent region of the device). The aerosol-generating material is positioned in fluid communication with the tobacco material such that air can be drawing through both the tobacco and the aerosol-generating material, thereby generating an aerosol that includes volatilized portions of the aerosol-generating material and volatilized components derived from the tobacco. The aerosol-forming material can vary, and mixtures of

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various aerosol-forming materials can be used. Representative types of aerosol-forming materials are set forth in US Pat. Nos. 4,793,365 to Sensabaugh, Jr. et al.; and 5,101,839 to Jakob et al.; PCT Appl. Pub. No. WO 98/57556 to Biggs et al.; EPO 1,618,803 to Hon; and *Chemical and Biological Studies on New Cigarette Prototypes that Heat Instead of Burn Tobacco,* R. J. Reynolds Tobacco Company Monograph (1988); which are incorporated herein by reference.

A preferred aerosol-forming material produces a visible aerosol upon the application of sufficient heat thereto, or otherwise through the action of aerosol forming conditions using components of the smoking article. A highly preferred aerosol-forming material produces an aerosol that can be considered to be "smoke-like." A preferred aerosol-forming material is chemically simple, relative to the chemical nature of the smoke produced by burning tobacco. A preferred aerosol-forming material is a polyol; and exemplary preferred aerosol-forming materials include glycerin, propylene glycol, and mixtures thereof. If desired, aerosol-forming materials can be combined with other liquid materials, such as water. For example, aerosol-forming material formulations can incorporate mixtures of glycerin and water, or mixtures of propylene glycol and water. Exemplary aerosol-forming materials also include those types of materials incorporated within devices available through Atlanta Imports Inc., Acworth, Georgia, USA., as an electronic cigar having the brand name E-CIG, which can be employed using associated Smoking Cartridges Type C1a, C2a, C3a, C4a, C1b, C2b, C3b and C4b; and as Ruyan Atomizing Electronic Pipe and Ruyan Atomizing Electronic Cigarette from Ruyan SBT Technology and Development Co., Ltd., Beijing, China.

The aerosol-forming material can be maintained within the smoking article in a variety of ways. For example, the aerosol-forming material can be contained within a container in liquid form, or soaked within absorbent fibrous materials or sponge-like materials. Exemplary absorbent materials can be composed of synthetic polymeric materials, such as fibers of polyethylene terephthalate. Alternatively, the aerosol-forming material can be incorporated within, or carried by, a material that acts as a substrate. For example, the substrate can be, at least in part, a material that incorporates tobacco. Exemplary substrate materials, and exemplary formulations incorporating aerosol-forming materials, are set forth in US Pat. Nos. 4,793,365 to Sensabaugh et al.; 4,893,639 to White; 5,099,861 to Clearman et al.; 5,101,839 to Jakob et al.; 5,105,836 to Gentry et al.; 5,159,942 to Brinkley et al.; 5,203,355 to Clearman et al.; 5,271,419 to Arzonico et al.; 5,327,917 to Lekwauwa et al.; 5,396,911 to Casey, III et al.; 5,533,530 to

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Young et al.; 5,588,446 to Clearman; 5,598,868 to Jakob et al.; and 5,715,844 to Young et al.; and U.S. Patent Application Pub. No. 2005/0066986 to Nestor et al.; which are incorporated herein by reference. See, also, *Chemical and Biological Studies on New Cigarette Prototypes that Heat Instead of Burn Tobacco,* R. J. Reynolds Tobacco Company Monograph (1988). Exemplary substrate materials have been incorporated within the types of cigarettes commercially marketed under the trade names "Premier" and "Eclipse" by R. J. Reynolds Tobacco Company.

The substrate material can incorporate tobacco of some form, normally is composed predominantly of tobacco, and can be provided by virtually all tobacco material. The form of the substrate material can vary; but most preferably that material is employed in an essentially traditional cigarette, cigar or pipe filler form (e.g., as cut filler). The substrate material can be otherwise formed into desired configurations. The substrate material can be used in the form of a gathered web or sheet, using the types of techniques generally set forth in US Pat. No. 4,807,809 to Pryor et al. The substrate material can be used into the form of a web or sheet that is shredded into a plurality of longitudinally extending strands, using the types of techniques generally set forth in US Pat. No. 5,025,814 to Raker. The substrate material can have the form of a loosely rolled sheet, such that a spiral type of air passageway extends longitudinally through the aerosol-generation segment. Representative types of tobacco containing substrate materials can be manufactured from mixtures of tobacco types; or from one predominant type of tobacco (e.g., a cast sheet-type or paper-type reconstituted tobacco composed primarily of burley tobacco, or a cast sheet-type or paper-type reconstituted tobacco composed primarily of Oriental tobacco).

The substrate material also can be treated with tobacco additives of the type that are traditionally used for the manufacture of cigarettes, such as casing and/or top dressing components. The substrate material optionally can be ammoniated (e.g., by treatment with anhydrous ammonia, aqueous ammonium hydroxide, or ammonium salts such as diammonium phosphate). Alternatively those materials can be absent, or virtually absent, of any type of added ammonia (e.g., whether by treatment with anhydrous ammonia, aqueous ammonium hydroxide, or ammonium salts such as diammonium phosphate). Those materials also can be treated with other additives, such as potassium carbonate or sodium bicarbonate. Other materials, such as catalytic agents, nanoparticle compositions, and the like, also can be incorporated within any of

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the smokable materials of the smokable rod. See, for example, the types of components set forth in US Pat. Publication 2004/0173229 to Crooks et al. Preferably, the material is not treated with more that about 10 percent of any of those types of additive agents other than aerosol-forming materials, based on the dry weight of tobacco material within that substrate material.

The manner by which the aerosol-forming material is contacted with the substrate material (e.g., the tobacco) can vary. The aerosol-forming material can be applied to a formed tobacco material, or can be incorporated into processed tobaccos during manufacture of those tobaccos. The aerosol-forming material can be dissolved or dispersed in an aqueous liquid, or other suitable solvent or liquid carrier, and sprayed onto that substrate material. See, for example, U.S. Patent Appl. Pub. No. 2005/0066986 to Nestor et al. The amount of aerosol-forming material employed relative to the dry weight of substrate material can vary. Materials including exceedingly high levels of aerosol-forming material can be difficult to process into cigarette rods using conventional types of automated cigarette manufacturing equipment.

Cast sheet types of processed tobaccos preferably can incorporate relatively high levels aerosol-forming material. Reconstituted tobaccos manufactured using paper-making types of processes preferably can incorporate moderate levels of aerosol-forming material. Tobacco lamina strip and tobacco cut fuller can incorporate lower amounts of aerosol-forming material. For processed materials, such as cast sheet materials and paper-type reconstituted tobaccos, tobacco pulp materials that are extracted with aqueous liquids can be used as components thereof. The removal of some fraction or essentially all of the water soluble components of tobacco can assist in providing a processed material that is capable of acting as an effective substrate for higher levels of aerosol-forming material. In addition, dusting processed tobaccos with dry tobacco powders can assist in providing processed materials having relatively high levels of glycerin while not demonstrating overly tacky or sticky characteristics. Alternatively, relatively high levels of aerosol-forming materials can be applied to, or incorporated within, tobacco substrate materials; and those resulting materials can be considered to be somewhat moist, wet, tacky, sticky or gooey in nature.

Cast sheet processes tobaccos, and particularly cast sheet tobaccos incorporating certain amounts of tobacco pulp that have been extracted with water, often can comprise up to about 65 percent, often up to about 60 percent, and frequently up to about 55 percent, aerosol-forming material, based on the dry weight of the tobacco and aerosol-forming material in the processed

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material so produced. Paper-type reconstituted tobaccos, and particularly those forms of tobacco incorporating certain amounts of tobacco pulp materials that have been extracted with water, and not reapplying some or all of the water soluble extract components back to that pulp, often can comprise up to about 55 percent, often up to about 50 percent, and frequently up to about 45 percent, aerosol-forming material, based on the dry weight of the tobacco and aerosol-forming material in the material so produced. A tobacco material produced by spraying tobacco strip or cut filler with aerosol-forming material often does not comprise more than about 20 percent, and frequently does not comprise more than about 15 percent, aerosol-forming material, based on the dry weight of the tobacco and aerosol-forming material of the material so produced. Materials having relatively high loading levels of aerosol-forming material can be dried (e.g., by being subjected to a flow of hot air) to a moisture content of about 4 percent to about 5 percent, by weight; the dried material then can be processed to form the components of the designed configuration; and then those components can be re-equilibrated to a moisture content of about 12 to about 13 weight percent. Alternatively, those materials can be used in a somewhat moist or wet form.

Other types of materials incorporating relatively high levels of aerosol-forming material can be incorporated in the smoking article. Formed, encapsulated or microencapsulated materials can be employed. Such types of materials preferably include primarily of aerosol-forming material, and those materials most preferably incorporate some amount and form of tobacco. An example of such a type of material is a film produced by casting and drying an aqueous solution of about 65 to about 70 weight parts glycerin, and about 25 to about 30 weight parts binder (e.g., citrus pectin, ammonium alginate, sodium alginate or guar gum), and about 5 weight parts flavoring agent (e.g., vanillin, coffee, tea, cocoa and/or fruit flavor concentrates); and then surface-coating that film with about 2 to about 10 weight parts of a finely divided powder that is provided by milling tobacco lamina.

The amount of aerosol-forming material that is used within the smoking article is such that the cigarette exhibits acceptable sensory and organoleptic properties, and desirable performance characteristics. For example, it is highly preferred that sufficient aerosol-forming material, such as glycerin and/or propylene glycol, be employed in order to provide for the generation of a visible mainstream aerosol that in many regards resembles the appearance of tobacco smoke. Typically, the amount of aerosol-generating material incorporated into the

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smoking article is in the range of less than about 1.5 g, often less than about 1 g, and sometimes less than about 0.5 g. The amount of aerosol-forming material is dependent upon factors such as the number of puffs desired per tobacco-containing cartridge or cigarette incorporated within the smoking article. The amount of aerosol-forming material also can be dependent upon factors such as the position or location of that material relative to the heat-producing components of the smoking article, the ability of that material to wick or transfer to heating regions within the smoking article, the desired concentration of that material in the aerosol generated by the smoking article, and the like.

It is desirable for the aerosol-generating composition not to introduce significant degrees of unacceptable off-taste, filmy mouth-feel, or an overall sensory experience that is significantly different from that of a traditional type of cigarette that generates mainstream smoke by burning tobacco cut filler. The selection of the particular aerosol-generating material and substrate material, the amounts of those components used, and the types of tobacco material used, can be altered in order to control the overall chemical composition of the mainstream aerosol produced by the cigarette.

Other types of flavoring agents, or materials that alter the sensory or organoleptic character or nature of the mainstream aerosol of the smoking article, can be employed. Such flavoring agents can be provided from sources other than tobacco, can be natural or artificial in nature, and can be employed as concentrates or flavor packages. Of particular interest are flavoring agents that are applied to, or incorporated within, those regions of the smoking article where aerosol is generated. Exemplary flavoring agents include vanillin, ethyl vanillin, cream, tea, coffee, fruit (e.g., apple, cherry, strawberry, peach and citrus flavors, including lime and lemon), maple, menthol, mint, peppermint, spearmint, wintergreen, nutmeg, clove, lavender, cardamom, ginger, honey, anise, sage, cinnamon, sandalwood, jasmine, cascarilla, cocoa, licorice; and flavorings and flavor packages of the type and character traditionally used for the flavoring of cigarette, cigar and pipe tobaccos. Syrups, such as high fructose corn syrup, also can be employed. Flavoring agents also can include acidic or basic characteristics (e.g., organic acids, such as levulinic acid). Preferably, such flavoring agents constitute less than about 10 percent, and often less than about 5 percent of the total weight of tobacco, on a dry weight basis. The flavoring agents can be added to the tobacco material or to the aerosol-generating material or both.

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The amount of tobacco incorporated within each smoking article can vary. For certain embodiments, the amount of tobacco cut filler incorporated within each smoking article is at least about 20 mg, generally at least about 50 mg, often at least about 75 mg, and frequently at least 100 mg, on a dry weight basis. For certain embodiments, the amount of tobacco cut filler incorporated within each smoking article does not exceed about 400 mg, generally does not exceed about 350 mg, often does not exceed about 300 mg, and frequently does not exceed about 250 mg, on a dry weight basis. For segments or sections incorporating tobacco cut filler or processed tobacco in cut filler form, the packing density of the material within those segments or sections typically is less than about 400 mg/cm^3, and generally is less than about 350 mg/cm^3; while the packing density of the material within those segments or sections can exceed about 100 mg/cm^3, and often can exceed about 150 mg/cm^3. Preferably, each such segment or section is composed entirely of tobacco and/or processed tobacco. Alternatively, each such segment or section can be composed of tobacco and/or processed tobacco mixed or blended with a non-tobacco substrate material. In either case, the tobacco material, and optional non-tobacco substrate material, can act as a substrate for aerosol-forming materials, flavoring agents, and the like.

The moisture content of the tobacco that is used within the smoking article can vary. Typically, the moisture content of the tobacco exceeds about 12 weight percent, and often can exceed about 15 weight percent. In certain circumstances, moist tobacco can be employed; and that tobacco can have a moisture content in excess of about 20 weight percent, often in excess of about 30 weight percent, and even in excess of about 40 weight percent.

Certain embodiments of the smoking article of the invention incorporate a cigarette rod as a necessary component. That is, the smoking article of the invention can incorporate a tobacco rod wrapped in paper or other wrapping material. The wrapping material used as a wrapper for containing the tobacco, and hence used for cigarette manufacture, can vary. Exemplary types of wrapping materials are set forth in US Pat. Nos. 4,938,238 to Barnes et al. and 5,105,837 to Barnes et al. Wrapping materials, such as those set forth in U.S. Patent Appl. Pub. No. 2005/0005947 to Hampl, Jr. et al. and PCT Appl. Pub. No. WO 2005/039326 to Rasouli et al., can be employed as inner wrapping materials of a so-called "double wrap" configuration. An exemplary type of heat conductive wrapping material is set forth in US Pat. No. 5,551,451 to Riggs et al.; and other suitable wrapping materials are set forth in US Pat. Nos.

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5,065,776 to Lawson et al. and 6,367,481 to Nichols et al.; each of which is incorporated herein by reference. Exemplary wrapping materials, such as laminates of paper and metal foil, and papers used as the outer circumscribing wrapper of the heat generation segment, have been incorporated within the types of cigarettes commercially marketed under the trade names "Premier" and "Eclipse" by R. J. Reynolds Tobacco Company. Other representative wrapping materials, and processed wrapping materials, suitable for use for cigarette manufacture are set forth in US Pat. Nos. 5,220,930 to Gentry; 6,976,493 to Chapman et al.; and 7,047,982 to Seymour et al.; and US Pat. Application Ser. No. 11/377,630 filed March 16, 2006 to Crooks et al.; each of which is incorporated herein by reference. Paper materials can be composed of materials, or treated with films, in order to provide resilience, particularly when the paper material is used to contain tobacco materials that are substrates for relatively high amounts of liquid materials (e.g., aerosol-forming materials). For example, such papers can be treated with coatings of nitrocellulose or ethylcellulose. Alternatively, paper materials can be highly absorbent in nature, and can act as substrates for liquid materials (e.g., aerosol-forming materials, liquid flavoring agents, or mixture of aerosol-forming materials and tobacco extracts).

The tobacco can be wrapped in at least one layer of tobacco lamina and/or reconstituted tobacco sheet. As such, the tobacco that is incorporated within the smoking article is configured in a type of form characteristic of a cigar. Outer wrappers for cigar type tobacco segments or sections can act as substrates for liquid materials (e.g., aerosol-forming materials, liquid flavoring agents, tobacco extracts, or mixtures thereof).

The tobacco can be wrapped in moisture permeable and air permeable pouches, sachets, packets, or the like. For example, finely divided tobacco pieces can be sealed in mesh-type pouches. Suitable pouches are of the type traditionally used for containment of certain types of smokeless tobacco products. See, for example, the types of pouches and types of contents of those pouches that are set forth in US Pat. Appl. Serial Nos. 11/233,399, filed September 22, 2005, to Holton et al.; 11/351,919, filed February 10, 2006, to Holton et al.; and 11/461,633, filed August 1, 2006, to Mua et al.; which are incorporated herein by reference. Such pouches and the contents thereof can act as substrates for significant amounts of aerosol-forming materials, flavoring agents and tobacco extracts. For example, relatively high levels of liquid materials can be applied to, or incorporated within, those substrates; and those resulting materials can be considered to be moist, wet, tacky, sticky or gooey in nature. If desired, those substrates

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can be soaked in liquid mixtures of aerosol-forming material and other components that provide tobacco flavor characteristics to the aerosol produced by the smoking article. The number of such types of pouches that are incorporated within a representative smoking article can vary, and typically can range, for example, from 1 to about 5.

The smoking article typically possesses a mouth-end piece. Representative types of filter elements, such as those employed for cigarettes, including segmented cigarette filter elements, are set forth in US Pat. Appl. Serial No. 11/461,941, filed August 2, 2006, to Nelson et al., which is incorporated herein by reference. Mouth-end pieces also can be fashioned into desired shapes using plastic materials such as nylon, polypropylene, polystyrene, poly(butadiene/styrene/acrylonitrile), or the like.

Representative smoking articles can possesses certain components comparable to, and operate in a manner generally comparable to, that type of device set forth in EPO 1,618,803 to Hon. Representative smoking articles, and exemplary components thereof, also can be provided using components of those nicotine aerosol delivery systems available through Atlanta Imports Inc., Acworth, Georgia, USA., as an electronic cigar having the brand name E-CIG, which can be employed using associated Smoking Cartridges Type C1a, C2a, C3a, C4a, C1b, C2b, C3b and C4b. Exemplary components for representative smoking articles also have been available components of those devices available as Ruyan Atomizing Electronic Pipe and Ruyan Atomizing Electronic Cigarette from Ruyan SBT Technology and Development Co., Ltd., Beijing, China.

Aspects and embodiments of the present invention relating to various smoking articles now are described with reference to the illustrations contained in FIGS. 1-3. Referring to FIG. 1, an embodiment of a representative smoking article 10 is shown. The smoking article 10 has an overall shape that is generally rod-like or tubular in nature, generally akin to a cigarette-type or cigar-type smoking article. The smoking article 10 includes a distal end 13 and a mouth-end 15.

The smoking article 10 possesses an outer container or housing 20. Although the dimensions and shape of the outer container 20 can vary, a representative outer housing is generally tubular in shape (e.g., having an overall length of about 11 cm and an outer diameter of about 1.5 cm). The outer housing 20 can be provided using a variety of materials. For example, the outer housing 20 can be provided from metal (e.g., aluminum or stainless steel), heat-resistant plastic (e.g., polycarbonate), treated paperboard material, or the like. If desired, the

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outer housing can possess an aesthetically pleasing cover (not shown). A representative outer housing can be of the type possessed by the Ruyan Atomizing Electronic Cigarette available from Ruyan SBT Technology and Development Co., Ltd. As shown, the outer housing 20 includes a mouth-end 15 and an end 13 distal to the mouth-end, wherein the mouth-end comprises an opening adapted for egress of an aerosol generated within the smoking article and the distal end comprises an opening adapted for intake of air into the smoking article 10.

The distal end 13 of the outer container 20 of the smoking article 10 can possess an end cover or cap 35. The end cover or cap 35 can be maintained in place by friction fit, a threaded screw mechanism that cooperates with a complementing threaded mechanism 28 that is secured to the distal region of the outer container, or the like. The end cover 35 can act to assist in maintaining various components of the smoking article contained within the outer container. The end cover preferably possesses at least one air passageway 32 to allow drawn air to enter the inner region of the outer container 20. A representative end cover or cap 35 can be of the type possessed by the Ruyan Atomizing Electronic Cigarette available from Ruyan SBT Technology and Development Co., Ltd.

Within the outer container 20 is located an electric power source 36, such as at least one battery. The battery typically is maintained in place by a generally tubular battery holder 40 that is positioned and secured in place within the outer container 20. Typically, at least one longitudinally extending air passageway 45 allows for drawn air to pass by the battery towards the mouth-end 15 of the smoking article 10. As shown, the passageway 45 can be created by incorporation of one or more grooves in the battery holder 40 or, alternatively, by incorporating ribs (not shown) extending into the interior of the battery holder in order to prevent the power source 36 from entering the passageway. The battery holder 40 also can act as a container for relevant electrical wiring (not shown) that passes from the battery to downstream regions of the smoking article 10. Representative types of power sources, and representative arrangements thereof within the outer container, are of the type incorporated within a device available as Ruyan Atomizing Electronic Cigarette from Ruyan SBT Technology and Development Co., Ltd. If desired, higher power electrical power sources can be employed.

The smoking article 10 incorporates various electrically powered control components 50. For a representative embodiment, the control components 50 are positioned within the tubular battery holder 40 in a region downstream from the battery 36. Typically, the electrically-

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powered control components 50 include microchips that provide control of time of operation, control of current, control of electrical resistance heat generation, and the like. Exemplary circuits that can be included in the controller 50 are set forth in FIGS. 4-5. The electrically-powered components 50 are powered by the battery 36. Representative types of electronic control components are of the type can be of the type possessed by the Ruyan Atomizing Electronic Cigarette available from Ruyan SBT Technology and Development Co., Ltd. See, also, the types of electronic systems set forth in US Pat. No. 4,947,874 to Brooks et al.

The representative smoking article 10 incorporates suitably adapted sensing mechanism 60 in order to provide for operation of the electrically powered components during desired periods of time. Representative types of sensing mechanism components are incorporated within a device available as Ruyan Atomizing Electronic Cigarette from Ruyan SBT Technology and Development Co., Ltd. See, also, those types of airflow sensing mechanisms proposed in EPO 1,618,803 to Hon; and US Pat. Nos. 4,735,217 to Gerth et al.; 4,947,874 to Brooks et al.; and 5,388,574 to Ingebrethsen. The sensing mechanism 60 also can be powered by the battery 36. Typically, the sensing mechanism components 60 are positioned within the outer container 20 in a location downstream from the electrically powered control components 50. The sensor 60, in concert with certain control circuitry within the controller 50, is preferably part of a puff-actuated controller adapted for regulating current flow through one or more of the resistance heating elements discussed below. The sensor 60 is preferably adapted for sensing draw (i.e., intake of air from the smoking article) by the user of the smoking article. Representative types of draw sensors are set forth in US Pat. No. 4,947,874 to Brooks et al., wherein pressure sensitive switches are discussed, such as pressure sensitive differential switches available from Micro Pneumatic Logic, Inc. of Ft. Lauderdale, Florida, pressure sensitive transducers, airflow-deflected vanes with motion sensors, and the like. See also, US Pat. No. 7,117,867 to Cox et al. The sensor 60 is configured to allow airflow through or around the sensor. In the embodiment shown, the sensor 60 is configured in an annular shape with a passageway through the center thereof. Other configurations are also possible, such as configurations with multiple passageways through or around the sensor 60.

The representative smoking article 10 also incorporates at least one electrical resistance heating element 70, 72. An optional first resistance heating element 70 can be located upstream from the sensing mechanism 60, and as such, can act to heat drawn air passing through the

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smoking article from the distal end 13 of the outer housing 20. A second resistance heating element 72 can be located downstream from the sensing mechanism 60. The resistance heating elements 70, 72 also can be powered by the battery 36, and control of the operation of those heating elements can be controlled by the electrically powered control components 50. The heating elements 70, 72 are configured to allow airflow therethrough. The heating element 70 upstream of the sensor 60 is configured in the same manner as the sensor (i.e., in an annular shape); however, other configurations are possible as noted above.

Typically, the second resistance element 72 can be formed from relatively high surface area absorbent or wicking-type materials, such as graphite yarn, high surface area metallic cloth or screen, or the like. Resistance elements of such type are useful for supporting or holding sufficient aerosol-forming material for aerosol generation, as well as for wicking additional aerosol-forming material for aerosol generation during subsequent puffs. Alternatively, the second resistance element 72 can be employed in close proximity to an absorbent wicking material such that aerosol-forming material can be wicked or otherwise transferred so as to contact the second resistance element or contact an area in close proximity to the second resistance element (e.g., a region that is exposed to a the heat produced by the second resistance element). Representative types of resistance heating elements are incorporated within a device available as Ruyan Atomizing Electronic Cigarette from Ruyan SBT Technology and Development Co., Ltd. If desired, each of the heating elements 70, 72 can be arranged to have current pass therethrough (and hence provide heat) in response to a signal provided by a puff-actuated controller that regulates current through one or more of the heating elements in response to signals from the sensor 60. For example, each heating element 70, 72 can be turned "on" and "off" in response to a signal provided in response to the sensing mechanism 60 and related control circuitry. Alternatively, current flow through the first heating element 70 can be controlled during periods of normal use of the smoking article 10, and current flow through the second heating element 72 can be controlled only during periods of draw (i.e., the second heating element will be energized when the sensor 60 detects draw by the user).

The representative smoking article 10 of FIG. 1 incorporates a cartridge 85. The cartridge can be manufactured from a variety of materials, such as metal (e.g., aluminum or stainless steel), paper (e.g., paperboard or paper coated with a hydrophobic film or coating), plastic (e.g., polyester, polypropylene, nylon, polycarbonate, or the like). The cartridge 85

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contains tobacco 89 in some form. The cartridge 85 also most preferably contains aerosol-forming material. The tobacco 89 and the aerosol-forming material can be in the form of an intimate mixture or provided in separate regions of the cartridge 85. Representative types of cartridges are of the type incorporated within a device available as Ruyan Atomizing Electronic Cigarette from Ruyan SBT Technology and Development Co., Ltd. can be modified by adding tobacco extract thereto, or by removing at least a portion of the substrate and nicotine-containing material incorporated therein and replacing that removed portion with a tobacco composition. For example, for the embodiment shown in FIG. 1, the cartridge 85 can contain an upstream segment 95 composed of tobacco filler or processed tobacco filler material 89 incorporating aerosol-forming material, and a downstream segment 98 composed of a substrate 101, such as fibers of polyethylene terephthalate carrying flavors and/or aerosol-forming material. The representative smoking article 10 is assembled such that a certain amount of aerosol-forming material and tobacco components can be wicked or otherwise transferred to heating element 72 or the region in close proximity to the heating element. Optionally, as shown, the extreme mouth end region of the cartridge 85 is sealed, and as such, tobacco components and aerosol-forming material have a tendency to travel upstream towards the resistance heater 72. Typically, at least one air passageway 115 extends longitudinally between the inner surface of the outer container 20 and the outer surface of the cartridge 85. This air passageway 115 can be created using the same techniques noted above in connection with the passageway 45 in the batter holder 40.

A representative cartridge 85 is provided by modifying the components of a cartridge employed in a device available as Ruyan Atomizing Electronic Cigarette from Ruyan SBT Technology and Development Co., Ltd. For example, the section or segment of the fibrous substrate and aerosol-forming material is removed from that cartridge and discarded, and that portion is replaced by a section or segment composed of tobacco cut filler saturated with a mixture of glycerin and spray dried tobacco extract. As another example, a web of reconstituted tobacco sheet that is gathered so as to possess a plurality of longitudinally extending passageways can be treated with a mixture of propylene glycol, flavoring agent and tobacco extract. As still another example, the whole section or segment of the fibrous substrate and aerosol-forming material is removed from that cartridge and discarded, and all of that material is replaced by a section or segment composed of aqueous extracted tobacco cut filler pulp saturated or nearly saturated with a mixture of glycerin, flavoring agent and spray dried tobacco extract.

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As a further example, the fibrous substrate and aerosol-forming material can be positioned in the upstream end of the cartridge, and the downstream end of the cartridge can be provided by a plurality of formed tobacco pieces or pellets that act as a substrate for aerosol-forming material and flavoring agent.

The amount of aerosol-forming material, tobacco extract, flavoring agent, and the like that is carried by the substrate can vary; and the weight of those ingredients typically can be as much as at least equal to, often can be at least about twice that, and frequently can be at least about three times that, of the dry weight of the substrate. As such, the cartridge can be adapted to provide components, of types and in amounts, sufficient to provide aerosols demonstrating acceptable visual characteristics, acceptable mouthfeel and other organoleptic effects, acceptable tobacco flavor, and the like.

In a further embodiment, tobacco can be incorporated within a cartridge 85 having the ability to act as a type of liquid storage container of the smoking article. For example, powdered spray dried tobacco extract can be incorporated within the liquid storage container 85, or liquid tobacco extracts or essences can be combined within components contained within the liquid storage container (e.g., aerosol-forming materials) so as to be intimately combined with those components. In another embodiment, pieces of tobacco lamina, stems, or processed tobacco can be incorporated within the liquid storage container 85. For example, pieces of tobacco lamina cut filler, tobacco dust, or pieces of reconstituted tobacco sheet, can be incorporated within the liquid storage container. As such, the tobacco can be mixed with, or be part of, the aerosol-forming mixture within the cartridge 85. Most preferably, essentially pure nicotine, extracts composed predominantly of nicotine, or formulations composed predominantly of nicotine, are not incorporated within the liquid storage container 85 or elsewhere within the smoking article.

In another embodiment, the tobacco can be located within the smoking article 10 in a region that is physically separate from the cartridge 85. For example, the tobacco can be positioned so as to abut the cartridge 85, or positioned in a spaced apart relationship relative to the cartridge. As such, the tobacco is not mixed with the aerosol-forming mixture within the cartridge 85. In one embodiment, a charge or roll of tobacco cut filler wrapped in paper (e.g., so as to provide a generally cylindrical charge of tobacco) can be positioned either upstream or downstream from the cartridge 85. In another embodiment, tobacco-containing reconstituted tobacco sheet (e.g., a formed cast sheet or reconstituted tobacco paper) can be used as wrapping

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materials of various components (e.g., including the cartridge 85) within the smoking article 10. In another embodiment, tobacco cut filler can surround the cartridge 85 or other components located within the smoking article 10. In another embodiment, tobacco extract can be carried by a substrate or positioned within a cartridge that is located within the smoking article 10 physically separate from the aforementioned cartridge 85 that contains the aerosol-forming material.

The number of puffs during the use of a single cartridge 85 can vary, depending upon factors such as the amount of aerosol-forming material, tobacco, and other associated components that is employed, the form of those components, the positioning of those components within the smoking article 10 relative to the resistance heating elements, and the like. The amount of those components can be sufficient to provide, for example, about 10 to about 15 puffs per cartridge, when that cartridge is employed within a smoking article and smoked under FTC smoking conditions. However, amount of those components can be sufficient to provide, for example, greater than about 200 puffs per cartridge, often greater than about 400 puffs per cartridge, and frequently greater than about 600 puffs per cartridge, when that cartridge is employed within a smoking article and smoked under FTC smoking conditions. For smoking articles employing cartridges containing sufficient components to provide a relatively large number of puffs, those smoking articles can be employed in conjunction with removable caps, or other suitable sealing means, in order that the smoking article can be sealed during periods of non-use. The smoking article 10 can be configured such that the cartridge 85 can be removed from the smoking article and replaced as needed.

The smoking article 10, at its mouth-end 15, possesses a mouth-end piece 120. The mouth-end piece 120, which is typically removable, can be maintained in place by friction fit, a threaded screw mechanism that cooperates with a complementing threaded mechanism that is secured to the outer container, or the like. A representative mouth-end piece can be of the type incorporated within a device available as Ruyan Atomizing Electronic Cigarette from Ruyan SBT Technology and Development Co., Ltd. Alternatively, the mouth-end piece 120 can have the form of other types of holders that have been proposed for use with smoking articles. See, also, for example, the types of mouth-end pieces and cigarette-type filter elements set forth in US Pat. Appl. Serial No. 11/377,630 filed March 16, 2006 to Crooks et al.

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During use, the mouth-end 15 of the smoking article 10 is placed in the lips of the smoker. Air is drawn through the air passageways or openings 32 in the cap 35 located at the distal end 13 of the smoking article, and into the outer container 20. Drawn air passes through air passageway 45 that extends along the length of the power source 36 and the electronic control components 50, through an air passageway area within the first heating element 70, through the air flow sensing region 60, past or through the second heating element 72, through air passageway 115 that extends along the length of the cartridge 85, and into the mouth-end piece 120. Typically, resistance heating elements provide surface region temperatures, and hence the ability to heat aerosol-forming materials and tobacco materials in surrounding regions in the vicinity of those heating elements. Typically, during relevant periods of use, those heating elements can provide surface region temperatures of at least about 200°C, and often at least about 300°C. Typically, those temperatures do not exceed about 600°C, often do not exceed about 500°C, and frequently do not exceed about 400°C. Aerosol that is formed by the action of drawn air passing heated tobacco components and aerosol-forming material in the region occupied by the second heating element 72 is drawn through the mouth-end piece 120, and into the mouth of the smoker. That is, when used, the smoking article 10 yields visible mainstream aerosol that preferably resembles the mainstream tobacco smoke of traditional cigarettes that burn tobacco cut filler. The aerosol may also contain flavors and other components provided by, or derived from, tobacco.

Referring to FIG. 2, another embodiment of a representative smoking article 10 is shown. The smoking article 10 has a rod-like shape, and includes a distal end 13 and a mouth-end 15. The smoking article 10 possesses certain components comparable to, and in certain regards operates in a manner generally comparable to, that smoking article described previously with reference to FIG. 1. However, the smoking article is adapted to incorporate a cigarette 150.

An exemplary type of cigarette 150 possesses a charge or roll of tobacco 89 (e.g., tobacco cut filler or processed tobacco material) wrapped in wrapping material 160 (e.g., paper). The length of the resulting tobacco rod can vary; with a typical tobacco rod having a length of at least about 30 mm, often at least about 40 mm, while a typical tobacco rod has a length that does not exceed about 60 mm, and often does not exceed about 50 mm. The circumference of the tobacco rod can vary; with a typical tobacco rod having a circumference of about 20 mm to about 35 mm, and often about 25 mm to about 30 mm. Depending upon factors such as the ingredients

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incorporated within the cigarette 150, the number of puffs of aerosol per cigarette than are expected, the configuration of the holder into which the cigarette is inserted, the amount of heat generated by the resistance heating element, and the like, the physical dimensions of the cigarette can be smaller than those of conventional, commercially available cigarettes that burn tobacco.

Typically, the wrapping material 160 is wrapped around the tobacco 89 so as to form a generally cylindrical rod-shaped cigarette rod or tobacco rod. That is, the wrapping material 160 is formed into a generally tubular shape, and the tobacco is positioned within the hollow region within that tube. Preferably, the wrapping material 160 is formed such that each end of the tobacco rod is open to expose the tobacco contained therein, and to allow the passage of drawn air therethrough.

The wrapping material 160 can vary. The wrapping material 160 can be a paper wrapping material of the type traditionally used for cigarette manufacture. The wrapping material 160 also can be composed of a laminate of metallic foil and paper, and as such, heat generated by the second heating element can heat the metallic foil of the laminate and hence heat the tobacco contained within that laminate. See, for example, the types of wrapping materials, wrapping material laminates and wrapping material configurations set forth US Pat. Appl. Ser. No. 11/377,630 filed March 16, 2006 to Crooks et al.

For the embodiment shown, the cigarette 150 possesses a type of cartridge 85 at its distal end within the wrapping material 160 and in fluid communication with the tobacco rod. That optional cartridge 85 contains an aerosol-generating material composition 101 therein. The components of the composition 101 can include a substrate material (e.g., polyethylene terephthalate fibers) that can be mixed or blended with tobacco filler. Typically, the substrate materials act as carriers for tobacco components and other aerosol-forming materials that can be delivered to the mouth of the smoker. The cartridge 85 can have a generally tubular shape with open ends such that air may flow therethrough. Cartridges can be manufactured from a variety of materials, such as paper or plastic, or heat conductive materials (e.g., metal foil, metal mesh or screen, ceramic non-woven web, or the like). Typically, when present, the length of the cartridge 85 does not exceed about 30 mm, and often does not exceed about 20 mm. Typically, when present, the cartridge 85 has a length of at least about 5 mm, and often at least about 10 mm. Optionally, an air passageway or gap (not shown) can exist downstream from the cartridge 85, or the cartridge 85 can abut the tobacco rod as shown in FIG. 2 such that some migration of

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material between the tobacco rod and the cartridge is possible. Such an air passageway, when present, typically has a length of up to about 10 mm.

In one embodiment, the cartridge 85 and/or the wrapping material 160 of the tobacco rod can be manufactured from materials that, to some degree, conduct electricity. As such, depending upon the positioning of the cigarette 150 within the smoking article 10, the cartridge 85 and/or the wrapping material 160 can be in electrical contact with the electrical circuitry associated with the electrical resistance heating element 72. As a result, it is possible that some degree of electrical resistance heating also can be provided by the cartridge 85 and/or the wrapping material 160.

In one embodiment, the cartridge 85 can be virtually devoid or free of nicotine. For example, the cartridge 85 can contain aerosol-forming materials, non-tobacco flavoring agents, and optionally, tobacco (e.g., as pieces of tobacco or as an extract) that has been de-nicotinized (e.g., using de-nicotinization processes or by using tobaccos virtually devoid of nicotine). As such, visible aerosol or flavored visible aerosol that is produced solely using components incorporated within the container 85 possesses virtually no nicotine. Rather, nicotine provided to the smoker of the smoking article within the mainstream aerosol delivered by the smoking article is provided by action upon tobacco 89 located in another region of the smoking article 10 rather than from nicotine incorporation within the cartridge 85.

In one embodiment, the cartridge 85 can contain a gathered web of paper that incorporates carbon particles (e.g., about 10 to about 60 weight parts carbon and about 40 to about 90 weight parts wood pulp or flax fiber). See, for example, the types of carbon-containing papers set forth in US Pat. No. 5,360,023 to Blakley et al., which is incorporated herein by reference. For example, a gathered sheet of carbon paper weighing about 40 mg, and having a length of about 10 mm to about 20 mm, can be saturated with a liquid mixture of glycerin, tobacco extract, and flavoring agent (e.g., with about 40 mg to about 120 mg of liquid mixture).

In a further embodiment, the cartridge 85 can contain a gathered web of paper that incorporates calcium carbonate particles (e.g., about 10 to about 40 weight parts calcium carbonate and about 60 to about 90 weight parts wood pulp or flax fiber). For example, a gathered sheet of carbon paper weighing about 40 mg, and having a length of about 10 mm to about 20 mm, can be saturated with a liquid mixture of glycerin, tobacco extract, and flavoring agent (e.g., with about 40 mg to about 100 mg of liquid mixture).

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In yet another embodiment, the cartridge 85 can contain a fibrous carbonaceous material (e.g., graphite fibers). For example, a segment formed from about 40 mg to about 100 mg of those fibers, and having a length of about 10 mm to about 20 mm, can be saturated with a liquid mixture of glycerin, tobacco extract, and flavoring agent (e.g., in an amount of about 3 times of the dry weight of those fibers).

In a still further embodiment, the cartridge 85 can contain a reconstituted tobacco material (e.g., a cast sheet type material, an extruded material, or a paper-type reconstituted tobacco material) that incorporates particles or pieces of highly heat conductive materials (e.g., a matrix of aluminum wires, aluminum foil, copper wire, copper tubing, metal beads, or the like). Representative pieces or beads can have lengths, thicknesses or diameters of about 0.01 micrometers to about 1 mm. That material can act as a substrate for aerosol-forming material, tobacco extract, flavoring agents, and the like, and also can act as a conductor of heat produced by electrical resistance heating to regions within the cigarette 150.

If desired, the region of the cigarette 150 that is wrapped in the paper wrapper 160 can be composed entirely of tobacco material, processed tobacco material, or a blend of tobacco material and other substrate material, and those materials is treated in such a manner so as to act as substrates for aerosol-forming materials. For such an embodiment, the previously described cartridge 85 is not incorporated within the cigarette 150, and the components contained within the wrapping material 160 are not necessarily positioned or arranged therein in a segmented fashion.

The cigarette 150 also can possess an optional filter element 200 located at the downstream end of the tobacco rod. The filter element can be composed of filter material 215 (e.g., cellulose acetate tow, gathered polypropylene web, plasticized cellulose acetate tube, or the like) wrapped in circumscribing plug wrap 218. The filter element can be attached to the tobacco rod using a tipping material 222 that circumscribes the length of the filter element 200 and an adjacent region of the tobacco rod.

The mouth-end piece 120 of the smoking article 10 can be adapted to act as a support for the filter element 200 of the cigarette 150, and can be removably attached to the outer housing 20 of the smoking article. That is, the mouth-end piece 120 can be removed from the outer housing 20 of the smoking article 10, the filter element 200 of the cigarette 150 can be secured within the mouth-end piece (e.g., by friction fit), and the cigarette can be inserted into the downstream end

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of the outer housing. In such a circumstance, the mouth-end piece 120 can have a generally tubular shape. As such, the mouth-end piece can act as a type of support for the cigarette 120 while that cigarette is positioned within the outer housing 20 for use.

During use, the mouth-end 15 of the smoking article 10 is placed in the lips of the smoker. Air is drawn through the through the air passageways or openings 32 in the cap 35 located at the distal end 13 of the smoking article, and into the outer container 20. Draw air passages through air passageway 45 that extends along the length of the power source 36 and the electronic control components 50, through an air passageway area within the first optional heating element 70, through the air flow sensing region 60, past or through the second heating element 72, through the cigarette 150 (including through cartridge 85), and into the mouth-end piece 120. Heat generated by the heating elements acting upon the tobacco and components thereof acts to volatilize components of the tobacco or otherwise cause components of tobacco to be entrained in drawn air. As such, the resulting aerosol incorporating tobacco components or tobacco-derived components is drawn into the mouth of the smoker. After use, the spent cigarette 150 is removed from the outer container 20 and disposed of, and when desired, a new cigarette is replaced within the outer container.

Referring to FIG. 3, yet another embodiment of a representative smoking article 10 is shown. The smoking article possesses a distal end 13 and a mouth-end 15. The smoking article 10 possesses certain components comparable to, and in certain regards operates in a manner generally comparable to, that smoking article described previously with reference to FIG. 1. The smoking article 10 is adapted to incorporate a type of cigarette 150. The tobacco segment 89, circumscribed with a wrapping material 160, can be provided so as to provide tobacco components or tobacco derived components by the action of heat. Components of the tobacco segment 89 can be treated (e.g., by contact with metal salts, moisture, or other suitable materials) in order that the tobacco (e.g., as cut filler, reconstituted tobacco sheet, or the like) that is subjected to heating by the action of the electrically generated heat exhibits desirable heat resistance, does not burn to an undesirable extent, experiences a controlled smolder, or the like. The tobacco segment 89 can also incorporate an aerosol-generating material. As shown, the cigarette 150 may include a filter element 200 as noted in connection with FIG. 2.

The smoking article 10 possesses a third optional resistance heating element 300 that is powered by the power source 36. The third resistance heating element is operated in essentially

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the same manner as the first and second resistance heating elements 70, 72 that have been described previously with reference to FIG. 1. As such, the third resistance heating element 300 is powered by the power source 36 and controlled by the electrically powered control components 50, through suitable electrical connections, such as conductive wires, or the like (not shown). The third resistance heating element 300 can be provided by a suitable conductive material that can be suitably used as a resistance heating element, such as non-woven graphite yarn or web, ceramic material, metallic cloth or screen, metal alloy sheet, or the like. The physical size and shape of the third resistance heating element is such that the heating element can provide heat to at least a portion of the tobacco 89 of the cigarette 150. For example, the third resistance heating element 300 can have the general shape of a tube that is adapted to fit snuggly around a portion of a tobacco rod 89 inserted therein. Alternatively, the third resistance heating element 300 can have a form so that aerosol-forming material and extracted tobacco components can be wicked from a tobacco substrate or a substrate paper material that is wrapped around that tobacco 89. If desired, at least one of the resistance heating elements (e.g., the first and/or third resistance elements) can be equipped with a separate on/off timing mechanisms and/or switching mechanisms in order that the cigarette 150 can be pre-heated or heating can be otherwise controlled during certain desired periods of use of the smoking article 10. In other words, each heating element can be selectively and separately controlled in certain embodiments. If desired, each of the heating elements can be arranged to have current pass therethrough (and hence provide heat) in response to a signal provided by response to the sensing mechanism component 60. For example, each heating element can be turned "on" and "off" in response to a signal provided by response to the sensing mechanism 60. Alternatively, current flow through the first heating element 70 can be controlled during periods of normal use of the smoking article 10, and current flow through the second heating element 72 can be controlled only during periods of draw. Thus, each resistance heating element can provide differing amounts of heat, and can be operated to provide heat during differing periods.

Optionally, the size and shape of the second resistance heating element 72 can be altered. For example, as shown in FIG. 3, at least a portion of the second resistance heating element can be elongated, and at least a portion thereof can extend downstream within the outer container 20. As such, at least a portion of the second resistance heating element can extend into the tobacco

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segment 89, and hence be in close contact with a significant amount of substrate and aerosol-forming material within the tobacco.

Preferably, a thermally insulated region 400 circumscribes the resistance heating element 300 of the smoking article 10 as shown, although the insulation can extend further down the smoking article and circumscribe, for example, the first and second heating elements as well. Representative types and configurations of insulation are set forth in US Pat. Appl. Ser. Nos. 11/194,215 filed August 1, 2005, to Cantrell et al. and 11/377,630 filed March 16, 2006 to Crooks et al. As such, there is provided a way to prevent the outer regions of the outer container 20 from becoming unduly hot to the touch during use of the smoking article 10. In addition, a series of substantially non-permeable walls or like structural regions 420 can assist in ensuring that drawn air has a tendency to pass through the tobacco 89 during use of the smoking article 10. The insulating material 400 also can be positioned elsewhere within the smoking article 10. For example, insulating material 400 can be used as a substrate material for tobacco extract, tobacco dust, aerosol-forming material, flavoring agent, and the like. In addition, insulating material 400 can be positioned at the locations or regions near the distal end 13 of the smoking article 10, around the power source 36, around the electronic and/or puff control components of the smoking article 10, or elsewhere.

During use, the mouth-end 15 of the smoking article 10 is placed in the lips of the smoker. Air is drawn through the air passageways or openings 32 in the cap 35 located at the distal end 13 of the smoking article, and into the outer container 20. Draw air passages through air passageway 45 that extends along the length of the power source 36 and the electronic control components 50, through an air passageway area within the first heating element 70, through the air flow sensing region 60, past or through the second heating element 72, through the cigarette 150, and into the mouth-end piece 120. Heat generated by the three heating elements 70, 72, 300 acting upon the tobacco and components thereof act to volatilize components of the tobacco or otherwise cause components of tobacco to be entrained in drawn air. Typically, resistance heating elements provide surface region temperatures, and hence the ability to heat aerosol-forming materials and tobacco materials in surrounding regions in the vicinity of those heating elements. Typically, during relevant periods of use, those heating elements can provide surface region temperatures of at least about 200°C, and often at least about 300°C. Those temperatures typically do not exceed about 600°C, often do not exceed about 500°C, and frequently do not

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exceed about 400°C. As such, the resulting aerosol incorporating tobacco components or tobacco derived components is drawn into the mouth of the smoker. After use, the spent cigarette 150 is removed from the outer container 20 and disposed of, and when desired, a new cigarette is replaced within the outer container. Removal of the cigarette 150 can be accomplished by removing the mouthpiece 120, which is typically removably attached to the outer housing 20.

For all the embodiments described above, the selection of battery and resistance heating elements can vary, and can be a matter of design choice. For example, the battery voltage, amount of electrical current and resistance provided by the various resistance heating elements can be selected to provide sufficient power for initial heating (e.g., sufficient to provide virtually immediate aerosol formation and delivery of tobacco derived components upon draw), adequate heating of relevant components within the smoking article (i.e., sufficient heat to generate aerosol formation), adequate power source lifetime, and the like. Typically, the various components of the various control circuitry acts to ensure that current is controlled in order that resistance heating heats relevant components to a desired temperature or within a desired temperature range (i.e., a preferred smoking article does not overheat). Selection of the power source and resistance heating elements can be a matter of design choice, and will be readily apparent to one skilled in the art of design and manufacture of electrical resistance heating systems.

If desired, the smoking articles 10 of the present invention optionally can be air diluted. For smoking articles 10 that optionally are air diluted or ventilated, the amount or degree of air dilution or ventilation can vary. Frequently, the amount of air dilution for an air diluted cigarette is greater than about 10 percent, generally is greater than about 20 percent, often is greater than about 30 percent, and sometimes is greater than about 40 percent. Preferably, the upper level for air dilution for an air diluted cigarette is less than about 80 percent, and often is less than about 70 percent. As used herein, the term "air dilution" is the ratio (expressed as a percentage) of the volume of air drawn through the air dilution means to the total volume and air and aerosol drawn through the cigarette and exiting the mouth end portion of the cigarette. Higher air dilution levels can act to reduce the transfer efficiency of aerosol-forming material into mainstream aerosol.

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Preferred smoking articles 10 of the present invention exhibit desirable resistance to draw. For example, an exemplary smoking article exhibits a pressure drop of between about 50 and about 200 mm water pressure drop at 17.5 cc/sec. air flow. Preferred smoking articles exhibit pressure drop values of between about 60 mm and about 180, more preferably between about 70 mm to about 150 mm, water pressure drop at 17.5 cc/sec. air flow. Preferably, pressure drop values of smoking articles are measured using a Filtrona Cigarette Test Station (CTS Series) available form Filtrona Instruments and Automation Ltd.

Aerosols that are produced by smoking articles of the present invention are those that comprise air-containing components such as vapors, gases, suspended particulates, and the like. Aerosol components can be generated by the action of heat upon tobacco of some form; and in certain circumstances, by thermally decomposing tobacco caused by heating tobacco, smoldering tobacco, and charring tobacco; and by vaporizing aerosol-forming agent. As such, the aerosol can contain volatilized components, combustion products (e.g., carbon dioxide and water), incomplete combustion products, and products of pyrolysis. Aerosol components may also be generated by the action of heat from burning tobacco of some form (and optionally other components that are burned to generate heat), upon substances that are located in a heat exchange relationship with tobacco material that is burned and other components that are burned. Aerosol components may also be generated by the aerosol generation system as a result of the action of heat of the heat generation system. Most preferably, components resulting from the aerosol generation system have an overall composition, and are positioned within the smoking article, such that those components have a tendency not to undergo a significant degree of thermal decomposition (e.g., as a result of combustion, smoldering or pyrolysis) during conditions of normal use.

Referring to FIG. 4, there is shown a diagram of an embodiment of an electronic circuit 500 that can be incorporated within a smoking article of the present invention. The control circuitry for the smoking articles of the invention can be assembled as discrete electronic components or functionally as an integrated microprocessor device. The representative circuit includes a power source 36, an actuation mechanism 510 (e.g., an actuation switch), and at least one resistance heating element; and for the embodiment shown, a first resistance heating element 70, a second resistance heating element 72, and a third resistance heating element 300. Such a circuit that incorporates three resistance heating elements can be incorporated within the type of

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smoking article described previously with reference to FIG. 3. It is noted that the circuit 500 of FIG. 4 can be readily adapted for use in a smoking article comprising two heating elements by simply removing the circuit pathways involving heating element 300, and thus would be suitable for use in the embodiments of FIGS. 1 and 2.

The actuation mechanism 510 typically is a switching mechanism that can be engaged by activity of the smoker. That is, such a switch can be activated by pressing or other type of movement by the smoker using his/her finger, by activation by contact with the lips of the smoker, or by at least one other type of sensing mechanism located at an appropriate location on the smoking article. A representative switch can be manually operated by the smoker.

The circuit preferably incorporates a timing mechanism 520. Such a timing mechanism can be programmed to provide for a controlled period of operation. For example, after the circuit has been activated by activity resulting in the switching of the current actuation mechanism 510 to an "on" position, the timing mechanism operates for a selected period of time (e.g., 1 minute, 2 minutes, 4 minutes, or the like). In the event that the remaining portion of the circuit is reactivated within the selected period of time, the timing mechanism 520 is reset and begins operating again. In the event of the occurrence a certain period of inactivity or non-use, the timing mechanism then can act to turn the circuit "off," until reactivation of the cycle.

During operation of the circuit, current passes through the first resistance heating element 70 and the third resistance heating element 300, and as such, those resistance heating elements produce heat. Control of the temperatures generated by each resistance heating element is provided by control mechanisms 530, 540, respectively.

A puff control mechanism 550, such as a suitable air flow sensing switch, acts to complete the circuit that provides current to the second resistance heating element 72. That is, during periods of draw, the circuit that provides current through the second resistance heating element is closed, and hence that heating element produces heat. A predetermined quantity of heat can be produced by current controlled by a timer (e.g., a fixed pulse set at about 0.5 second to about 2 seconds in duration). Alternatively, a series of "on/off" types of pulses can be provided during draw periods. When draw is complete, that circuit is broken. A control mechanism 560, such as a timer, acts to provide for control of the current passing through the circuit, and hence the amount of heat generated by heating element. For example, for longer puff periods, current supplied to the heating element, and hence power for aerosol generation, can be

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provided by a controlled sequential "on" and "off" signal provided by the timer. Typically, the timed period for current flow ranges from about 0.1 second to about 1 second, and about 0.2 second to about 0.6 second generally can be employed; while the "off" period for between periods of periodic current flow often can range from about 0.1 second to about 0.6 second.

Referring to FIG. 5, there is shown a diagram of another embodiment of an electronic circuit 500 that can be incorporated within a smoking article of the present invention. It is again noted that the control circuitry for the smoking articles of the invention can be assembled as discrete electronic components or as an integrated microprocessor device. The representative circuit includes a power source 36, an actuation mechanism 510, and at least one resistance heating element; and for the embodiment shown, a first resistance heating element 70, a second resistance heating element 72, and a third resistance heating element 300. Such a circuit that incorporates three resistance heating elements can be incorporated within the type of smoking article described previously with reference to FIG. 3. Again, simply removing the third heating element 300 could produce a circuit useful in other smoking article embodiments set forth herein.

The circuit preferably incorporates a timing mechanism 520. Such a timing mechanism can be programmed to provide for a controlled period of operation. For example, after the circuit has been activated by activity resulting in the switching of the current actuation mechanism 510 to an "on" position, the timing mechanism operates for a selected period of time. In the event that the remaining portion of the circuit is activated, the timing mechanism is reset and begins operating again. In the event of the occurrence a certain period of inactivity or non-use, the timing mechanism then can act to turn the circuit "off."

During operation, current passes through the first resistance heating element 70 and the third resistance heating element 300, and as such, those resistance heating elements produce heat. Control of the temperatures generated by each resistance heating element is provided by control mechanisms 530, 540, respectively.

A puff control mechanism 590 acts to complete the circuit that provides current to the second resistance heating element 72. That is, during periods of draw, the circuit that provides current through the second resistance heating element is closed, and hence that heating element produces heat. When draw is complete, that circuit is broken. In the embodiment shown, the puff control mechanism 590 is provided by a pressure sensor 570 and a threshold detector 580

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(e.g., a Schmitt trigger), which can provide for control of the current passing through the second resistance heating element 72, and hence for heat generation by heating element 72 that is proportional to the period and magnitude of the draw. For example, for longer puff periods, current supplied to the heating element 72, and hence power for aerosol generation, can be provided for longer periods of time. As another example, for deeper or more rigorous puffs, a sensing of stronger draw can be used to provide for greater current flow to the appropriate resistance heating element, and hence provide for a correspondingly greater aerosol generation. Alternatively, a separate switch (not shown) can be selected by the smoker to provide control of current to at least one of the resistance heating elements; and as such, during periods of draw (e.g., whether or not the draw or puff is intense, long, short, deep, shallow, large in volume, small in volume, or the like) the conditions associated with heat generation for aerosol formation are controlled, and hence, consistent aerosol formation can be provided during each puff.

Many modifications and other embodiments of the invention will come to mind to one skilled in the art to which this invention pertains having the benefit of the teachings presented in the foregoing description; and it will be apparent to those skilled in the art that variations and modifications of the present invention can be made without departing from the scope or spirit of the invention. Therefore, it is to be understood that the invention is not to be limited to the specific embodiments disclosed and that modifications and other embodiments are intended to be included within the scope of the appended claims. Although specific terms are employed herein, they are used in a generic and descriptive sense only and not for purposes of limitation.

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What is claimed is:

1. A tobacco-containing, electrically-powered smoking article comprising:

(a) a tubular outer housing having a mouth-end and an end distal to the mouth-end, the housing comprising an opening adapted for intake of air into the smoking article;

(b) an electrical power source within the outer housing;

(c) at least one electrical resistance heater within the outer housing, the heater being configured to allow air flow therethrough and being powered by said electrical power source;

(d) a controller adapted for regulating current flow through the heater; and

(e) a rod-shaped carrier device removably engaged with the mouth-end of the outer housing and comprising a tubular mouth-end piece and a tubular cartridge with two open ends allowing air to flow therethrough, wherein the cartridge includes a substrate that comprises a tobacco material and an aerosol-generating material, wherein the cartridge is operatively positioned within the outer housing and adjacent to the heater such that the electrical resistance heater is adapted for heating at least a portion of the tobacco and the aerosol-generating material and such that air drawn into the outer housing passes through at least a portion of the heater, through the cartridge, and through the mouth-end piece.

2. The smoking article of claim 1, wherein the aerosol-forming material comprises glycerin, propylene glycol, or a mixture thereof.

3. The smoking article of claim 1, wherein the substrate comprises an absorbent material.

4. The smoking article of claim 3, wherein the absorbent material comprises a paper material.

5. The smoking article of claim 3, wherein the absorbent material comprises a paper-type reconstituted tobacco.

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6. The smoking article of claim 1, wherein the substrate comprises a paper material with a tobacco extract and the aerosol-generating material absorbed thereon.

7. The smoking article of Claim 1, wherein the substrate comprises polyethylene terephthalate fibers.

8. The smoking article of claim 7, wherein polyethylene terephthalate fibers are blended with tobacco cut filler.

9. The smoking article of claim 1, wherein the substrate further comprises a flavoring agent.

10. The smoking article of claim 1, wherein the substrate further comprises carbon particles or calcium carbonate particles therein.

11. The smoking article of claim 1, wherein the substrate further comprises a fibrous carbonaceous material.

12. The smoking article of claim 1, wherein the substrate is a laminate of metallic foil and paper.

13. The smoking article of claim 12, wherein the paper comprises reconstituted tobacco.

14. The smoking article of claim 12, wherein the paper includes a tobacco extract and the aerosol-generating material absorbed thereon.

15. The smoking article of claim 14, wherein the paper further includes a flavoring agent absorbed thereon.

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16. The smoking article of claim 1, further comprising a sensor adapted for sensing draw on the smoking article.

17. The smoking article of claim 1, wherein the heater is tubular in shape and positioned around the cartridge.

18. The smoking article of claim 1, wherein the heater comprises at least one elongated portion extending downstream therefrom.

19. The smoking article of claim 1, wherein at least a portion of the cartridge is circumscribed by a wrapping material.

20. The smoking article of claim 1, wherein the cartridge is conductive and in electrical contact with an electrical circuitry within the smoking article such that electrical resistance heating can be provided by the cartridge.

21. The smoking article of claim 20, wherein the substrate incorporates a conductive material that conducts heat produced by electrical resistance heating.

22. The smoking article of claim 21, wherein the conductive material comprises aluminum or copper.

23. A tobacco-containing, electrically-powered smoking article comprising:

(a) a tubular outer housing having a mouth-end and an end distal to the mouth-end, the housing comprising an opening adapted for intake of air into the smoking article;

(b) an electrical power source within the outer housing;

(c) at least one electrical resistance heater within the outer housing, the heater being configured to allow air flow therethrough and being powered by said electrical power source, and wherein the heater comprises at least one elongated portion extending downstream therefrom;

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(d) a puff-actuated controller adapted for regulating current flow through the heater during draw, the controller comprising a sensor adapted for sensing draw by the user on the smoking article; and

(e) a rod-shaped carrier device removably engaged with the mouth-end of the outer housing and comprising a tubular mouth-end piece and a tubular cartridge with two open ends allowing air to flow therethrough, wherein the cartridge includes a tobacco-containing absorbent material with an aerosol-generating material absorbed thereon, wherein the cartridge is operatively positioned within the outer housing and adjacent to the heater such that the heater is adapted for heating at least a portion of the tobacco and the aerosol-generating material and such that air drawn into the outer housing passes through at least a portion of the heater, through the cartridge, and through the mouth-end piece.

24. The smoking article of claim 23, wherein the aerosol-forming material comprises glycerin, propylene glycol, or a mixture thereof.

25. The smoking article of claim 23, wherein the tobacco-containing absorbent material is a paper material.

26. The smoking article of claim 25, wherein the tobacco-containing absorbent material is a paper material with a tobacco extract absorbed thereon.

27. The smoking article of claim 23, wherein the tobacco-containing absorbent material is a paper-type reconstituted tobacco.

28. The smoking article of Claim 23, wherein the tobacco-containing absorbent material comprises polyethylene terephthalate fibers.

29. The smoking article of claim 28, wherein the polyethylene terephthalate fibers are blended with tobacco cut filler.

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30. The smoking article of claim 23, wherein the tobacco-containing absorbent material further comprises a flavoring agent absorbed thereon.

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ABSTRACT OF THE DISCLOSURE

A smoking article may include a cigarette incorporated within an electrically powered aerosol generating device that acts as a holder for that cigarette. The smoking article possesses at least one form of tobacco. The smoking article also possesses a mouth-end piece that is used by the smoker to inhale components of tobacco that are generated by the action of heat upon components of the cigarette. A representative smoking article possesses an outer housing incorporating a source of electrical power (e.g., a battery), a sensing mechanism for powering the device at least during periods of draw, and a heating device (e.g., at least one electrical resistance heating element) for forming a thermally generated aerosol that incorporates components of tobacco. During use, the cigarette is positioned within the device, and after use, the used cigarette is removed from the device and replaced with another cigarette.

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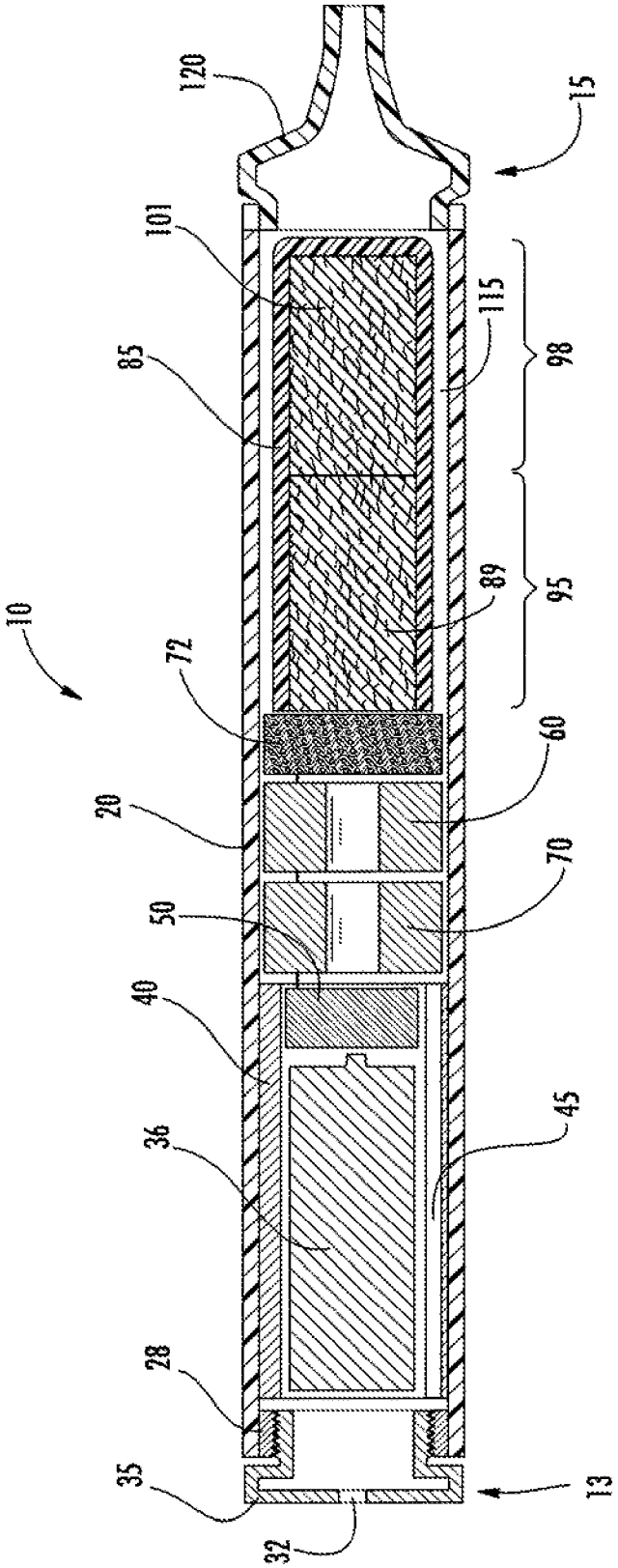


FIG. 1

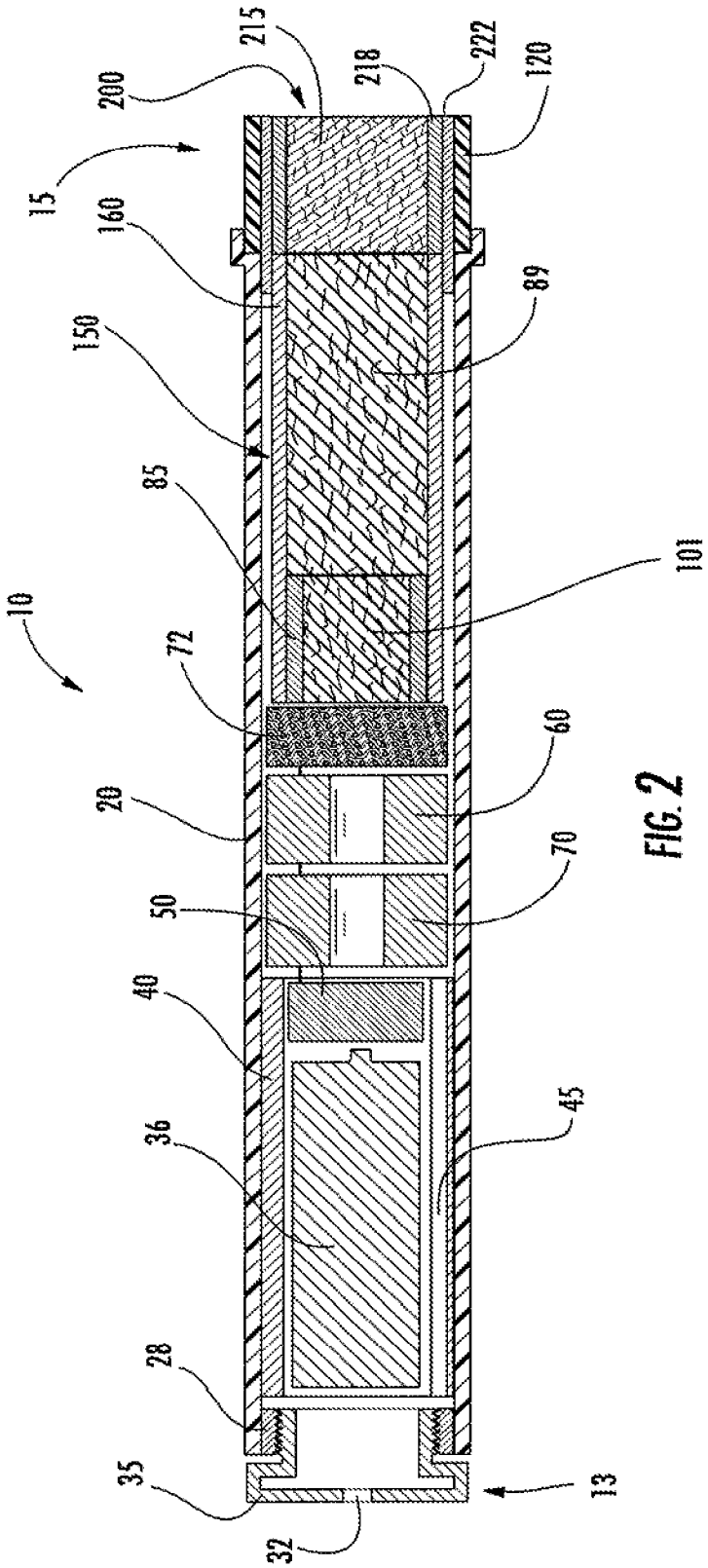


FIG. 2

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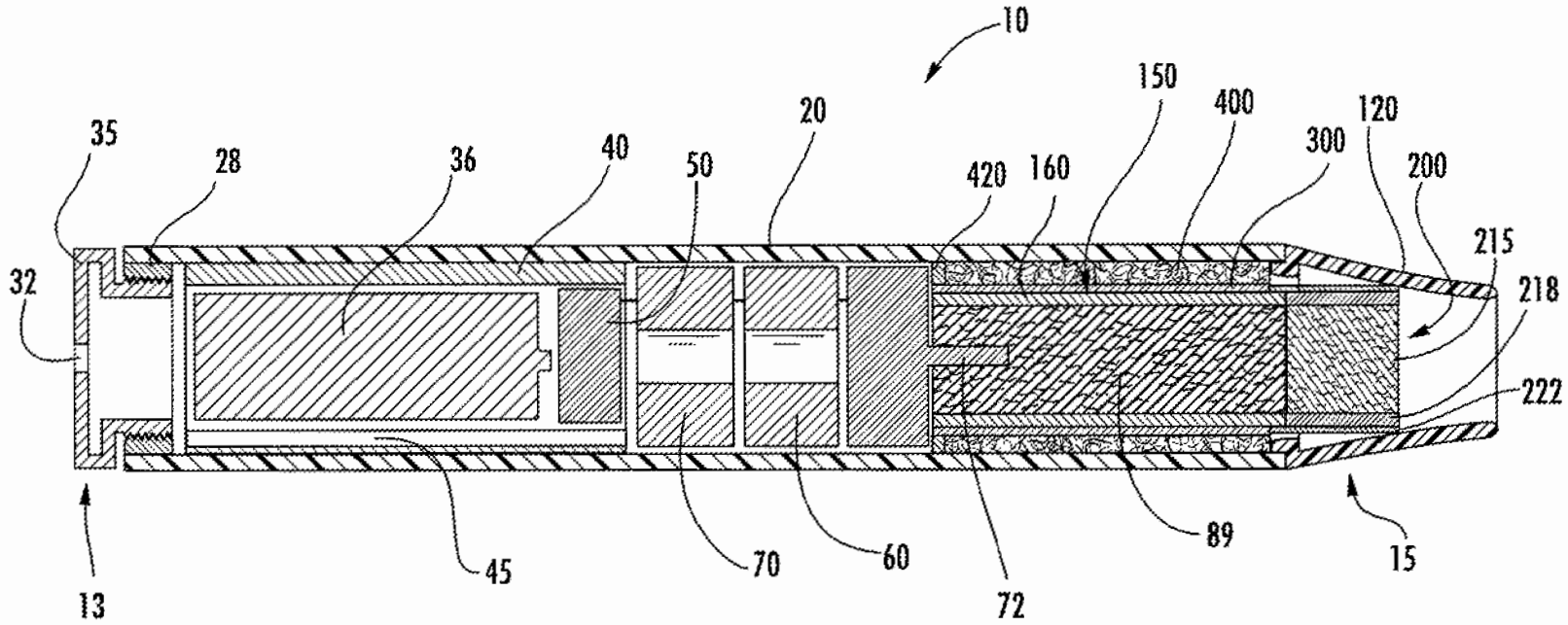


FIG. 3

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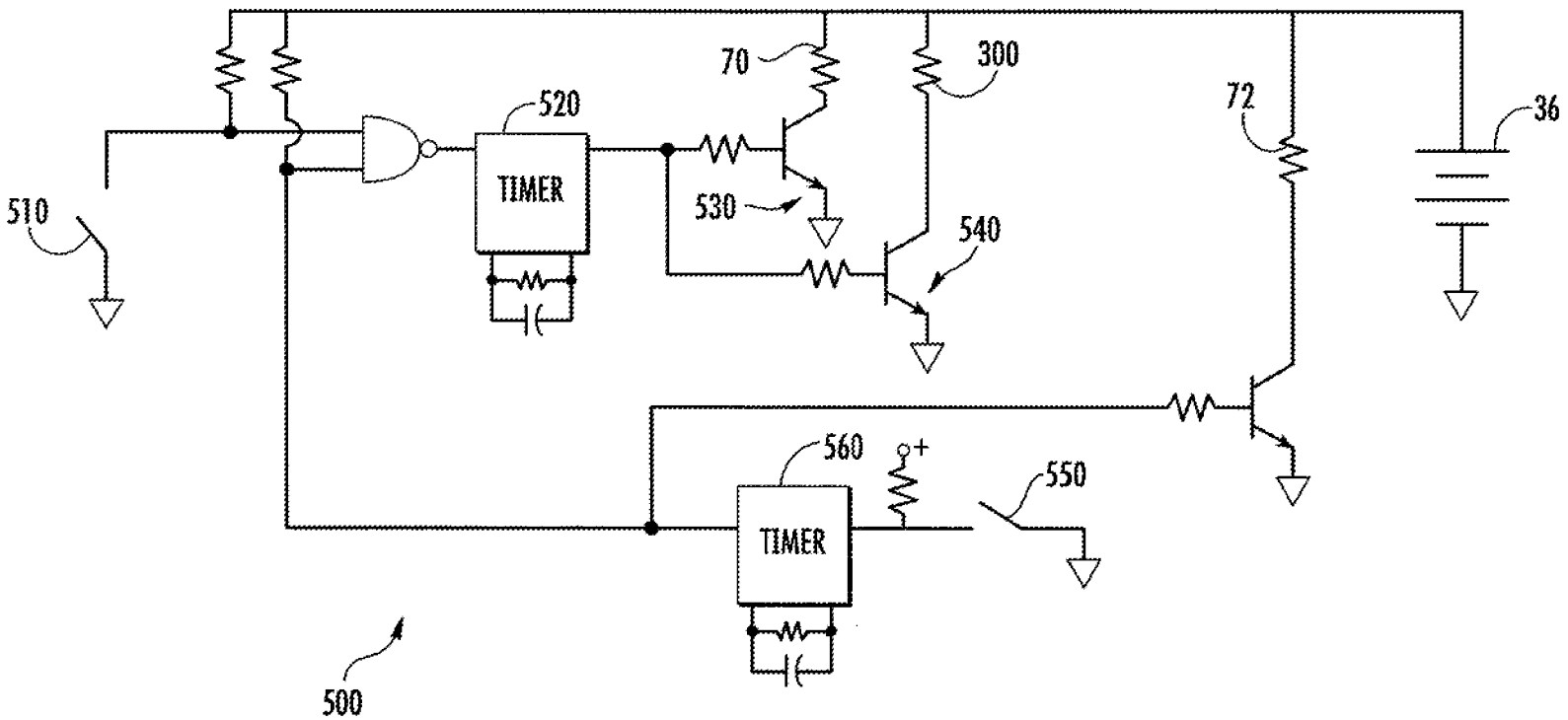


FIG. 4

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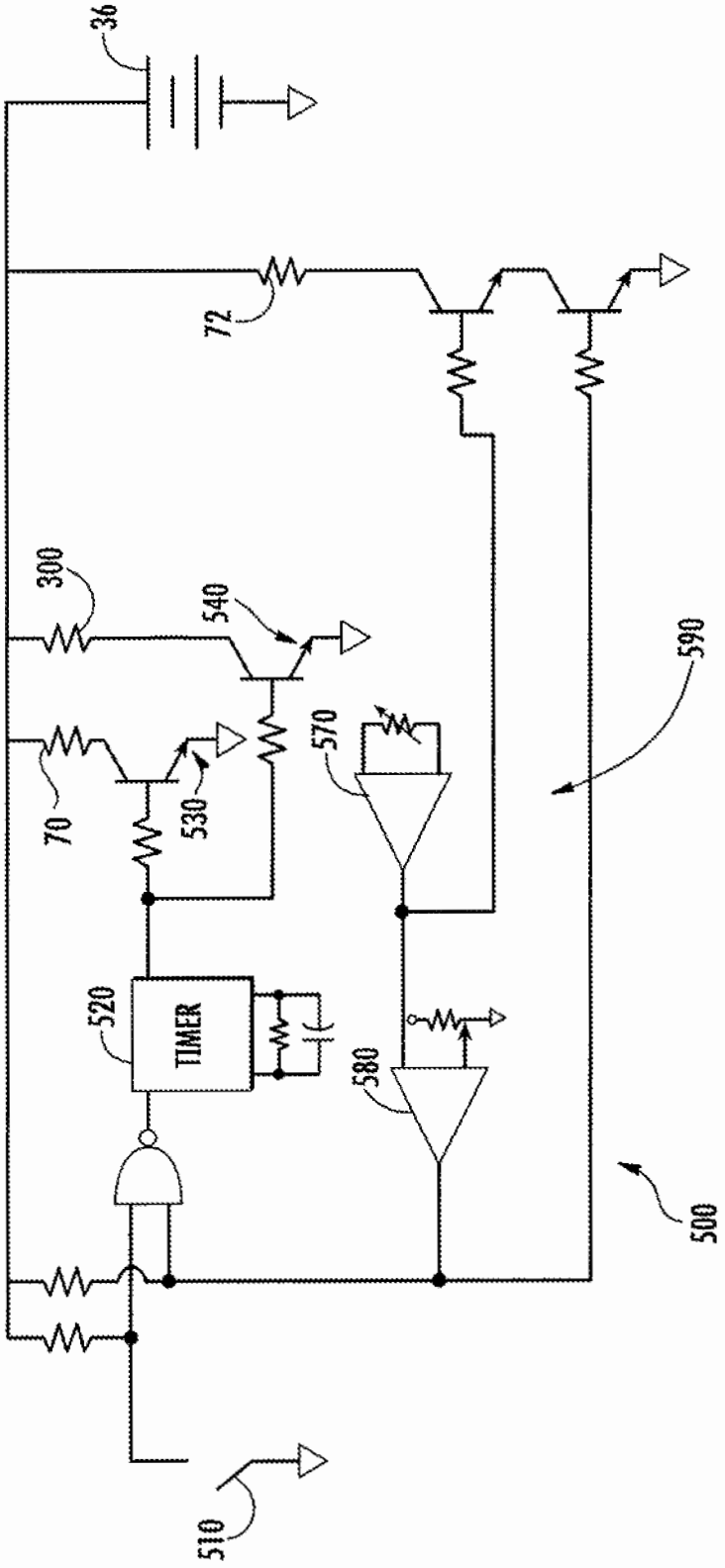


FIG. 5

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Attorney Docket No. **R60999 1400US.C3 (0830.9)**

DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63)

This Declaration is directed to the patent application entitled:

TOBACCO-CONTAINING SMOKING ARTICLE,

the specification of which

☐ is attached hereto

OR

☒ was filed on October 29, 2014 as United States Application No. 14/527,287 or PCT International Application Number ___ and was amended on ___ (if applicable).

Each below named inventor hereby declares that: (1) the above-identified application was made or authorized to be made by me; (2) I believe that I am the original inventor or an original joint inventor of a claimed invention in the application; and (3) I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

Full name of (first/sole) inventor: John Howard Robinson

Inventor's Signature: John Howard Robinson Date: 10/14/16

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Full name of second inventor: David William Griffith, Jr.

Inventor's Signature: David William Griffith Date: 10-10-2016

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Full name of third inventor: Billy Tyrone Conner

Inventor's Signature: Billy Tyrone Conner Date: 10/07/2016

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Full name of fourth inventor: Evon Llewellyn Crooks
Inventor's
Signature: Evon Llewellyn Crooks Date: 10/12/2016

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Full name of fifth inventor: Dempsey Bailey Brewer, Jr.

Inventor's Signature: _____ Date: 10/21/2016

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Doc Code: PA..
Document Description: Power of Attorney

PTO/AIA/82A (07-13)
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NOTE: This form is to be submitted with the Power of Attorney by Applicant form (PTO/AIA/82B) to identify the application to which the Power of Attorney is directed, in accordance with 37 CFR 1.5, unless the application number and filing date are identified in the Power of Attorney by Applicant form. If neither form PTO/AIA/82A nor form PTO/AIA82B identifies the application to which the Power of Attorney is directed, the Power of Attorney will not be recognized in the application.

Application Number	To Be Assigned
Filing Date	Concurrently Herewith
First Named Inventor	John Howard Robinson
Title	TOBACCO-CONTAINING SMOKING ARTICLE
Art Unit	To Be Assigned
Examiner Name	To Be Assigned
Attorney Docket Number	R60999 1400US.C5 (1777.4)

SIGNATURE of Applicant or Patent Practitioner

Signature	/lauren f. anderson/	Date (Optional)	
Name	Lauren F. Anderson	Registration Number	69,344
Title (if Applicant is a juristic entity)			
Applicant Name (if Applicant is a juristic entity)	RAI Strategic Holdings, Inc.		

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. If more than one applicant, use multiple forms.

☐ *Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. 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 3 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: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number	Filing Date

(Note: The boxes above may be left blank if information is provided on form PTO/AIA/82A.)

☑ I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above: 26158

OR

☐ I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

Please recognize or change the correspondence address for the application identified in the attached transmittal letter to:

☑ The address associated with the above-mentioned Customer Number

OR

☐ The address associated with Customer Number:

OR

Firm or Individual Name					
Address					
City		State		Zip	
Country					
Telephone		Email			

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

RAI STRATEGIC HOLDINGS, INC.

☐ Inventor or Joint Inventor (title not required below)

☐ Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)

☑ Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)

☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature	Michael J Madigan	Date (Optional)	March 31, 2016
Name	Michael J. Madigan		
Title	Secretary		

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

☐ Total of forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. 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 3 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: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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Attorney's Docket No. **R60999 1400US.C5 (1777.4)** PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re:	Robinson *et al.*	Confirmation No.:	*To Be Assigned*
Appl. No.:	*To Be Assigned*	Group Art Unit:	*To Be Assigned*
Filed:	*Concurrently Herewith*	Examiner:	*To Be Assigned*
For:	TOBACCO-CONTAINING SMOKING ARTICLE		

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

INFORMATION DISCLOSURE STATEMENT
CITATION UNDER 37 C.F.R. § 1.97

Sir:

Attached is a list of documents on form PTO-1449.

It is requested that the Examiner consider these documents and officially make them of record in accordance with the provisions of 37 C.F.R. § 1.97 and Section 609 of the MPEP. By identifying the listed documents, Applicant in no way makes any admission as to the prior art status of the listed documents, but is instead identifying the listed documents for the sake of full disclosure.

Any foreign patents or non-patent literature documents items are attached, except those that were supplied in, or cited by the Office during prosecution of, parent Application No. 15/286,087, filed October 5, 2016. Since the benefit of this application was claimed under 35 U.S.C. 120, no copies need to be furnished in accordance with 37 C.F.R. 1.98(d); however, copies will be furnished on request.

Respectfully submitted,

/lauren f. anderson/

Lauren F. Anderson
Registration No. 69,344

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Womble Bond Dickinson (US) LLP
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Atlanta, GA 30357-0037
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Complete if Known	
				Application Number	*To Be Assigned*
				Filing Date	*Concurrently Herewith*
				First Named Inventor	John Howard Robinson
				Art Unit	*To Be Assigned*
				Examiner Name	*To Be Assigned*
Sheet	1	of	13	Attorney Docket Number	**R60999 1400US.C5 (1777.4)**

U. S. PATENT DOCUMENTS					
Examiner Initials*	Cite No.	Document Number Number - Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages of Relevant Figures Appear
	1	US-1,514,682	11-11-1924	Wilson	
	2	US-1,771,366	07-22-1930	Wyss et al.	
	3	US-2,057,353	10-13-1936	Whittemore, Jr.	
	4	US-2,104,266	01-04-1938	McCormick	
	5	US-3,200,819	08-17-1965	Gilbert	
	6	US-3,258,015	06-28-1966	Ellis et al.	
	7	US-3,356,094	12-05-1967	Ellis et al.	
	8	US-3,479,561	11-18-1969	Janning	
	9	US-3,486,508	12-30-1969	Sipos	
	10	US-3,516,417	06-23-1970	Moses	
	11	US-3,614,956	10-26-1971	Thornton	
	12	US-3,738,374	06-12-1973	Bennett	
	13	US-3,766,000	10-16-1973	Gibson	
	14	US-3,844,294	10-29-1974	Webster	
	15	US-3,878,850	04-22-1975	Gibson et al.	
	16	US-3,931,824	01-13-1976	Miano et al.	
	17	US-3,943,941	03-16-1976	Boyd et al.	
	18	US-4,044,777	08-30-1977	Boyd et al.	
	19	US-4,079,742	03-21-1978	Rainer et al.	
	20	US-4,190,046	02-26-1980	Virag	
	21	US-4,219,031	08-26-1980	Rainer et al.	
	22	US-4,233,993	11-18-1980	Miano et al.	
	23	US-4,284,089	08-18-1981	Ray	
	24	US-4,286,604	09-01-1981	Ehretsmann et al.	

Examiner Signature		Date Considered	

*Examiner: Initial if reference 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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INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Complete if Known	
				Application Number	*To Be Assigned*
				Filing Date	*Concurrently Herewith*
				First Named Inventor	John Howard Robinson
				Art Unit	*To Be Assigned*
				Examiner Name	*To Be Assigned*
Sheet	2	of	13	Attorney Docket Number	**R60999 1400US.C5 (1777.4)**

U. S. PATENT DOCUMENTS					
	25	US-4,303,083	12-01-1981	Burruss, Jr.	
	26	US-4,326,544	04-27-1982	Hardwick et al.	
	27	US-4,340,072	07-20-1982	Bolt et al.	
	28	US-4,347,855	09-07-1982	Lanzillotti et al.	
	29	US-4,391,285	07-05-1983	Burnett et al.	
	30	US-4,635,651	01-13-1987	Jacobs	
	31	US-4,700,727	10-20-1987	Torigian	
	32	US-4,714,082	12-22-1987	Banerjee et al.	
	33	US-4,735,217	04-05-1988	Gerth et al.	
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	288	US-2014/0261495	09-18-2014	Novak et al.	
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	291	US-2014/0270730	09/18/2014	DePiano et al.	
	292	US-2014/0345631	11-27-2014	Bowen et al.	

FOREIGN PATENT DOCUMENTS

Examiner Signature		Date Considered	

*Examiner: Initial if reference 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.

ELECTRONICALLY FILED USING THE EFS-WEB ELECTRONIC FILING SYSTEM OF THE UNITED STATES PATENT AND TRADEMARK OFFICE ON JANUARY 24, 2018.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Complete if Known	
				Application Number	*To Be Assigned*
				Filing Date	*Concurrently Herewith*
				First Named Inventor	John Howard Robinson
				Art Unit	*To Be Assigned*
				Examiner Name	*To Be Assigned*
Sheet	12	of	13	Attorney Docket Number	**R60999 1400US.C5 (1777.4)**

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.	Foreign Patent Document Country Code - Number Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	English Language Translation Attached
	293	GB 755,475	08-22-1956	Peterson		
	294	AU 276250	07-08-1965	Battelle Memorial Institute		
	295	GB 1 431 045	04-07-1976	Porter et al.		
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	297	EP 0 295 122	12-14-1988	Imperial Tobacco Limited		
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	303	EP 0 845 220	06-03-1998	Japan Tobacco Inc.		
	304	JP 2949114	09-13-1999	Japan Tobacco Inc.; Nippon Tabako Sangyo KK		
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	308	CN 1541577	11-03-2004	HAN, Li		
	309	WO 2005/099494 A1	03-18-2005	Hon, Lik		

Examiner Signature		Date Considered	

*Examiner: Initial if reference 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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RAI Exhibit 2008
Ecto World v. RAI
PGR2024-00049

INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Complete if Known	
				Application Number	*To Be Assigned*
				Filing Date	*Concurrently Herewith*
				First Named Inventor	John Howard Robinson
				Art Unit	*To Be Assigned*
				Examiner Name	*To Be Assigned*
Sheet	13	of	13	Attorney Docket Number	**R60999 1400US.C5 (1777.4)**

FOREIGN PATENT DOCUMENTS						
	310	CN 2719043	08-24-2005	HAN, Li		
	311	EP 1 618 803 A1	01-25-2006	Hon, Lik		
	312	WO 2007/078273	07-12-2007	Liu		
	313	DE 10 2006 004 484	08-09-2007	Schmidt, Karsten		
	314	WO 2007/131449	11-22-2007	Han		

OTHER DOCUMENTS			
Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s) , volume-issue number(s), publisher, city and/or country where published.	English Language Translation Attached
	315	LU, ZHANG, "Safe Substitute", China Daily, July 11, 2005.	
	316	Chemical and Biological Studies on New Cigarette Prototypes that Heat Instead of Burn Tobacco, R. J. Reynolds Tobacco Company Monograph, 1988, pp. 43-72.	
	317	Inhalation Technology, Dr. Donald E. Garden, ed., Vol. 12, No. 5, pp. 1-58, (2000).	
	318	Extended European Search Report, EP 17 18 5645, mailed November 28, 2017.	

Examiner Signature		Date Considered	

*Examiner: Initial if reference 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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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re:	Robinson *et al.*	Confirmation No.:	*To Be Assigned*
Appl. No.:	*To Be Assigned*	Group Art Unit:	*To Be Assigned*
Filed:	*Concurrently Herewith*	Examiner:	*To Be Assigned*
For:	TOBACCO-CONTAINING SMOKING ARTICLE		

Docket No.: R60999 1400US.C5 (1777.4)
Customer No.: 26158

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

PRELIMINARY AMENDMENT
37 CFR § 1.115

Sir:

Please enter this Preliminary Amendment before calculating the claim fee and amend the above-identified application as follows:

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

Remarks begin on page 6 of this paper.

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Amendments to the Claims:

1. – 30. (Canceled)

31. (New) An aerosol generating smoking article comprising:

an outer housing;

an electrical resistance heater configured for electrical connection with an electrical power source;

a substrate carrier positioned in a first segment of the outer housing, the substrate carrier including an aerosol-generating material; and

tobacco positioned in a second segment of the outer housing;

wherein the substrate carrier is operatively positioned such that the aerosol-generating material can be wicked into contact with the electrical resistance heater for volatilization to produce an aerosol; and

wherein the tobacco is operatively positioned such that the produced aerosol can be drawn through the tobacco and into the mouth of a user of the smoking article.

32. (New) The aerosol generating smoking article of claim 31, wherein the aerosol-generating material comprises glycerin, propylene glycol, or a mixture thereof.

33. (New) The aerosol generating smoking article of claim 31, wherein the tobacco is incorporated within a cartridge.

34. (New) The aerosol generating smoking article of claim 33, wherein the cartridge is formed of a plastic material.

35. (New) The aerosol generating smoking article of claim 31, wherein the tobacco includes a flavoring material.

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36. (New) The aerosol generating smoking article of claim 35, wherein the flavoring material includes menthol.

37. (New) The aerosol generating smoking article of claim 31, wherein the substrate carrier comprises a fibrous material.

38. (New) The aerosol generating smoking article of claim 31, wherein the aerosol-generating material is positioned in fluid communication with the tobacco such that air drawn through the outer housing can be drawn through both the aerosol-generating material and the tobacco, thereby generating an aerosol that includes volatilized portions of the aerosol-generating material and volatilized components derived from the tobacco.

39. (New) The aerosol generating smoking article of claim 31, further comprising a puff-actuated controller adapted for regulating current flow through the electrical resistance heater during draw, the controller comprising a sensor adapted for sensing draw on the aerosol generating smoking article by the user.

40. (New) The aerosol generating smoking article of claim 31, wherein the tobacco is at least partially supported in a mouth-end piece that is removably attached to the outer housing.

41. (New) The aerosol generating smoking article of claim 40, wherein the mouth-end piece includes a filter element.

42. (New) The aerosol generating smoking article of claim 31, wherein the tobacco is in the form of pieces or pellets.

43. (New) An aerosol generating smoking article comprising:

a tubular outer housing having a mouth-end and an end distal to the mouth-end;

an electrical power source;

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an electrical resistance heater within the tubular outer housing in electrical connection with the electrical power source;

a puff-actuated controller adapted for regulating current flow through the electrical resistance heater during draw, the controller comprising a sensor adapted for sensing draw on the aerosol generating smoking article by a user;

a substrate carrier that is an adsorbent material with an aerosol-generating material absorbed therein, wherein the substrate carrier is operatively positioned such that the aerosol-generating material can be wicked into contact with the electrical resistance heater for volatilization to produce an aerosol; and

a mouth-end piece removably positioned at the mouth-end of the tubular outer housing, the mouth-end piece at least partially supporting a tobacco material.

44. (New) The aerosol generating smoking article of claim 43, wherein the aerosol-generating material comprises glycerin, propylene glycol, or a mixture thereof.

45. (New) The aerosol generating smoking article of claim 43, wherein the mouth-end piece is formed of a plastic material.

46. (New) The aerosol generating smoking article of claim 43, wherein the tobacco material includes a flavoring material.

47. (New) The aerosol generating smoking article of claim 46, wherein the flavoring material includes menthol.

48. (New) The aerosol generating smoking article of claim 43, wherein the substrate carrier comprises a fibrous material.

49. (New) The aerosol generating smoking article of claim 43, wherein the aerosol-generating material is positioned in fluid communication with the tobacco material such that air

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drawn through the outer housing can be drawn through both the aerosol-generating material and the tobacco material, thereby generating an aerosol that includes volatilized portions of the aerosol-generating material and volatilized components derived from the tobacco material.

50. (New) The aerosol generating smoking article of claim 43, wherein the mouth-end piece includes a filter element.

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REMARKS

In this Preliminary Amendment, claims 1-30 are canceled and claims 31-50 are added as new claims. Claims 31 and 43 are independent claims. No new matter is added with this preliminary amendment.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefor (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 09-0528.

Respectfully submitted,

/lauren f. anderson/

Lauren F. Anderson
Registration No. 69,344

Customer No. 26158
Womble Bond Dickinson (US) LLP
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Atlanta, GA 30357-0037
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Fax Raleigh Office (919) 755-2150

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Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	TOBACCO-CONTAINING SMOKING ARTICLE
First Named Inventor/Applicant Name:	John Howard Robinson
Filer:	Lauren F Anderson
Attorney Docket Number:	R60999 1400US.C5 (1777.4)

Filed as Large Entity

Filing Fees for Track I Prioritized Examination - Nonprovisional Application under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
UTILITY APPLICATION FILING	1011	1	300	300
UTILITY SEARCH FEE	1111	1	660	660
UTILITY EXAMINATION FEE	1311	1	760	760
REQUEST FOR PRIORITIZED EXAMINATION	1817	1	4000	4000
Pages:				
Claims:				
Miscellaneous-Filing:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
PUBL. FEE- EARLY, VOLUNTARY, OR NORMAL	1504	1	0	0
PROCESSING FEE, EXCEPT PROV. APPLS.	1830	1	140	140

Petition:	
Patent-Appeals-and-Interference:	
Post-Allowance-and-Post-Issuance:	
Extension-of-Time:	
Miscellaneous:	
Total in USD ($)	**5860**

Electronic Acknowledgement Receipt

EFS ID:	31597786
Application Number:	15879268
International Application Number:	
Confirmation Number:	9513
Title of Invention:	TOBACCO-CONTAINING SMOKING ARTICLE
First Named Inventor/Applicant Name:	John Howard Robinson
Customer Number:	26158
Filer:	Lauren F Anderson/Shari Elofson
Filer Authorized By:	Lauren F Anderson
Attorney Docket Number:	R60999 1400US.C5 (1777.4)
Receipt Date:	24-JAN-2018
Filing Date:	
Time Stamp:	18:34:17
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$5860
RAM confirmation Number	012518INTEFSW00005191090528
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal of New Application	R60999_1400US_C5_1777_4_Transmittal.pdf	343775 05c1144caabbbc8d6ed73edaa6ff17ed04ea894e	no	2
Warnings:					
Information:					
2	Fee Worksheet (SB06)	R60999_1400US_C5_1777_4_Fee_Transmittal.pdf	263427 b430321aabd4817f64c7818100e2817e8906e686	no	2
Warnings:					
Information:					
3	TrackOne Request	R60999_1400US_C5_1777_4_Request_Prioritized_Examination.pdf	124666 c92c253fe054a4935b71fcd495d45d13677ba556	no	2
Warnings:					
Information:					
4	Fee Worksheet (SB06)	R60999_1400US_C5_1777_4_Processing_Fee_Transmittal.pdf	163093 7f59aa490e602f74225b8bce4aa6c55ded40d299	no	2
Warnings:					
Information:					
5	Application Data Sheet	R60999_1400US_C5_1777_4_ADS.PDF	1823688 218462a84aa6924b499bafd974d947a9616076be	no	10
Warnings:					
Information:					
6		R60999_1400US_C5_1777_4_Continuation_Application.pdf	241664 5e1b4da414d778abb6b18bbcfc45d9cda732350e	yes	49
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	

	Specification		1		43
	Claims		44		48
	Abstract		49		49
Warnings:					
Information:					
7	Drawings-only black and white line drawings	R60999_1400US_C5_1777_4_Drawings.PDF	379279 53997ec76a566335efd2731d5db0d93315b572d5	no	5
Warnings:					
Information:					
8	Oath or Declaration filed	R60999_1400US_C5_1777_4_Declaration.PDF	69509 a640ec8cfe32d24b3511f69b6f4eb81dc73a6415	no	5
Warnings:					
Information:					
9	Power of Attorney	R60999_1400US_C5_1777_4_POA.pdf	313648 3e5d7778fbe4145dcc1ee0d745f182c35e3be358	no	2
Warnings:					
Information:					
10	Transmittal Letter	R60999_1400US_C5_1777_4_IDS_Cover.pdf	8237 aa193d24713a161b355077d241685ab8bb1f7752	no	1
Warnings:					
Information:					
11	Information Disclosure Statement (IDS) Form (SB08)	R60999_1400US_C5_1777_4_IDS_1449.pdf	112722 4dc24c198220738203fa690cf147a54e03994e9e	no	13
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
12		R60999_1400US_C5_1777_4_Preliminary_Amendment.pdf	20843 51f0e0207a4c0b0a5b214cfa4b7a04a6dd75dad5	yes	6

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Preliminary Amendment	1	1
	Claims	2	5
	Applicant Arguments/Remarks Made in an Amendment	6	6

Warnings:					
Information:					
13	Fee Worksheet (SB06)	fee-info.pdf	40411 936727c4f4b81cefb5f77a4606c3a182ceb66e19	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	3904962		

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.

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UNITED STATES DEPARTMENT OF COMMERCE
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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
15/879,268	01/24/2018	1747	1880	R60999 1400US.C5 (1777.4)	20	2

CONFIRMATION NO. 9513

26158
WOMBLE BOND DICKINSON (US) LLP
ATTN: IP DOCKETING
P.O. BOX 7037
ATLANTA, GA 30357-0037

FILING RECEIPT



Date Mailed: 02/21/2018

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**

Inventor(s)

John Howard Robinson, Kernersville, NC;
David William Griffith, Winston-Salem, NC;
Billy Tyrone Conner, Clemmons, NC;
Evon Llewellyn Crooks, Mocksville, NC;
Dempsey Bailey Brewer, East Bend, NC;

Applicant(s)

RAI Strategic Holdings, Inc., Winston-Salem, NC;

Power of Attorney: The patent practitioners associated with Customer Number 26158

Domestic Priority data as claimed by applicant

This application is a CON of 15/286,087 10/05/2016 PAT 9901123
which is a CON of 14/527,287 10/29/2014 PAT 9801416
which is a CON of 13/297,983 11/16/2011 PAT 8899238
which is a CON of 12/763,890 04/20/2010 PAT 8079371
which is a CON of 11/550,634 10/18/2006 PAT 7726320

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

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PGR2024-00049
Page 107

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 02/20/2018

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/879,268**

Projected Publication Date: 05/31/2018

Non-Publication Request: No

Early Publication Request: No

Title

TOBACCO-CONTAINING SMOKING ARTICLE

Preliminary Class

131

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

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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

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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 (1-866-999-4258).

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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 15/879,268

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	300
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	660
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	760
TOTAL CLAIMS (37 CFR 1.16(i))	20 minus 20 =	*			OR	x 100 =	0.00
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2 minus 3 =	*				x 460 =	0.00
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 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).						0.00
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	1720

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))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(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 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))							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 found in the appropriate box in column 1.

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 NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/879,268	01/24/2018	John Howard Robinson	R60999 1400US.C5 (1777.4)

CONFIRMATION NO. 9513

26158
WOMBLE BOND DICKINSON (US) LLP
ATTN: IP DOCKETING
P.O. BOX 7037
ATLANTA, GA 30357-0037

INFORMAL NOTICE

OC000000097502860

Date Mailed: 02/21/2018

INFORMATIONAL NOTICE TO APPLICANT

Applicant is notified that the above-identified application contains the deficiencies noted below. No period for reply is set forth in this notice for correction of these deficiencies. However, if a deficiency relates to the inventor's oath or declaration, the applicant must file an oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each actual inventor no later than the expiration of the time period set in the "Notice of Allowability" to avoid abandonment. See 37 CFR 1.53(f).

The item(s) indicated below are also required and should be submitted with any reply to this notice to avoid further processing delays.

- A properly executed inventor's oath or declaration has not been received for the following inventor(s):
  David William Griffith
  Dempsey Bailey Brewer

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/dmnguyen/

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UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/879,268	01/24/2018	John Howard Robinson	R60999 1400US.C5 (1777.4)	9513

26158 7590 03/08/2018

WOMBLE BOND DICKINSON (US) LLP
ATTN: IP DOCKETING
P.O. BOX 7037
ATLANTA, GA 30357-0037

EXAMINER	
NGUYEN, PHU HOANG	

ART UNIT	PAPER NUMBER
1747	

NOTIFICATION DATE	DELIVERY MODE
03/08/2018	ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

IPDocketing@wbd-us.com

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

Doc Code: TRACK1.GRANT

Decision Granting Request for Prioritized Examination (Track I or After RCE)	Application No.: 15/879,268

1. THE REQUEST FILED January 24, 2018 IS **GRANTED.**

The above-identified application has met the requirements for prioritized examination
- A. ☒ for an original nonprovisional application (Track I).
- B. ☐ for an application undergoing continued examination (RCE).

2. **The above-identified application will undergo prioritized examination.** The application will be accorded special status throughout its entire course of prosecution until one of the following occurs:

- A. filing a **petition for extension of time** to extend the time period for filing a reply;
- B. filing an **amendment to amend the application to contain more than four independent claims, more than thirty total claims**, or a multiple dependent claim;
- C. filing a **request for continued examination**;
- D. filing a notice of appeal;
- E. filing a request for suspension of action;
- F. mailing of a notice of allowance;
- G. mailing of a final Office action;
- H. completion of examination as defined in 37 CFR 41.102; or
- I. abandonment of the application.

Telephone inquiries with regard to this decision should be directed to **Michelle R. Eason** at (571) 272-4231. In his/her absence, calls may be directed to Brian W. Brown at (571) 272-5338.

/Michelle R. Eason/ (*Signature*)

Paralegal Specialist, Office of Petitions (Title)

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Office of Petitions: Decision Count Sheet

Mailing Month: 3

Application No.: 15879268

15879268

For US serial numbers: enter number only, no slashes or commas. Ex: 10123456
For PCT: enter "51+single digit of year of filing+last 5 numbers", Ex. for PCT/US05/12345, enter 51512345

Deciding Official: Eason, Michelle

Count (1) - Palm Credit 15879268

Decision: GRANT

FINANCE WORK NEEDED
☐ Select Check Box for YES

GRANT

Decision Type: 643 - Track One request

643

Notes:

Count (2)

Decision: n/a

FINANCE WORK NEEDED
☐ Select Check Box for YES

Decision Type: NONE

Notes:

Count (3)

Decision: n/a

FINANCE WORK NEEDED
☐ Select Check Box for YES

Decision Type: NONE

Notes:

Initials of Approving Official (if required)

If more than 3 decisions, attach 2nd count sheet & mark this box ☐

Printed on: 3/5/2018

Office of Petitions Internal Document - Ver. 5.0

Office of Petitions: Routing Sheet



Application No. 15879268

This application is being forwarded to your office for further processing. A decision has been rendered on a petition filed in this application, as indicated below. For details of this decision, please see the document PET.OP.DEC filed on the same date as this document.

- [X] **GRANTED**
- [ ] **DISMISSED**
- [ ] **DENIED**

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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
15/879,268	01/24/2018	1747	1880	R60999 1400US.C5 (1777.4)	20	2

CONFIRMATION NO. 9513

FILING RECEIPT

26158
WOMBLE BOND DICKINSON (US) LLP
ATTN: IP DOCKETING
P.O. BOX 7037
ATLANTA, GA 30357-0037

OC000000097502859

Date Mailed: 02/21/2018

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**

Inventor(s)

John Howard Robinson, Kernersville, NC;
~~David William Griffith,~~ Winston-Salem, NC; **David William Griffith, Jr.**
Billy Tyrone Conner, Clemmons, NC;
Evon Llewellyn Crooks, Mocksville, NC;
~~Dempsey Bailey Brewer~~, East Bend, NC; **Dempsey Bailey Brewer, Jr.**

Applicant(s)

RAI Strategic Holdings, Inc., Winston-Salem, NC;

Power of Attorney: The patent practitioners associated with Customer Number 26158

Domestic Priority data as claimed by applicant

This application is a CON of 15/286,087 10/05/2016 PAT 9901123
which is a CON of 14/527,287 10/29/2014 PAT 9801416
which is a CON of 13/297,983 11/16/2011 PAT 8899238
which is a CON of 12/763,890 04/20/2010 PAT 8079371
which is a CON of 11/550,634 10/18/2006 PAT 7726320

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

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Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 02/20/2018

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/879,268**

Projected Publication Date: 05/31/2018

Non-Publication Request: No

Early Publication Request: No

Title

TOBACCO-CONTAINING SMOKING ARTICLE

Preliminary Class

131

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

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

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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 (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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Attorney's Docket No. **R60999 1400US.C5 (1777.4)**

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re:	Robinson *et al.*	Confirmation No.:	9513
Appl. No.:	15/879,268	Group Art Unit:	1747
Filed:	January 24, 2018	Examiner:	Phu Hoang Nguyen
For:	TOBACCO-CONTAINING SMOKING ARTICLE		

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

REQUEST FOR CORRECTED FILING RECEIPT

Sir:

In reviewing the Filing Receipt for the above-referenced application, Applicant notes that errors appear as noted on the enclosed copy of the Filing Receipt. Specifically to correct typographical errors in the naming of the second inventor from *DAVID WILLIAM GRIFFITH* to **--DAVID WILLIAM GRIFFITH, JR.--** and in the naming of the fifth inventor from *DEMPSEY BAILEY BREWER* to **--DEMPSEY BAILEY BREWER, JR.--**. Applicant requests that a corrected Filing Receipt be issued.

An updated Application Data Sheet is being simultaneously filed along with the request for corrected filing receipt.

Applicant requests that a corrected Filing Receipt be issued.

It is not believed that any fees are due at this time, however, if applicable, the Commissioner is authorized to charge the $130.00 fee specified in 37 C.F.R. § 1.17(i) and any additional fee, or credit any refund, to our Deposit Account No. 09-0528.

Respectfully submitted,

/lauren f. anderson/

Lauren F. Anderson
Registration No. 69,344

Customer No. 26158
Womble Bond Dickinson (US) LLP
Attn: Patent Docketing
P.O. Box 7037
Atlanta, GA 30357-0037
Tel Raleigh Office (919) 755-2100
Fax Raleigh Office (919) 755-2150

ELECTRONICALLY FILED USING THE EFS-WEB ELECTRONIC FILING SYSTEM OF THE UNITED STATES PATENT AND TRADEMARK OFFICE ON MARCH 30, 2018.

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PTO/AIA/14 (11-15)
Approved for use through 04/30/2017. OMB 0651-0032
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	R60999 1400US.C5 (1777.4)
	Application Number	
Title of Invention	TOBACCO-CONTAINING SMOKING ARTICLE	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2:

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	John	Howard	Robinson	

Residence Information (Select One) ● US Residency Non US Residency Active US Military Service

City	State/Province	Country of Residence
Kernersville	NC	US

Mailing Address of Inventor:

Address 1	604 Antler Court
Address 2	
City	Kernersville
State/Province	NC
Postal Code	27284
Country	US

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	David	William	Griffith	Jr.

Residence Information (Select One) ◉ US Residency Non US Residency Active US Military Service

City	State/Province	Country of Residence
Winston-Salem	NC	US

Mailing Address of Inventor:

Address 1	4130 White Hawk Lane
Address 2	
City	Winston-Salem
State/Province	NC
Postal Code	27106
Country	US

Inventor 3 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Billy	Tyrone	Conner	

Residence Information (Select One) ◉ US Residency Non US Residency Active US Military Service

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PGR2024-00049
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	R60999 1400US.C5 (1777.4)
	Application Number	
Title of Invention	TOBACCO-CONTAINING SMOKING ARTICLE	

City	Clemmons	State/Province	NC	Country of Residence	US

Mailing Address of Inventor:

Address 1	180 Scott Farm Road		
Address 2			
City	Clemmons	State/Province	NC
Postal Code	27012	Country	US

Inventor 4 — Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Evon	Llewellyn	Crooks	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Mocksville	State/Province	NC	Country of Residence	US

Mailing Address of Inventor:

Address 1	749 Howell Road		
Address 2			
City	Mocksville	State/Province	NC
Postal Code	27028	Country	US

Inventor 5 — Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Dempsey	Bailey	Brewer	Jr.

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	East Bend	State/Province	NC	Country of Residence	US

Mailing Address of Inventor:

Address 1	2853 Davis Road		
Address 2			
City	East Bend	State/Province	NC
Postal Code	27018	Country	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	R60999 1400US.C5 (1777.4)
	Application Number	
Title of Invention	TOBACCO-CONTAINING SMOKING ARTICLE	

Customer Number	26158		
Email Address	IPDocketing@wbd-us.com	Add Email	Remove Email

Application Information:

Title of the Invention	TOBACCO-CONTAINING SMOKING ARTICLE		
Attorney Docket Number	R60999 1400US.C5 (1777.4)	**Small Entity Status Claimed**	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	5	**Suggested Figure for Publication (if any)**	1

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	● Customer Number	US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	26158		

PTO/AIA/14 (11-15)
Approved for use through 04/30/2017. 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 contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	R60999 1400US.C5 (1777.4)
	Application Number	
Title of Invention	TOBACCO-CONTAINING SMOKING ARTICLE	

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status: Pending — Remove

Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	Continuation of	15/286087	2016-10-05

Prior Application Status: Patented — Remove

Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
15/286087	Continuation of	14/527287	2014-10-29	9801416	2017-10-31

Prior Application Status: Patented — Remove

Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
14/527287	Continuation of	13/297983	2011-11-16	8899238	2014-12-02

Prior Application Status: Patented — Remove

Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
13/297983	Continuation of	12/763890	2010-04-20	8079371	2011-12-20

Prior Application Status: Patented — Remove

Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
12/763890	Continuation of	11/550634	2006-10-18	7726320	2010-06-01

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button. — Add

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Remove

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)

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Ecto World v. RAI
PGR2024-00049
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PTO/AIA/14 (11-15)
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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.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	R60999 1400US.C5 (1777.4)
	Application Number	
Title of Invention	TOBACCO-CONTAINING SMOKING ARTICLE	

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button. Add

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	R60999 1400US.C5 (1777.4)
	Application Number	
Title of Invention	TOBACCO-CONTAINING SMOKING ARTICLE	

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	R60999 1400US.C5 (1777.4)
	Application Number	
Title of Invention	TOBACCO-CONTAINING SMOKING ARTICLE	

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1 — Remove

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

● Assignee	Legal Representative under 35 U.S.C. 117	Joint Inventor
Person to whom the inventor is obligated to assign.	Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. ☒

Organization Name	RAI Strategic Holdings, Inc.		
Mailing Address Information For Applicant:			
Address 1	401 North Main Street		
Address 2			
City	Winston-Salem	**State/Province**	NC
Country	US	Postal Code	27101
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button. Add

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	R60999 1400US.C5 (1777.4)
	Application Number	
Title of Invention	TOBACCO-CONTAINING SMOKING ARTICLE	

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

Remove

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1			
Address 2			
City		**State/Province**	
Country i		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button. Add

Signature:

Remove

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). **However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).**

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/lauren f. anderson/			Date (YYYY-MM-DD)	2018-01-24
First Name	Lauren	Last Name	Anderson	Registration Number	69,344

Additional Signature may be generated within this form by selecting the Add button. Add

PTO/AIA/14 (11-15)
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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.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	R60999 1400US.C5 (1777.4)
	Application Number	
Title of Invention	TOBACCO-CONTAINING SMOKING ARTICLE	

This collection of information is required by 37 CFR 1.76. 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 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet 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: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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 the Freedom of Information Act requires disclosure of these records.

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 CooperationTreaty.

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 inspections 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.

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Ecto World v. RAI
PGR2024-00049
Page 131

Electronic Acknowledgement Receipt

EFS ID:	32208417
Application Number:	15879268
International Application Number:	
Confirmation Number:	9513
Title of Invention:	TOBACCO-CONTAINING SMOKING ARTICLE
First Named Inventor/Applicant Name:	John Howard Robinson
Customer Number:	26158
Filer:	Lauren F Anderson/Shari Elofson
Filer Authorized By:	Lauren F Anderson
Attorney Docket Number:	R60999 1400US.C5 (1777.4)
Receipt Date:	30-MAR-2018
Filing Date:	24-JAN-2018
Time Stamp:	13:47:50
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		R60999_1400US_C5_1777_4_Request_for_Corrected_FilingReceipt.pdf	302950 6d3366e5218226d5b7257879e12cfea7fb34a4c1	yes	5

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Request for Corrected Filing Receipt	2	5
	Request for Corrected Filing Receipt	1	1

Warnings:					
Information:					
2	Application Data Sheet	R60999_1400US_C5_1777_4_Corrected_ADS.pdf	448284 b1c7a04e8eb1c635f7c560a3cb32772c22311033	no	10
Warnings:					
Information:					
This is not an USPTO supplied ADS fillable form					
		Total Files Size (in bytes):	751234		

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.

Document code: WFEE

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/879,268	01/24/2018	John Howard Robinson	R60999 1400US.C5 (1777.4)

CONFIRMATION NO. 9513

26158
WOMBLE BOND DICKINSON (US) LLP
ATTN: IP DOCKETING
P.O. BOX 7037
ATLANTA, GA 30357-0037

37 CFR 1.48(f)
ACKNOWLEDGEMENT LETTER



Date Mailed: 04/05/2018

NOTICE OF ACCEPTANCE OF REQUEST UNDER 37 CFR 1.48(f)

This is in response to the applicant's request under 37 CFR 1.48(f) submitted on 03/30/2018.

The request under 37 CFR 1.48(f) to correct the inventorship, to correct or update the name of an inventor, or to correct the order of names of joint inventors is accepted.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/mmasfaw/

RAI Exhibit 2008
Ecto World v. RAI
PGR2024-00049
Page 135

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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
15/879,268	01/24/2018	1747	1880	R60999 1400US.C5 (1777.4)	20	2

CONFIRMATION NO. 9513

UPDATED FILING RECEIPT

26158
WOMBLE BOND DICKINSON (US) LLP
ATTN: IP DOCKETING
P.O. BOX 7037
ATLANTA, GA 30357-0037

OC000000098537042

Date Mailed: 04/05/2018

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**

Inventor(s)

John Howard Robinson, Kernersville, NC;
David William Griffith JR., Winston-Salem, NC;
Billy Tyrone Conner, Clemmons, NC;
Evon Llewellyn Crooks, Mocksville, NC;
Dempsey Bailey Brewer JR., East Bend, NC;

Applicant(s)

RAI Strategic Holdings, Inc., Winston-Salem, NC;

Power of Attorney: The patent practitioners associated with Customer Number 26158

Domestic Priority data as claimed by applicant

This application is a CON of 15/286,087 10/05/2016 PAT 9901123
which is a CON of 14/527,287 10/29/2014 PAT 9801416
which is a CON of 13/297,983 11/16/2011 PAT 8899238
which is a CON of 12/763,890 04/20/2010 PAT 8079371
which is a CON of 11/550,634 10/18/2006 PAT 7726320

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

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Ecto World v. RAI
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Page 136

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

Projected Publication Date: 05/31/2018

Non-Publication Request: No

Early Publication Request: No

Title

TOBACCO-CONTAINING SMOKING ARTICLE

Preliminary Class

131

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

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 (1-866-999-4258).

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Ecto World v. RAI
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LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

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Ecto World v. RAI
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Alexandria, Virginia 22313-1450
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/879,268	01/24/2018	John Howard Robinson	R60999 1400US.C5 (1777.4)	9513

26158 7590 05/30/2018

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ATLANTA, GA 30357-0037

EXAMINER	
NGUYEN, PHU HOANG	

ART UNIT	PAPER NUMBER
1747	

NOTIFICATION DATE	DELIVERY MODE
05/30/2018	ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

IPDocketing@wbd-us.com

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Office Action Summary	Application No. 15/879,268	Applicant(s) ROBINSON ET AL.	
	Examiner PHU NGUYEN	Art Unit 1747	AIA (First Inventor to File) Status No

-- 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 MONTHS 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 *1/24/2018*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

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) *31-50* 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) *31-50* is/are rejected.

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

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

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

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

11)☐ The drawing(s) filed on _____ 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).

Priority under 35 U.S.C. § 119

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

Certified copies:

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)).

** 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) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

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The present application is being examined under the pre-AIA first to invent provisions.

Allowable Subject Matter

The following is a statement of reasons for the indication of allowable subject matter:

The closest prior art of Counts et al. (U.S Patent No. 5692525) discloses a tobacco containing, electrically powered smoking article comprising:

an outer housing (by reference sign 37, fig. 2);

an electrical power source (35a, fig.2) within the outer housing;

at least one electrical resistance heater (37, fig. 3) within the outer housing, the heater being configured to allow air flow therethrough and being powered by said electrical power source; and wherein the heater comprises at least one elongated portion extending downstream therefrom.

a substrate carrier positioned in a first segment of the outer housing, the substrate carrier including an aerosol-generating material (23, fig. 2 and column 5, line 65 to column 6, line 5), wherein the cartridge includes a substrate that comprises a tobacco material (reference sign 80, fig. 4A, 220", fig. 7A) and glycerin (corresponding to the claimed "an aerosol forming material") added to the tobacco material as a humectant and as an aerosol precursor (column 12, lines 33-37);

wherein the tobacco is operatively positioned such that the produced aerosol can be drawn through the tobacco and into the mouth of a user of the smoking article (column 4, lines 14-37).

However, Counts does not teach or suggest that the rod-shaped carrier device is operatively positioned such that, during draw, the mixture comprising the tobacco extract and the aerosol-forming material can be wicked into contact with the electrical resistance heater and volatilized to produce an aerosol.

Therefore the claimed invention is distinguished from the prior art of Counts.

Claims 31-50 are allowed.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is appropriate where the claims at issue are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the reference application or patent either is shown to

be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO internet Web site contains terminal disclaimer forms which may be used. Please visit http://www.uspto.gov/forms/. The filing date of the application will determine what form should be used. A web-based eTerminal Disclaimer may be filled out completely online using web-screens. An eTerminal Disclaimer that meets all requirements is auto-processed and approved immediately upon submission. For more information about eTerminal Disclaimers, refer to http://www.uspto.gov/patents/process/file/efs/guidance/eTD-info-I.jsp.

Claims 31-50 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-29 of U.S Patent No. 9901123, claims 1-25 of U.S Patent No. 9801416, claims 1-40 of U.S Patent No. 8899238, claims 1-35 of U.S. Patent No. 8079371 and claims 1-9 of Patent No. 7726320. Although the claims at issue are not identical, they are not patentably distinct from each other because they have the same scope of invention with the same features of a smoking article has an outer housing, an electrical power source, resistance heating element, puff actuated controller and a rod-shaped carrier device.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PHU NGUYEN whose telephone number is (571)272-5931. The examiner can normally be reached on M-F.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Wilson can be reached on 571-270-3882. 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.

/PHU NGUYEN/
Examiner, Art Unit 1747

Notice of References Cited	Application/Control No. 15/879,268	Applicant(s)/Patent Under Reexamination ROBINSON ET AL.	
	Examiner PHU NGUYEN	Art Unit 1747	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-5,692,525 A	12-1997	Counts; Mary Ellen	A24F47/008	131/194
	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	CPC 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.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15879268	ROBINSON ET AL.
	Examiner	Art Unit
	PHU NGUYEN	1747

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

SEARCH NOTES		
Search Notes	Date	Examiner
See East Search History	3/19/2018	P.N

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
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L3	33	(("9901123") or ("9801416") or ("8899238") or ("8079371") or ("7726320")).PN.	US-PGPUB; USPAT; USOCR; EPO; DERWENT	OR	OFF	2018/05/23 00:11
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S19	38	S18 and cartridge	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2014/01/28 16:59
S20	29	A24F47/$ and cartridge and substrate	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2014/01/28 17:00
S22	4	(("20120060853") or ("7726320")).PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2014/01/28 17:02
S24	21	A24F$/$ and polyethylene near2 terephthalate and electronic	US-PGPUB; USPAT; USOCR;	OR	ON	2014/01/29 17:14

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			EPO; JPO; DERWENT			
S27	18	polyethylene near2 terephthalate and electronic and absorbent and tobacco and smoking	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2014/01/29 17:17
S28	359	("20030131859" | "20040173229" | "20050016549" | "20050066986" | "20060185687" | "20060196518" | "20070062549" | "3258015" | "3356094" | "3516417" | "3614956" | "3738374" | "3844294" | "3878850" | "3931824" | "3943941" | "4044777" | "4079742" | "4190046" | "4219031" | "4233993" | "4284089" | "4286604" | "4326544" | "4340072" | "4347855" | "4391285" | "4635651" | "4700727" | "4714082" | "4735217" | "4756318" | "4771795" | "4793365" | "4800903" | "4807809" | "4819665" | "4823817" | "4836225" | "4848374" | "4874000" | "4892109" | "4893639" | "4917121" | "4917128" | "4920990" | "4924886" | "4947874" | "4961438" | "4966171" | "4969476" | "4972855" | "4977908" | "4991606" | "5020548" | "5025814" | "5033483" | "5040551" | "5050621" | "5060667" | "5060671" | "5060676" | "5065776" | "5072744" | "5074321" | "5076296" | "5076297" | "5092353" | "5099861" | "5101839" | "5105835" | "5105836" | "5105837" | "5105838" | "5115820" | "5146934" | "5148821" | "5159940" | "5159942" | "5178167" | "5183062" | "5203355" | "5211684" | "5224498" | "5240014" | "5240016" | "5271419" | "5285798" | "5293883" | "5327917" | "5345955" | "5357984" | "5360023" | "5369723" | "5388574" | "5396911" | "5533530" | "5551451" | "5588446" | "5593792" | "5595577" | "5598868" | "5692525" | "5715844" | "5743251" | "5778899" | "5799663" | "5819751" | "5829453" | "5865185" | "5878752" | "5880439" | "5915387" | "5934289" | "6033623" | "6053176" | "6089857" | "6095152" | "6146934" | "6164287" | "6182670" | "6234167" | "6289898" | "6397852" | "6408856" | "6516796" | "6532965" | "6537186" | "6578584" | "6591841" | "6598607" | "6615840" | "6730832" | "6823873" | "7117867").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2014/01/29 17:17
S31	713	(polyethylene near2 terephthalate near2 fiber) same (carbon near2 fiber)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2014/01/29 17:20
S32	12	(polyethylene near2 terephthalate near2 fiber) same (carbon near2 fiber) and base near2 web	US-PGPUB; USPAT;	OR	ON	2014/01/29 17:20

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			USOCR; EPO; JPO; DERWENT			
S33	65	(polyethylene near2 terephthalate near2 fiber) same (carbon near2 fiber) and absorbent	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2014/01/29 17:34
S34	28	(polyethylene near2 terephthalate near2 fiber) same bio	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2014/02/02 00:35
S38	2	("3486508").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2014/02/02 01:31
S40	22	A24F$/$ and paper same "metallic foil"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2014/02/02 01:32
S42	14	A24F$/$ and paper and base near2 web and calcium near carbonate	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2014/02/03 15:41
S43	2	("8079371").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2014/02/03 21:22
S44	7	cigarette near2 paper and carbon near2 fiber and carbon near2 particle and carbonate near2 particle	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2014/08/02 23:31
S45	0	(A24B15/165).cpc. and controller and aerosol and heater	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2014/08/02 23:32
S46	2	(A24B15/14).cpc. and controller and aerosol and heater	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2014/08/02 23:32
S47	0	(A24D1/18).cpc. and controller and aerosol and heater	US-PGPUB; USPAT;	OR	ON	2014/08/02 23:33

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			USOCR; EPO; JPO; DERWENT			
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S50	1	S49 and glycerin and (electrical electronic) and controller	US-PGPUB; USPAT; USOCR	OR	ON	2014/09/30 00:00
S53	122	smoking near2 article and tobacco near extract and heater	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2016/10/02 20:40
S54	2	("8899238").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2016/10/02 21:47
S55	0	(smoking and puff and carrier and wick and heater and controller).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2016/10/02 21:55
S56	1	(smoking and puff and carrier and wick$3 and heater and controller).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2016/10/02 21:55
S58	4	(("7726320") or ("8899238")).PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2017/04/01 01:42
S59	2	("20150047656").PN.	US-PGPUB;	OR	OFF	2017/04/01 01:46

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			USPAT; USOCR; EPO; JPO; DERWENT			
S60	6	(("7726320") or ("8899238") or ("8079371")).PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2017/04/01 02:00
S61	2	("20150047656").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2017/04/01 13:33
S62	2	(smoking and puff and carrier and wick$3 and heater and controller).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2017/04/01 13:46
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		"20140253144" | "20140261408" | "20140261486" | "20140261487" | "20140261495" | "20140270727" | "20140270729" | "20140270730" | "20140345631" | "3200819" | "3258015" | "3486508" | "3516417" | "3614956" | "3738274" | "3766000" | "3844294" | "3878850" | "3931824" | "3943941" | "4044777" | "4079742" | "4190046" | "4219031" | "4233993" | "4284089" | "4286604" | "4303083" | "4326544" | "4340072" | "4347855" | "4391285" | "4636561" | "4700727" | "4714082" | "4735217" | "4756318" | "4771995" | "4793365" | "4800903" | "4807809" | "4819665" | "4823817" | "4836225" | "4848374" | "4874000" | "4892109" | "4893639" | "4907606" | "4917121" | "4917128" | "4920990" | "4922901" | "4924886" | "4945931" | "4947874" | "4947875" | "4961438" | "4966171" | "4969476" | "4972855" | "4977908" | "4981522" | "4986286" | "5019122" | "5042510" | "5093894" | "5159942" | "5178167" | "5183062" | "5203355" | "5211684" | "5224498" | "5240014" | "5240016" | "5249586" | "5261424" | "5271419" | "5285798" | "5293883" | "5322075" | "5327917" | "5345955" | "5353813" | "5357984" | "5360023" | "5369723" | "5372148" | "5388594" | "5396911" | "5408574" | "5468936" | "5498850" | "5505214" | "5515842" | "5530225" | "5533530" | "5564442" | "5588446" | "5593792" | "5595577" | "5598868" | "5649554" | "5665262" | "5666977" | "5687746" | "5692525" | "5715844" | "5726421" | "5727571" | "5743251" | "5778899" | "5799663" | "5819751" | "5819756" | "5829453" | "5865185" | "5865186" | "5878752" | "5880439" | "5894841" | "5915387" | "5934289" | "5954979" | "5967148" | "0551451" | "6033623" | "6040560" | "6053176" | "6089857" | "6095152" | "6095153" | "6125853" | "6146287" | "6155268" | "6164287" | "6182670" | "6196218" | "6196219" | "6234167" | "6289898" | "6397852" | "6408856" | "6516796" | "6532965" | "6537186" | "6578584" | "6591841" | "6598607" | "6601776" | "6615840" | "6688313" | "6730832" | "6772756" | "6803546" | "6823873" | "6854461" | "6854470" | "6994096" | "7117867" | "7293565" | "7513253" | "7775459" | "7832410" | "7845359" | "7896006" | "8127772" | "8314591" | "8365742" | "8402976" | "8499766" | "8528569" | "8550069").PN.				
S65	7	S64 and carrier and wick and extract and mainstream and cartridge	US-PGPUB; USPAT; USOCR; FPRS;	OR	ON	2017/06/20 00:04

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			EPO; JPO; DERWENT			
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S69	3	("5666978").PN.	US-PGPUB; USPAT; USOCR; EPO; DERWENT	OR	OFF	2018/01/12 00:27
S70	76	ep near2 "0503767"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2018/01/12 00:28
S71	3	ep near2 "2949114"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2018/01/12 00:30
S74	3	"15286087"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2018/03/19 10:20
S77	9	"14527287"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2018/03/19 10:21

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Complete if Known	
				Application Number	*To Be Assigned*
				Filing Date	*Concurrently Herewith*
				First Named Inventor	John Howard Robinson
				Art Unit	*To Be Assigned*
				Examiner Name	*To Be Assigned*
Sheet	1	of	13	Attorney Docket Number	**R60999 1400US.C5 (1777.4)**

U. S. PATENT DOCUMENTS					
Examiner Initials*	Cite No.	Document Number Number - Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages of Relevant Figures Appear
	1	US-1,514,682	11-11-1924	Wilson	
	2	US-1,771,366	07-22-1930	Wyss et al.	
	3	US-2,057,353	10-13-1936	Whittemore, Jr.	
	4	US-2,104,266	01-04-1938	McCormick	
	5	US-3,200,819	08-17-1965	Gilbert	
	6	US-3,258,015	06-28-1966	Ellis et al.	
	7	US-3,356,094	12-05-1967	Ellis et al.	
	8	US-3,479,561	11-18-1969	Janning	
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	10	US-3,516,417	06-23-1970	Moses	
	11	US-3,614,956	10-26-1971	Thornton	
	12	US-3,738,374	06-12-1973	Bennett	
	13	US-3,766,000	10-16-1973	Gibson	
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	15	US-3,878,850	04-22-1975	Gibson et al.	
	16	US-3,931,824	01-13-1976	Miano et al.	
	17	US-3,943,941	03-16-1976	Boyd et al.	
	18	US-4,044,777	08-30-1977	Boyd et al.	
	19	US-4,079,742	03-21-1978	Rainer et al.	
	20	US-4,190,046	02-26-1980	Virag	
	21	US-4,219,031	08-26-1980	Rainer et al.	
	22	US-4,233,993	11-18-1980	Miano et al.	
	23	US-4,284,089	08-18-1981	Ray	
	24	US-4,286,604	09-01-1981	Ehretsmann et al.	

Examiner Signature		Date Considered	

*Examiner: Initial if reference 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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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /P.H.N/

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Complete if Known	
				Application Number	*To Be Assigned*
				Filing Date	*Concurrently Herewith*
				First Named Inventor	John Howard Robinson
				Art Unit	*To Be Assigned*
				Examiner Name	*To Be Assigned*
Sheet	2	of	13	Attorney Docket Number	**R60999 1400US.C5 (1777.4)**

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	26	US-4,326,544	04-27-1982	Hardwick et al.	
	27	US-4,340,072	07-20-1982	Bolt et al.	
	28	US-4,347,855	09-07-1982	Lanzillotti et al.	
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	263	US-2012/0260927	10-18-2012	Liu	
	264	US-2012/0279512	11-08-2012	Hon	
	265	US-2012/0318882	12-20-2012	Abehasera	
	266	US-2013/0037041	02-14-2013	Worm et al.	
	267	US-2013/0056013	03-07-2013	Terry et al.	

Examiner Signature		Date Considered	

*Examiner: Initial if reference 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.

ELECTRONICALLY FILED USING THE EFS-WEB ELECTRONIC FILING SYSTEM OF THE UNITED STATES PATENT AND TRADEMARK OFFICE ON JANUARY 24, 2018.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /P.H.N/

RAI Exhibit 2008
Ecto World v. RAI
PGR2024-00049
Page 168

INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Complete if Known	
				Application Number	*To Be Assigned*
				Filing Date	*Concurrently Herewith*
				First Named Inventor	John Howard Robinson
				Art Unit	*To Be Assigned*
				Examiner Name	*To Be Assigned*
Sheet	11	of	13	Attorney Docket Number	**R60999 1400US.C5 (1777.4)**

U. S. PATENT DOCUMENTS					
	268	US-2013/0081625	04-04-2013	Rustad et al.	
	269	US-2013/0081642	04-04-2013	Safari	
	270	US-2013/0192619	08-01-2013	Tucker et al.	
	271	US-2013/0255702	10-03-2013	Griffith, Jr. et al.	
	272	US-2013/0306084	11-21-2013	Flick	
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	284	US-2014/0253144	09-11-2014	Novak et al.	
	285	US-2014/0261408	09-18-2014	DePiano et al.	
	286	US-2014/0261486	09-18-2014	Potter et al.	
	287	US-2014/0261487	09-18-2014	Chapman et al.	
	288	US-2014/0261495	09-18-2014	Novak et al.	
	289	US-2014/0270727	09/18/2014	Ampolini et al.	
	290	US-2014/0270729	09/18/2014	DePiano et al.	
	291	US-2014/0270730	09/18/2014	DePiano et al.	
	292	US-2014/0345631	11-27-2014	Bowen et al.	

FOREIGN PATENT DOCUMENTS

Examiner Signature		Date Considered	

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RAI Exhibit 2008
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Complete if Known	
				Application Number	*To Be Assigned*
				Filing Date	*Concurrently Herewith*
				First Named Inventor	John Howard Robinson
				Art Unit	*To Be Assigned*
				Examiner Name	*To Be Assigned*
Sheet	12	of	13	Attorney Docket Number	**R60999 1400US.C5 (1777.4)**

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.	Foreign Patent Document Country Code - Number Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	English Language Translation Attached
	293	GB 755,475	08-22-1956	Peterson		
	294	AU 276250	07-08-1965	Battelle Memorial Institute		
	295	GB 1 431 045	04-07-1976	Porter et al.		
	296	GB 2 070 409	09-09-1981	British-American Tobacco Company, Limited		
	297	EP 0 295 122	12-14-1988	Imperial Tobacco Limited		
	298	EP 0 430 559 A2	06-05-1991	Philip Morris Products, Inc.		
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	301	WO 97/48293	12-24-1997	Japan Tobacco Inc.		
	302	WO 98/16125	04-23-1998	Rothmans, Benson & Hedges, Inc.		
	303	EP 0 845 220	06-03-1998	Japan Tobacco Inc.		
	304	JP 2949114	09-13-1999	Japan Tobacco Inc.; Nippon Tabako Sangyo KK		
	305	WO 02/37990 A2	05-16-2002	Vector Tobacco (Bermuda) Ltd.		
	306	WO 2004/095955 A1	03-08-2004	Best Partners Worldwide Limited		
	307	WO 2004/080216 A1	09-23-2004	Hon, Lik		
	308	CN 1541577	11-03-2004	HAN, Li		
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Examiner Signature		Date Considered	

*Examiner: Initial if reference 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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INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Complete if Known	
				Application Number	*To Be Assigned*
				Filing Date	*Concurrently Herewith*
				First Named Inventor	John Howard Robinson
				Art Unit	*To Be Assigned*
				Examiner Name	*To Be Assigned*
Sheet	13	of	13	Attorney Docket Number	**R60999 1400US.C5 (1777.4)**

FOREIGN PATENT DOCUMENTS						
	310	CN 2719043	08-24-2005	HAN, Li		
	311	EP 1 618 803 A1	01-25-2006	Hon, Lik		
	312	WO 2007/078273	07-12-2007	Liu		
	313	DE 10 2006 004 484	08-09-2007	Schmidt, Karsten		
	314	WO 2007/131449	11-22-2007	Han		

OTHER DOCUMENTS			
Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s) , volume-issue number(s), publisher, city and/or country where published.	English Language Translation Attached
	315	LU, ZHANG, "Safe Substitute", China Daily, July 11, 2005.	
	316	Chemical and Biological Studies on New Cigarette Prototypes that Heat Instead of Burn Tobacco, R. J. Reynolds Tobacco Company Monograph, 1988, pp. 43-72.	
	317	Inhalation Technology, Dr. Donald E. Garden, ed., Vol. 12, No. 5, pp. 1-58, (2000).	
	318	Extended European Search Report, EP 17 18 5645, mailed November 28, 2017.	

Examiner Signature	/PHU H NGUYEN/	Date Considered	05/22/2018

*Examiner: Initial if reference 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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Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15879268	ROBINSON ET AL.
	Examiner	**Art Unit**
	PHU NGUYEN	1747

✓	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	03/19/2018								
	31	✓								
	32	✓								
	33	✓								
	34	✓								
	35	✓								
	36	✓								
	37	✓								
	38	✓								
	39	✓								
	40	✓								
	41	✓								
	42	✓								
	43	✓								
	44	✓								
	45	✓								
	46	✓								
	47	✓								
	48	✓								
	49	✓								
	50	✓								

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/879,268	01/24/2018	John Howard Robinson	R60999 1400US.C5 (1777.4)

CONFIRMATION NO. 9513

26158
WOMBLE BOND DICKINSON (US) LLP
ATTN: IP DOCKETING
P.O. BOX 7037
ATLANTA, GA 30357-0037

PUBLICATION NOTICE



Title:TOBACCO-CONTAINING SMOKING ARTICLE

Publication No.US-2018-0146713-A1
Publication Date:05/31/2018

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 Public Records Division. The Public Records Division can be reached by telephone at (571) 272-3150 or (800) 972-6382, by facsimile at (571) 273-3250, by mail addressed to the United States Patent and Trademark Office, Public Records Division, 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 https://portal.uspto.gov/pair/PublicPair. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

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

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PTO/SB/06 (09-11)
Approved for use through 1/31/2014. 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 15/879,268	Filing Date 01/24/2018	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	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 $310 ($155 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	

APPLICATION AS AMENDED – PART II

AMENDMENT **08/30/2018**

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 20	Minus	** 20	= 0	X $100 =	0
Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	X $460 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	0

AMENDMENT

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

SLIE
ALA HUNTER

This collection of information is required by 37 CFR 1.16. 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, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: 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.

Doc Code: DIST.E.FILE **Document Description: Electronic Terminal Disclaimer - Filed**	PTO/SB/26 U.S. Patent and Trademark Office Department of Commerce

Electronic Petition Request	**TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT**
Application Number	15879268
Filing Date	24-Jan-2018
First Named Inventor	John Robinson
Attorney Docket Number	R60999 1400US.C5 (1777.4)
Title of Invention	TOBACCO-CONTAINING SMOKING ARTICLE

☒ Filing of terminal disclaimer does not obviate requirement for response under 37 CFR 1.111 to outstanding Office Action

☒ This electronic Terminal Disclaimer is not being used for a Joint Research Agreement.

Owner	Percent Interest
RAI Strategic Holdings, Inc.	100%

The owner(s) with percent interest listed above in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of prior patent number(s)

7726320

8079371

8899238

9801416

9901123

as the term of said prior patent is presently shortened by any terminal disclaimer. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the owner does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the prior patent, "as the term of said prior patent is presently shortened by any terminal disclaimer," in the event that said prior patent later:
- expires for failure to pay a maintenance fee;
- is held unenforceable;
- is found invalid by a court of competent jurisdiction;
- is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
- has all claims canceled by a reexamination certificate;
- is reissued; or
- is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

(●) Terminal disclaimer fee under 37 CFR 1.20(d) is included with Electronic Terminal Disclaimer request.

( ) I certify, in accordance with 37 CFR 1.4(d)(4), that the terminal disclaimer fee under 37 CFR 1.20(d) required for this terminal disclaimer has already been paid in the above-identified application.

Applicant claims the following fee status:

( ) Small Entity

( ) Micro Entity

(●) Regular Undiscounted

I hereby 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 issued thereon.

THIS PORTION MUST BE COMPLETED BY THE SIGNATORY OR SIGNATORIES

I certify, in accordance with 37 CFR 1.4(d)(4) that I am:

(●) An attorney or agent registered to practice before the Patent and Trademark Office who is of record in this application

Registration Number 69344

( ) A sole inventor

( ) A joint inventor; I certify that I am authorized to sign this submission on behalf of all of the inventors as evidenced by the power of attorney in the application

( ) A joint inventor; all of whom are signing this request

Signature	/lauren f. anderson/
Name	Lauren F. Anderson

*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).
Form PTO/SB/96 may be used for making this certification. See MPEP § 324.

Electronic Patent Application Fee Transmittal

Application Number:	15879268
Filing Date:	24-Jan-2018
Title of Invention:	TOBACCO-CONTAINING SMOKING ARTICLE
First Named Inventor/Applicant Name:	John Howard Robinson
Filer:	Lauren F Anderson/Shari Elofson
Attorney Docket Number:	R60999 1400US.C5 (1777.4)

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
STATUTORY OR TERMINAL DISCLAIMER	1814	1	160	160
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**160**

Doc Code: DISQ.E.FILE
Document Description: Electronic Terminal Disclaimer – Approved

Application No.: 15879268

Filing Date: 24-Jan-2018

Applicant/Patent under Reexamination: Robinson

Electronic Terminal Disclaimer filed on August 30, 2018

☒ APPROVED

This patent is subject to a terminal disclaimer

☐ DISAPPROVED

Approved/Disapproved by: Electronic Terminal Disclaimer automatically approved by EFS-Web

U.S. Patent and Trademark Office

Electronic Acknowledgement Receipt

EFS ID:	33590988
Application Number:	15879268
International Application Number:	
Confirmation Number:	9513
Title of Invention:	TOBACCO-CONTAINING SMOKING ARTICLE
First Named Inventor/Applicant Name:	John Howard Robinson
Customer Number:	26158
Filer:	Lauren F Anderson/Shari Elofson
Filer Authorized By:	Lauren F Anderson
Attorney Docket Number:	R60999 1400US.C5 (1777.4)
Receipt Date:	30-AUG-2018
Filing Date:	24-JAN-2018
Time Stamp:	17:39:58
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$160
RAM confirmation Number	083118INTEFSW00004726090528
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Terminal Disclaimer-Filed (Electronic)	eTerminal-Disclaimer.pdf	35192 1327b5a945751f70b3b8f363513fb4364768531c	no	3
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30631 5234fbf42fd9170778df27f63abcfe49df0102c7	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	65823		

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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.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re:	Robinson *et al.*	Confirmation No.:	9513
Appl. No.:	15/879,268	Group Art Unit:	1747
Filed:	January 24, 2018	Examiner:	Phu Hoang Nguyen
For:	TOBACCO-CONTAINING SMOKING ARTICLE		

Docket No.: R60999 1400US.C5 (1777.4)
Customer No.: 26158

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

RESPONSE UNDER 37 C.F.R. § 1.111

Sir:

In response to the Office Action dated May 30, 2018:

Pending Claims are reflected in the listing of claims beginning on page 2 of this paper.

Remarks/Arguments begin on page 6 of this paper.

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Pending Claims

1. – 30. (Canceled)

31. (Previously Presented) An aerosol generating smoking article comprising:

an outer housing;

an electrical resistance heater configured for electrical connection with an electrical power source;

a substrate carrier positioned in a first segment of the outer housing, the substrate carrier including an aerosol-generating material; and

tobacco positioned in a second segment of the outer housing;

wherein the substrate carrier is operatively positioned such that the aerosol-generating material can be wicked into contact with the electrical resistance heater for volatilization to produce an aerosol; and

wherein the tobacco is operatively positioned such that the produced aerosol can be drawn through the tobacco and into the mouth of a user of the smoking article.

32. (Previously Presented) The aerosol generating smoking article of claim 31, wherein the aerosol-generating material comprises glycerin, propylene glycol, or a mixture thereof.

33. (Previously Presented) The aerosol generating smoking article of claim 31, wherein the tobacco is incorporated within a cartridge.

34. (Previously Presented) The aerosol generating smoking article of claim 33, wherein the cartridge is formed of a plastic material.

35. (Previously Presented) The aerosol generating smoking article of claim 31, wherein the tobacco includes a flavoring material.

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36. (Previously Presented) The aerosol generating smoking article of claim 35, wherein the flavoring material includes menthol.

37. (Previously Presented) The aerosol generating smoking article of claim 31, wherein the substrate carrier comprises a fibrous material.

38. (Previously Presented) The aerosol generating smoking article of claim 31, wherein the aerosol-generating material is positioned in fluid communication with the tobacco such that air drawn through the outer housing can be drawn through both the aerosol-generating material and the tobacco, thereby generating an aerosol that includes volatilized portions of the aerosol-generating material and volatilized components derived from the tobacco.

39. (Previously Presented) The aerosol generating smoking article of claim 31, further comprising a puff-actuated controller adapted for regulating current flow through the electrical resistance heater during draw, the controller comprising a sensor adapted for sensing draw on the aerosol generating smoking article by the user.

40. (Previously Presented) The aerosol generating smoking article of claim 31, wherein the tobacco is at least partially supported in a mouth-end piece that is removably attached to the outer housing.

41. (Previously Presented) The aerosol generating smoking article of claim 40, wherein the mouth-end piece includes a filter element.

42. (Previously Presented) The aerosol generating smoking article of claim 31, wherein the tobacco is in the form of pieces or pellets.

43. (Previously Presented) An aerosol generating smoking article comprising:

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a tubular outer housing having a mouth-end and an end distal to the mouth-end;

an electrical power source;

an electrical resistance heater within the tubular outer housing in electrical connection with the electrical power source;

a puff-actuated controller adapted for regulating current flow through the electrical resistance heater during draw, the controller comprising a sensor adapted for sensing draw on the aerosol generating smoking article by a user;

a substrate carrier that is an adsorbent material with an aerosol-generating material absorbed therein, wherein the substrate carrier is operatively positioned such that the aerosol-generating material can be wicked into contact with the electrical resistance heater for volatilization to produce an aerosol; and

a mouth-end piece removably positioned at the mouth-end of the tubular outer housing, the mouth-end piece at least partially supporting a tobacco material.

44. (Previously Presented) The aerosol generating smoking article of claim 43, wherein the aerosol-generating material comprises glycerin, propylene glycol, or a mixture thereof.

45. (Previously Presented) The aerosol generating smoking article of claim 43, wherein the mouth-end piece is formed of a plastic material.

46. (Previously Presented) The aerosol generating smoking article of claim 43, wherein the tobacco material includes a flavoring material.

47. (Previously Presented) The aerosol generating smoking article of claim 46, wherein the flavoring material includes menthol.

48. (Previously Presented) The aerosol generating smoking article of claim 43, wherein the substrate carrier comprises a fibrous material.

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49. (Previously Presented) The aerosol generating smoking article of claim 43, wherein the aerosol-generating material is positioned in fluid communication with the tobacco material such that air drawn through the outer housing can be drawn through both the aerosol-generating material and the tobacco material, thereby generating an aerosol that includes volatilized portions of the aerosol-generating material and volatilized components derived from the tobacco material.

50. (Previously Presented) The aerosol generating smoking article of claim 43, wherein the mouth-end piece includes a filter element.

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REMARKS/ARGUMENTS

Reexamination and reconsideration of this application, withdrawal of the rejections, and formal notification of the allowability of all claims as presented are earnestly solicited in light of the remarks that follow. Claims 1-30 were previously canceled. Claims 31-50 remain pending following this Response. Applicant submits that no new matter is added by way of this Response.

Allowed Subject Matter

Applicant thanks the Examiner for the allowance of Claims 31-50.

Double Patenting

Claims 31-50 are indicated as allowed in the Office Action, but are also indicated as being rejected on the ground of nonstatutory double patenting as being unpatentable over Claims 1-29 of U.S. Patent No. 9,901,123 (the '123 Patent), Claims 1-25 of U.S. Patent No. 9,801,416 (the '416 Patent), Claims 1-40 of U.S. Patent No. 8,899,238 (the '238 Patent), Claims 1-35 of U.S. Patent No. 8,079,371 (the '371 Patent), and Claims 1-9 of U.S. Patent No. 7,726,320 (the '320 Patent).

Although Applicant does not acquiesce to the rejections, in order to expedite allowance, Applicant has filed an electronic terminal disclaimers for the '123 Patent, the '416 Patent, the '238 Patent, the '371 Patent, and the '320 Patent. Applicant submits that the double patenting rejection is thus moot, and Applicant requests reconsideration and withdrawal of the rejection.

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CONCLUSION

Electronic terminal disclaimers have been submitted herewith. Therefore, it is respectfully submitted that Claims 31-50 are in condition for allowance.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefor (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 09-0528.

Respectfully submitted,

/lauren f. anderson/

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Attorney's Docket No. **R60999 1400US.C5 (1777.4)** PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re:	Robinson *et al.*	Confirmation No.:	9513
Appl. No.:	15/879,268	Group Art Unit:	1747
Filed:	January 24, 2018	Examiner:	Phu Hoang Nguyen
For:	TOBACCO-CONTAINING SMOKING ARTICLE		

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

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT UNDER 37 C.F.R. § 1.97(c)

Sir:

Attached is a list of documents on form PTO-1449 along with a copy of any cited foreign patent documents and non-patent literature document in accordance with 37 CFR 1.98(a)(2). Also enclosed is a translation or a concise explanation of each non-English language document.

It is requested that the Examiner consider these documents and officially make them of record in accordance with the provisions of 37 C.F.R. § 1.97 and Section 609 of the MPEP. By identifying the listed documents, Applicant in no way makes any admission as to the prior art status of the listed documents, but is instead identifying the listed documents for the sake of full disclosure.

This Information Disclosure Statement is submitted in accordance with 37 C.F.R. § 1.97(c), before final Office Action or Allowance, whichever is earlier. The Commissioner is authorized to charge the $240.00 fee specified in 37 C.F.R. § 1.17(p) and any additional fee, or credit any refund, to our Deposit Account No. **09-0528**.

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				Filing Date	January 24, 2018
				First Named Inventor	John Howard Robinson
				Art Unit	1747
				Examiner Name	Phu Hoang Nguyen
Sheet	1	of	6	Attorney Docket Number	**R60999 1400US.C5 (1777.4)**

U. S. PATENT DOCUMENTS					
Examiner Initials*	Cite No.	Document Number Number - Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages of Relevant Figures Appear
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Examiner Signature		Date Considered	

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				Art Unit	1747
				Examiner Name	Phu Hoang Nguyen
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				Examiner Name	Phu Hoang Nguyen
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Examiner Signature		Date Considered	

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Examiner Initials*	Cite No.	Foreign Patent Document Country Code - Number Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	English Language Translation Attached
	419	GB 191125575 A	03/28/1912	Hill		
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Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s) , volume-issue number(s), publisher, city and/or country where published.	English Language Translation Attached
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Sheet	6	of	6	Attorney Docket Number	**R60999 1400US.C5 (1777.4)**

OTHER DOCUMENTS			
Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s) , volume-issue number(s), publisher, city and/or country where published.	English Language Translation Attached
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N° 25,575 A.D. 1911

Date of Application, 16th Nov., 1911—Accepted, 28th Mar., 1912

COMPLETE SPECIFICATION.

Improvements in Inhalers, Respirators and the like.

I, ELWIN KENDAL HILL, of Penn Building, Cleveland, County of Cuyahoga, State of Ohio, United States of America, Manufacturer, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to inhalers, respirators and analagous instruments adapted for use in the treatment of the respiratory organs with medicated vapours, for protecting such organs from the injurious effects of a foul or impure atmosphere, and for similar purposes, and contemplates certain important improvements on that kind of instrument which comprises a hood for application to the face, a vaporizing pad heated by a manually-controlled electric current and valve-controlled inlets and outlets for respectively admitting and exhausting the air.

It has hitherto been proposed in vaporizers for fumigating, perfuming and like purposes to partially immerse porous blocks in a receptacle containing the liquid to be vaporized, the liquid thus absorbed being heated by electricity to accelerate the vaporization.

The chief object of my present invention is to provide an inhaler or like device which shall be capable of being used both conveniently and effectively.

To the above end I essentially contemplate a hand appliance embodying in combination a hood for application to the face of the user, a vaporizer arranged in co-operative relation to the hood and a reservoir for automatically supplying a medicament to the vaporizer.

A further and important feature of the invention is to provide as a unit a reservoir for containing the medicament and a vaporizer having means for feeding the medicament thereto automatically from the reservoir, units of this character being adapted to be used interchangeably in connection with the instrument as above indicated. The principal advantage attaching to this feature is that one instrument comprising the hood, handle and associated parts may be used for the treatment of different diseases, a number of units may be at hand each containing an appropriate medicament and these units may be employed interchangeably with the body of the instrument. In the operation of the improved device as will be appreciated hereinafter it is merely necessary for the user to supply the reservoir with a sufficient quantity of the liquid and the self-feeding action aforementioned renders it unnecessary for attention to be paid to the feeding of the medicament to the vaporising pad.

The invention is further characterised by the fact that the construction of the reservoir is such that it will feed the medicament to the vaporising pad irrespective of the position of the instrument, and that provision is made to prevent spilling or leakage of the liquid from the reservoir in all positions of the latter.

With regard to the electrically heating device for the vaporiser I contemplate arranging this in such a manner that the terminals thereof extend through to the exterior of the reservoir wall. The ends of the coil which is suitably wound or coiled in the vaporising pad are attached to pins which pass through the wall of the reservoir as indicated and are permanently connected there by external contacts.

The foregoing are regarded as the most important features of the invention

[*Price* 8*d*.]

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(others of which are recited hereinafter and in the appended claims) and in order that the invention may be clearly comprehended in its several aspects I will now proceed to describe the same with reference to the accompanying drawings in which by way of example;

Figure 1 is a front elevation of an instrument constructed in accordance with the preferred embodiment of my invention;

Figure 2 represents a central vertical section through the part of the instrument as shown in Figure 1;

Figure 3 is a detail sectional view to an enlarged scale of the vaporising and reservoir member and also showing a portion of the instrument to which this member is adapted to be removably attached.

Figure 4 is a face view of the detachable and interchangeable vaporising and reservoir member.

Figure 5 is a detail view of the electric switch used for controlling the current which heats the vaporising means; and

Figure 6 is a detail enlarged view of the electric heating element for the vaporising means.

Similar parts are designated by the same reference characters in the several views.

In the accompanying drawing, the instrument comprises a hood 1 which is properly shaped to fit the face of a person so as to enclose the mouth and also the nose, and a handle 2 is provided whereby the user may hold the instrument in proper position. To facilitate manipulation of the instrument, the hood is preferably connected pivotally to the handle whereby the angular relation between the hood and the handle may be varied. For this purpose, the handle is provided at its upper end with a yoke 3 having a pair of arms 4 which are connected to opposite sides of the hood by the pivots 5. The handle in the present instance is provided with means for controlling an electric current which serves to heat the vaporiser for the medicament. In the construction shown, the electric conducting wires 6 extend upwardly through the handle which is formed with a bore for this purpose and one of these wires 7 extends without interruption through a tube 8. The tube 8 serves as one of the terminals of a switch and is hence connected to one of the wires of the conducting cord 6. The other terminal or contact of the switch comprises a member 9 which is reciprocable transversely with respect to the arms 4 and is provided at one end with a press button 10 whereby it may be operated to control the electric circuit. The middle portion of this member 9 is ring-like so as to clear the centre of the tube 8 and it has a pair of divergently arranged resilient arms or wires 11 which when the button 10 is pressed are caused to bear against opposite sides of the tube 8 and thereby close a circuit therethrough, the divergent arrangement of these resilient wires producing a wiping effect which will prevent corrosion of the contact surfaces. A wire 12 leads from the switch member 9 and this wire 12 as well as the wire 7 is provided with slightly expansible eyes 13 which are adapted to be connected to the terminals of the heating means for the vaporiser. The wires 7 and 12 are preferably composed of flexible conductors so that they will not interfere with the tilting movements of the hood or upper part of the instrument with respect to the handle.

The rear portion of the hood 1 is formed with a wall 14 which has an annular row of perforations 15 adjacent to its periphery for the exit of air which is exhaled from the respiratory organs, and a partition 16 is also arranged within the hood and is located in front of the rear wall 14, this partition having a similar annular row of perforations 17 for the exit of air. The partition 16 is held in proper spaced relation with respect to the rear wall 14 by an internal flange 18 which abuts against the rear side of the partition 16, and a sleeve 19 is fitted within the internal flange 18 and has its forward end headed over the internal circumference of the partition 16 as shown at 20 in Figure 2. In this way, displacement of the partition either in a forward or rearward direction is

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prevented and, moreover, the wall of the hood may also be crimped or reduced in size so as to confine the outer edge of the partition 16 as shown. The space provided between the rear wall 14 of the hood and the partition 16 forms a valve chamber 21 and this valve chamber contains a freely movable valve 22. This valve 22 is adapted to seat against the partition 16 so as to prevent the entrance of air through the perforations 15 and 17, but it is held from engaging the rear wall 14 of the hood, so as to permit exit of air through the perforations 15 and 17 by a limiting shoulder 23 which preferably projects rearwardly from the inner circumference of the valve.

The tube 19 provides a passage through which air whether purified or medicated enters the hood and this tube is provided with a valve which will permit the entrance of air to the hood through the tube but will not permit exit of air from the hood through the tube. In the present instance, a spider 24 is fixed within the tube 19, the spider having a stud 25 which projects rearwardly therefrom, a ring 26 is fixed within the tube immediately in rear of the spider 24, and a freely movable valve 27 is interposed between the spider 24 and the ring 26, it being supported in proper operative position by the rearwardly projecting stud 25. This valve will permit a flow of air through the tube and into the hood but will seat against the ring 26 and prevent exit of air from the hood through the tube. To prevent interference between air discharging from the hood through the perforations 15 and 17 and the fresh air being drawn into the hood from the atmosphere, a diaphragm in the form of an annular plate 28 is applied to the exterior of the tube 19, this diaphragm being held rigidly in proper position by spacing rings 29 applied to opposite sides thereof and secured on the exterior of the tube 19, the latter being also provided with suitable shoulders as shown for securing the different parts attached thereto in proper spaced relation. The rear end of the tube 19 projects from the hood a distance sufficient to adapt it for use as coupling means for the attachment of a vaporising device.

The present invention provides vaporising means which is capable of effectively medicating or purifying the air before it enters the hood and, moreover, the vaporising means is combined with a self-feeding reservoir for supplying the vaporising means with a suitable quantity of medicament without requiring the attention of the user. According to the present invention, the vaporising means, the reservoir, and the self-feeder are combined as a unit and any number of these units may be interchangeably used in connection with the instrument, hence enabling one instrument to be used in the treatment of different diseases and also to be used for various other purposes. Each of these units in the present embodiment of my invention comprises a reservoir composed principally of a bowl 30 made of glass or other suitable material and provided with a cap 31 which has a screw or other suitable detachable connection with the open end of the bowl, the cap being formed with an annular row of perforations 32 to permit the entrance of air to the bowl from the atmosphere and at the rear side of the diaphragm 28, and the cap is formed with a rearwardly projecting constricted or cone-shaped guard 33 which serves to concentrate the inflowing current of air upon the vaporising means. The cap 31 also secures a cover 34 in co-operative relation with the open end of the bowl, this cover having a liquid-tight connection with the bowl so as to prevent leakage of liquid therefrom and in the present instance a gasket 35 is interposed between the cover and the edge of the bowl to insure a tight joint at this point, the gasket being compressed by tightening of the screw cap 31. The cover 34 has a central opening which accommodates the guard 33 of the cap and also provides a passage 36 for the flow of a current of air around said guard. The cover 34 is also formed with an internal rearwardly projecting flange 37 which is preferably conical or constricted and this flange 37 prevents the escape or spilling of the contents of the bowl irrespective of the position occupied by the bowl. The flange 37 cooperating with the guard 33 also serves to concentrate the inflowing current

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of air upon the vaporising device. This vaporizing device comprises a disc or support 38 having a perforated cover 39 secured thereto and the space between the forward side of the disc 38 and the perforated cover 39 contains a mass 40 of absorbent material of a suitable character. This space just referred to also contains an electrical heating device which in the present instance embodies a heating coil 41 of suitable resistance to generate heat during the passage of an electric current therethrough, the heat thus generated by the coil causing rapid vaporization of the medicament contained in the absorbent mass or pad. The two terminals of the heating coil are connected to pins 42 and 43, these pins being passed rearwardly through the disc 38 and through sleeves 44 which support the disc in proper position, and such pins are provided with terminals to be hereinafter described on the exterior of the device. According to the present invention, the mass 40 of absorbent material is kept automatically supplied with a proper quantity of the liquid or medicament contained in the bowl by a suitable number of feeding cords or wicks 45, a suitable number of these wicks or cords being used which are spaced circumferentially within the bowl and are preferably secured to the interior thereof so that at least one of these wicks or feeding cords will be immersed in the liquid or medicament irrespective of the position occupied by the bowl. The inner ends of these cords or wicks are passed through an eyelet or tube 46 which is secured centrally of the disc 38 and the terminals of the cords or wicks enter the space between the disc 38 and the cover 39 so as to properly deliver the liquid or medicament to the absorbent mass or pad 40 therein. The vaporising device is secured within the bowl by a pair of discs 47 and 48, the disc 47 being placed within the bowl and abutting against the rear ends of the sleeves 44, while the disc 48 is applied to the exterior of the bowl, the discs being firmly clamped together by a screw 49, and a packing washer 50 of cork or other appropriate material is applied to fill the central opening in the bowl and thereby produce a fluid-tight joint at this point. The pins 42 and 43 to which the terminals of the electrical heating coil are connected extend through the disc 47 and the opening in the bowl 30 and also through the metallic sleeves 51 and 52 which are secured to the outer disc 48, these sleeves being preferably arranged divergently as shown in order to separate the terminals to the desired degree. The ends of the sleeves 51 and 52 project beyond the rear face of the disc 48 and have metal caps 53 and 54 fitted tightly thereover, the ends of the pins being secured preferably by soldering to the outer ends of the caps 53 and 54. These two caps just mentioned preferably taper slightly and they are adapted to receive the expansible eyes 13 on the conducting cords 7 and 12, the taper of the caps insuring good electrical contact and also preventing accidental disengagement of the conducting cords. The unit just described and comprising the vaporiser, the reservoir, and the self-feeder is adapted to be detachably connected to the remainder of the instrument. Different means may be provided for detachably connecting these parts. In the present instance the interior of the cap 32 is adapted to slidably fit over the projecting end of the sleeve 19 and has projections 55 adapted to engage the angular recesses 56 in the sleeve thus providing one form of bayonet joint to detachably unite these parts. In using the instrument, the vaporising of the medicament contained in the mass of absorbent material or pad 40 is controlled by the electric switch, the button 10 of the switch being depressed to close the electric circuit and thereby causing the electrical heating device of the vaporizer to heat the material and vaporize it to the desired degree. The degree of vaporization is obviously within the convenient control of the user. As the hood of the device is applied to the face of the user, the inhalations will cause the inlet valve 27 to open and the outlet valve 22 to close, a current of air being then drawn from the atmosphere through the passage 36 and this current of air is concentrated upon the vaporizing device which is centred at approximately the apex of the guard 33. This inflowing current of air will take up the medicated vapour and will flow therewith through

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the interior of the guard 33, thence through the tube 19 and the valve which at this time is open, and into the hood and from the latter, the medicated vapour is inhaled into the respiratory organs. Exhalation will cause a closing of the valve 27 and opening of the valve 22, waste of vapour by being blown into the atmosphere being thereby avoided and the exhaled air and vapour is discharged into the atmosphere through the perforations in the rear of the hood.

The device may be used as a respirator by removing the vaporizing attachment and using the hood and handle, the valves operating in the same manner as hereinbefore described. Also the same instrument can be used for the treatment of different diseases by substituting vaporizing devices containing medicaments of different kinds.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. An inhaler or like instrument comprising a hood adapted for application to the face of the user, a vaporizer arranged in co-operative relation to the hood and a reservoir for automatically supplying a medicament to said vaporizer.

2. In an inhaler having a hood adapted for application to the face of the user, a unit comprising a reservoir for containing the medicament and a vaporizer having means for feeding the medicament thereto automatically from the reservoir, said unit being detachably connected to the body of the inhaler.

3. In an inhaler having a hood, the combination of a vaporizer with a reservoir for automatically supplying a medicament thereto by liquid conductors arranged in the reservoir, the arrangement of the self-feeding means being such that the liquid will be supplied by the reservoir irrespective of the position thereof.

4. In an inhaler having a hood, the combination of a vaporizer, a reservoir for automatically supplying a medicament thereto and means for preventing spilling or leakage of the medicament from the reservoir irrespective of the position occupied thereby.

5. An inhaler having an automatically fed vaporizer and an electric heating device therefor having terminals extending through and arranged exteriorly of the reservoir, substantially as described.

6. An inhaler in which the automatically fed vaporizer is provided with an electrically heating coil the ends of which are attached to pins which pass through the wall of the reservoir and are permanently connected by external contacts.

7. An attachment for inhalers comprising a vaporizer, a reservoir for automatically feeding a liquid thereto, a cover for the reservoir having a flange projecting into the reservoir, and a cap applied to the reservoir and having a guard arranged within said flange to form a passage for conducting air to the vaporizer and for conducting air therefrom.

8. An inhaler or like device substantially as herein described and illustrated.

Dated this 16th day of November, 1911.

HASELTINE, LAKE & Co.,
7 & 8, Southampton Buildings, London, England, and
60, Wall Street, New York City, U.S.A.,
Agents for the Applicant.

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1912.

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A.D. 1911. Nov. 16. № 25,675.
HILL'S Complete Specification.

(2 SHEETS)

SHEET 1.

Fig. 1.

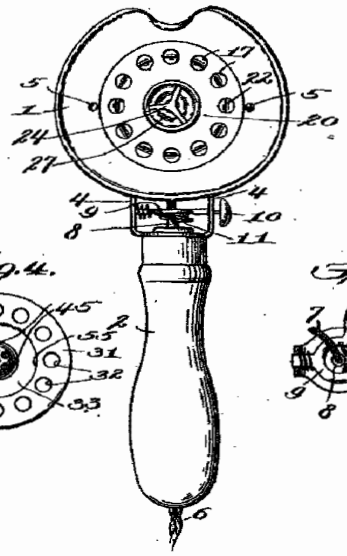
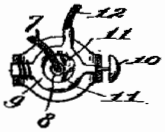


Fig. 4.

Fig. 5.



SHEET 2.

Fig. 2.

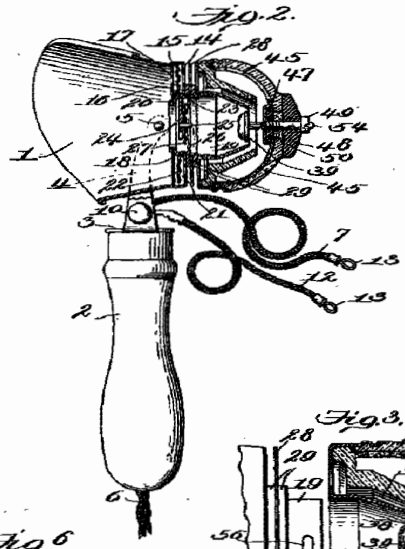


Fig. 3.

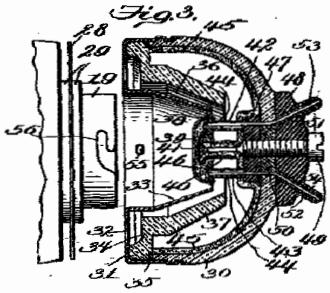
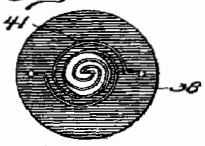


Fig. 6



[This Drawing is a reproduction of the Original on a reduced scale]

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Malby & Sons, Photo-Litho

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[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 1.

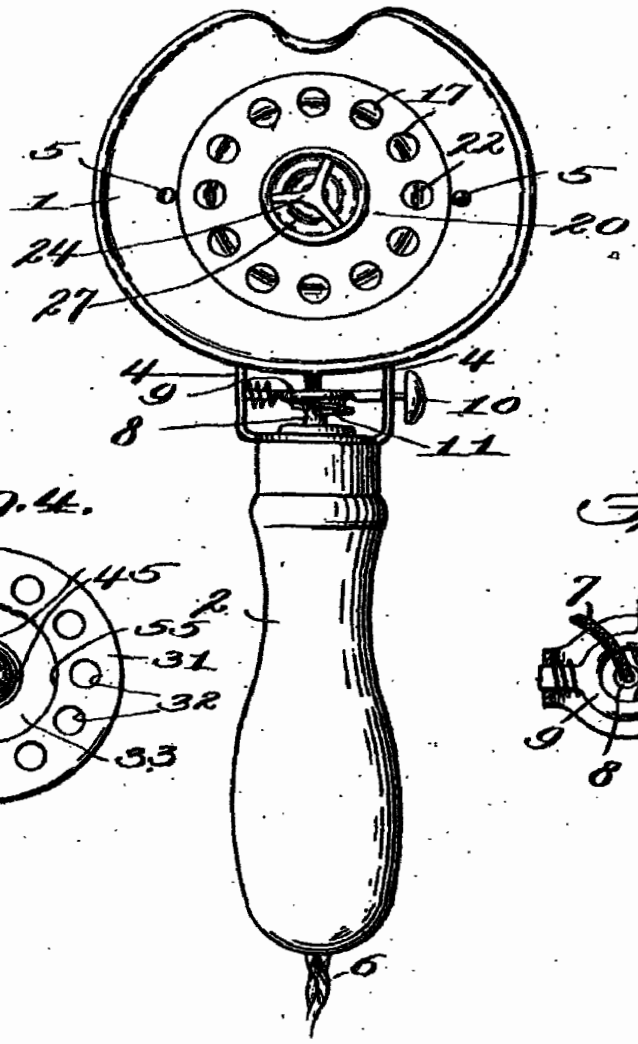


Fig. 4.

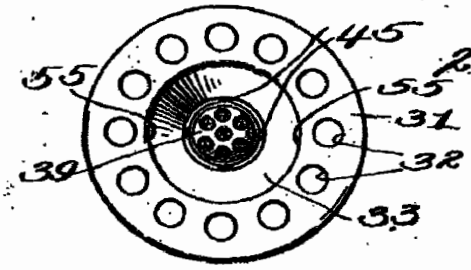
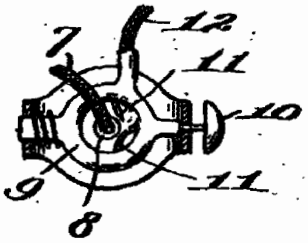


Fig. 5.



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Fig. 2.

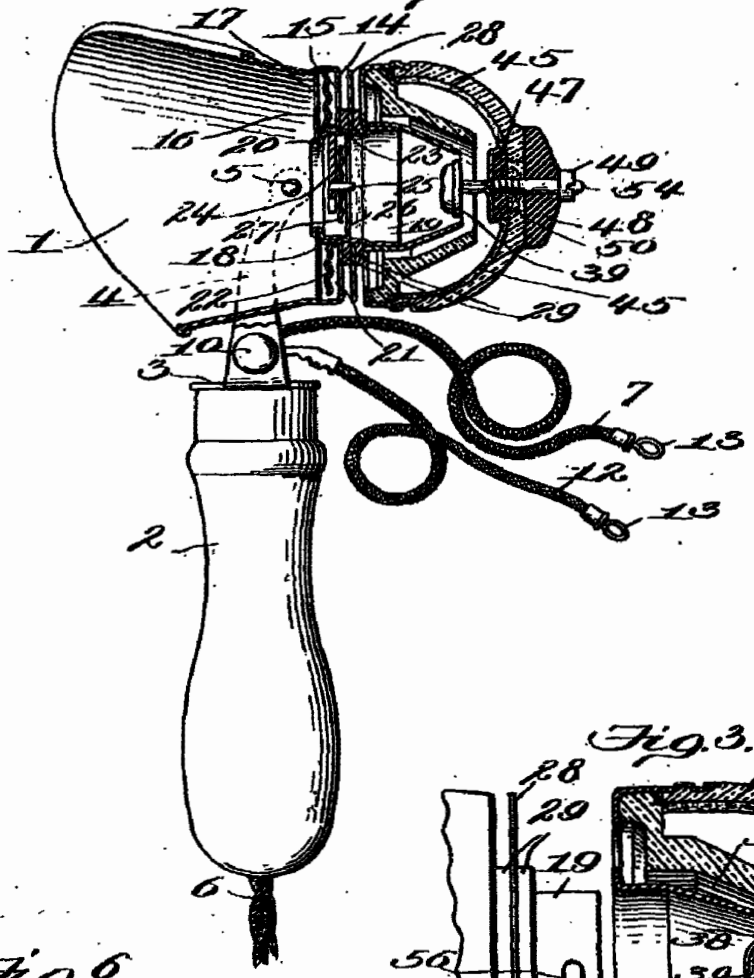


Fig. 3.

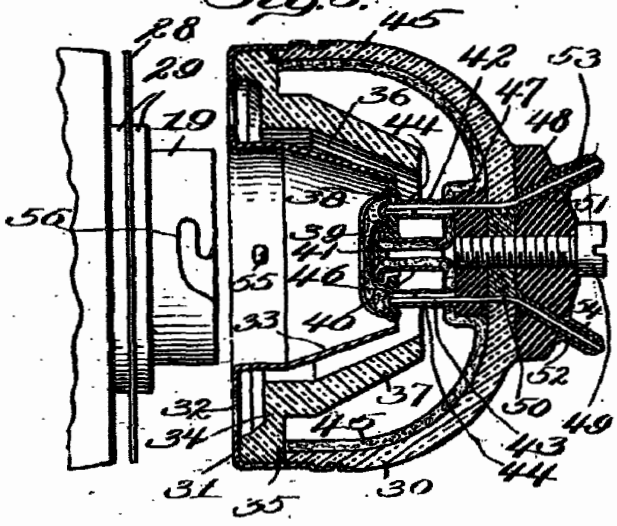
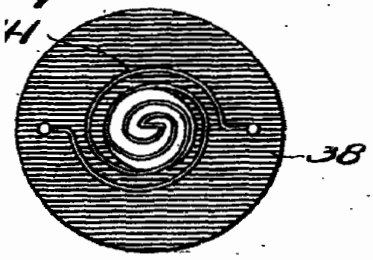


Fig 6



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Malby&Sons, Photo-Litho.

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PATENT SPECIFICATION

588,117

Application Date: Jan. 29, 1945. No. 2293/45.
" " June 15, 1945. No. 15293/45.

One Complete Specification left (under Section 16 of the Patents and Designs Acts, 1907 to 1942): Jan. 29, 1946.

Specification Accepted: May 14, 1947

PROVISIONAL SPECIFICATION
No. 2293 A.D. 1945.

Improvements in or relating to Inhalers for Analgesic or Anaesthetic Purposes

I, JOHN TERRY HAYWARD-BUTT, a British Subject, of Red Gables, Bude, North Cornwall, do hereby declare the nature of this invention to be as follows:—

This invention is for improvements in or relating to inhalers for analgesic or anæsthetic purposes, and has particular reference to inhalers which are small and compact enough to be carried in the pocket and are robust in construction.

Various forms of portable inhalers are already known but these suffer from the disadvantage that the relatively small charge of the volatile inhalant supported on fibrous absorbent material has to be replenished comparatively frequently.

It is an object of the present invention to provide an inhaler for analgesic or anæsthetic purposes which in addition to the properties of lightness, compactness and robustness also possesses the property of having a relatively large capacity so that repeated re-charging at short intervals is unnecessary.

According to the present invention, there is provided an inhaler for analgesic or anæsthetic purposes which comprises a perforated nose-piece, a chamber containing fibrous absorbent material for the volatile liquid analgesic or anæsthetic substance, one or more air inlets for directing air through the absorbent material, a container connected with the said chamber adapted to hold a supply of the volatile liquid and means for feeding the liquid to the absorbent material. As in the case of known inhalers air is drawn by the patient through the absorbent material moistened with the liquid and thence through the perforated nose-piece into the lungs.

The apparatus may be used for the administration of a wide variety of materials but is particularly useful in the administration of the substance known under the Registered Trade Mark "Trilene" and of substances of similar volatility. The apparatus may conveniently be of cylindrical form, the nose-piece, chamber for absorbent and the liquid container may be screw-coupled in series.

The liquid container may be of the unspillable variety so that flooding of the absorbent chamber is prevented and the means for feeding the liquid to the chamber for the absorbent may conveniently consist of a wick, one end of which is embedded in fibrous absorbent (comprising e.g. cotton wool, which may be in the form of dental rolls) and the other end of which dips into the liquid. The absorbent may consist of other fibrous material or of a coil of the wick itself. Alternative means for feeding the liquid may embody a device for passing a predetermined volume of liquid to the absorbent as required.

The end of the liquid container or a cap covering the nose-piece may constitute a measure for the liquid so that over-filling of the container is prevented.

The apparatus is intended to be held in the hand and volatilisation of the liquid is thereby increased. Alternatively, the apparatus may embody a simple form of electric heater.

Means may be provided e.g. a finger-hole or an adjustable valve for controlling the ~~luge~~ flow of air through the apparatus and the air inlet, or inlets, may be so arranged that a screw cap over the nose-piece constitutes an air-tight seal.

It will be understood that the absorbent chamber and liquid container may be arranged concentrically.

The whole apparatus may be sufficiently small to be carried in the pocket e.g. like a pen or like a pencil torch, though it will be understood that parts may vary in relative size, shape and arrangement.

The apparatus may conveniently be made of metal or of synthetic resin or of both and the liquid container may be transparent.

The nose-piece and the rest of the apparatus may if desired be connected by a length of rubber tubing which enables the chambers for the fibrous material and liquid to be fixed e.g. to the patent's head by means of one or more adjustable elastic straps. Alternatively, the complete

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apparatus may be held as above-described and the nose-piece may be connected by rubber tubing to a cap for the patient's nose.

Dated 29th day of January, 1946.
BOULT, WADE & TENNANT,
111 & 112, Hatton Garden, London,
E.C.1,
Chartered Patent Agents.

PROVISIONAL SPECIFICATION
No. 15293 A.D. 1945.

Improvements in or relating to Inhalers for Analgesic or Anaesthetic Purposes

I, JOHN TERRY HAYWARD-BUTT, a British Subject, of Red Gables, Bude, North Cornwall, do hereby declare the nature of this invention to be as follows:—

This invention is for improvements in or relating to inhalers for analgesic or anæsthetic purposes and has particular reference to inhalers which are small and compact enough to be carried in the pocket and are robust in construction and simple in use.

In my Provisional Specification No. 2293/45, I have described an inhaler for analgesic or anæsthetic purposes which comprises a perforated nosepiece, a chamber containing fibrous absorbent material for the volatile liquid analgesic or anæsthetic substance, one or more air inlets for directing air through the absorbent material, a container connected with the said chamber adapted to hold a supply of the volatile liquid and means for feeding the liquid to the absorbent material. In using that apparatus air is drawn by the patient through the absorbent material moistened with the volatile liquid and thence through the perforated nosepiece into the lungs. The liquid container may be of the unspillable variety and the means for feeding the liquid to the chamber for the absorbent may conveniently consist of a wick.

I have now found that the usefulness of the apparatus may be greatly extended by arranging that the charge of volatile liquid is carried in a frangible closed container which can be broken to liberate the volatile liquid when the apparatus is required for use.

According to the present invention apparatus of the general type described in Specification No. 2293/45 is arranged so that its supply of volatile liquid is contained in a frangible ampoule or like container and is provided with means for breaking the ampoule to liberate the liquid.

The ampoule is preferably made of glass or of plastic and the means to liberate the liquid may be such as to break, crush, pierce or otherwise open the ampoule.

The ampoule may conveniently be cylindrical in shape and may fit snugly within the casing of the apparatus. It may be held resiliently in place within the casing by means of fibrous material.

Means for breaking the ampoule may consist of a piston moving within the casing and provided with a striking pin or rod passing through the end cap of the apparatus and pressed away from the ampoule by means of a spring of such stiffness that accidental dropping of the apparatus even on the rod fails to drive the piston against the ampoule.

When the apparatus is required for use the end is driven against a hard surface so as to force the pin and its piston against the end of the ampoule to break it between the piston and the inner end of the nosepiece unit.

Sufficient absorbent fibrous material is provided in the container to soak up the whole of the contents of the ampoule.

Volatilisation of the analgesic or anæsthetic liquid into the air stream is effected by passing air, e.g. from the nosepiece end of the apparatus over a wick wound around the tube attached to the nosepiece and thence through one or more holes or slots into the tube to the nosepiece.

It will be understood that any one of a number of alternative means may be provided for breaking, piercing or opening the ampoule. Thus, the ampoule may be broken by means of a screw plunger or by means of a lever operated from outside the casing, suitable means being provided to guard against accidental breakage of the ampoule.

Dated this 15th day of June, 1945.

BOULT, WADE & TENNANT,
111 & 112, Hatton Garden, London,
E.C.1,
Chartered Patent Agents.

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COMPLETE SPECIFICATION

Improvements in or relating to Inhalers for Analgesic or Anaesthetic Purposes

I, JOHN TERRY HAYWARD-BUTT, a British Subject, of Red Gables, Bude, North Cornwall, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention is for improvements in or relating to inhalers for analgesic or anaesthetic purposes which inhalers are small and compact enough to be carried in the pocket and are robust in construction.

Various forms of portable inhalers are already known but these suffer from the disadvantage that the relatively small charge of the volatile inhalent supported on fibrous absorbent material has to be replenished comparatively frequently.

It is an object of the present invention to provide an inhaler for analgesic or anaesthetic purposes which in addition to the properties of lightness, compactness and robustness also possesses the property of having a relatively large capacity so that repeated re-charging at short intervals is unnecessary. Further it is an object of the invention to provide an inhaler which is simple to charge and use, can be stored in charged condition indefinitely and is rendered ready for use instantly.

According to the present invention, there is provided a pocket inhaler for analgesic or anaesthetic purposes which comprises a perforated nose-piece, a chamber containing fibrous absorbent material for the volatile liquid analgesic or anaesthetic substance, one or more air inlets for directing air through the absorbent material and thence to the nose-piece, a container connected with the said chamber adapted to hold a supply of the volatile liquid and means for feeding the liquid to the absorbent material. The charge of volatile liquid may be carried in a frangible ampoule or like sealed container and the apparatus may be provided with means for breaking the ampoule to liberate the liquid.

As in the case of known inhalers air is drawn by the patient through the absorbent material moistened with the liquid and thence through the perforated nose-piece into the lungs.

The apparatus may be used for the administration of a wide variety of volatile analgesic or anaesthetic materials but is particularly useful in the administration of trichlorethylene, a substance known under the Registered Trade Mark "Trilene" and of substances of similar volatility. The apparatus may conveniently be of cylindrical form, and the nose-piece, chamber for absorbent and the liquid container or the container for the ampoule may be screw-coupled in series.

The liquid container may be of the unspillable variety so that flooding of the absorbent chamber is prevented and the means for feeding the liquid to the chamber for the absorbent may conveniently consist of a wick, one end of which is embedded in fibrous absorbent (comprising e.g. cotton wool, which may be in the form of dental rolls) and the other end of which dips into the liquid. The absorbent may consist of other fibrous material or of a coil of the wick itself. Alternative means for feeding the liquid may embody a device for passing a predetermined volume of liquid to the absorbent as required.

The end of the liquid container of a cap covering the nose-piece may constitute a measure for the liquid so that over-filling of the container is prevented.

The apparatus is intended to be held in the hand and volatilisation of the liquid is thereby increased. Alternatively, the apparatus may embody a simple form of electric heater.

Means may be provided, e.g. a finger-hole or an adjustable valve, for controlling the flow of air through the apparatus and the air inlet, or inlets, may be so arranged that a screw cap over the nose-piece constitutes an air-tight seal.

It will be understood that the absorbent chamber and liquid container may be arranged concentrically.

The whole apparatus is sufficiently small to be carried in the pocket, e.g. like a pen or like a pencil torch, though it will be understood that the parts may vary in relative size, shape and arrangement.

The apparatus may conveniently be made of metal or of synthetic resin or of both and the liquid container may be transparent.

The nose-piece and the rest of the apparatus may if desired be connected by a length of rubber tubing which enables the chambers for the fibrous material and liquid to be fixed, e.g. to the patient's head, by means of one or more adjustable elastic straps. Alternatively, the complete apparatus may be held as above.

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described and the nose-piece may be connected by rubber tubing to a cap for the patient's nose.

When the liquid charge is contained in an ampoule this is preferably made of glass or of plastic and the means to liberate the liquid may be such as to break, crush, pierce or otherwise open the ampoule.

The ampoule may conveniently be cylindrical in shape and may fit snugly within the casing of the apparatus. It may be held resiliently in place within the casing by means of fibrous material.

Means for breaking the ampoule may consist of a piston moving within the casing and provided with a striking pin or rod passing through the end cap of the apparatus and pressed away from the ampoule by means of a spring of such stiffness that accidental dropping of the apparatus even on the rod fails to drive the piston against the ampoule.

When the apparatus is required for use the end is driven against a hard surface so as to force the pin and its piston against the end of the ampoule to break it between the piston and the inner end of the nose-piece unit.

Sufficient absorbent fibrous material is provided in the container to soak up the whole of the contents of the ampoule.

Volatilisation of the analgesic or anæsthetic liquid into the air stream is effected by passing air, e.g. from the nose-piece end of the apparatus over a wick wound around the tube attached to the nose-piece and thence through one or more holes or slots into the tube to the nose-piece.

It will be understood that any one of a number of alternative means may be provided for breaking, piercing or opening the ampoule. Thus, the ampoule may be broken by means of a screw plunger or by means of a lever operated from outside the casing, suitable means being provided to guard against accidental breakage of the ampoule.

Following is a description by way of example and with reference to the accompanying diagrammatic drawing of three forms of inhaler made in accordance with the present invention.

In the drawing,

Figure 1 shows partly in central section an inhaler provided with a supply of volatile analgesic or anæsthetic liquid in a sealed ampoule.

Figure 2 shows an alternative form of inhaler, also in section in which the liquid is contained in a sealed frangible container broken by means of a screw-threaded plunger; and

Figure 3 shows in section another form of apparatus in which the liquid is contained in a non-spillable chamber within the casing.

Similar reference numerals denote similar parts throughout the figures of the drawing.

Referring to the three figures, 11 is a casing which is preferably metal and has a screwthreaded vapour-tight nose-cap 12 at one end. A nose-piece 13 provided with nostril-guard 14 projects from the casing 11 and terminates within the casing in a tubular extension 15 which is slotted or otherwise perforated at 16 and at its inner end preferably terminates in a solid head 17. The tubular extension 15 is held in position axially in the casing 11 by means of locating plates 18 and 19, the latter being provided with one or more holes for the admission of air to the annular space between the casing 11 and the tubular extension 15. The tubular extension 15 is wound with a wick of fibrous liquid absorbent material 20. Referring to Figure 1, the volatile liquid 21 is held in a sealed frangible ampoule 22 and is held in position in the casing between plugs of fibrous material 23 and 24. That end of the casing remote from the nose-piece is closed by means of a screw cap 25 provided with a central hole 26 through which a pin 27 of a piston 28 passes. This piston is held away from the ampoule 22 by means of a spring 29 which bears against the abutment 30 and is of such stiffness that even if the apparatus falls to the ground on the pin 27 the ampoule is not broken.

The inhaler is operated by holding it in the hand and driving the pin 27 against a hard surface to break the ampoule 22 and liberate the liquid 21 which saturates the fibrous material 23 and 24 and the wick 20. The cap 12 is now withdrawn and the nose-piece 13 inserted in the nostril. Air is aspirated through the perforated plate 19 over the wick 20 through the slot 16 and thence to the nose-piece. Vaporisation of the volatile liquid is assisted by the warmth of the hand.

Referring to Figure 2, a frangible ampoule 33 is held loosely in position by inwardly-extending projections 34 and by a screwthreaded plunger 35. The end face of the plunger 35 remote from the ampoule is grooved, as at 36, for rotation of the plunger, e.g. by means of a coin or by means of a flange 37 attached to the end of the screw cap 38 for the purpose of breaking the ampoule and liberating the liquid.

Referring to Figure 3, the casing 11 is divided by a transverse wall 31 provided with an axially-projecting tube 32 and wick 20. The chamber 39 is charged with

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volatile liquid through the screwed-on cap 40, the amount of liquid being such that liquid does not flow directly through the tube 32. In this case, the apparatus is instantly ready for use as long as any liquid remains in it and requires only the removal of the nose-cap and insertion in the nostril.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A pocket inhaler for analgesic or anæsthetic purposes which comprises a perforated nose-piece, a chamber containing fibrous material for absorbing volatile liquid analgesic or anæsthetic substance, one or more air inlets for directing air through the absorbent material and thence to the nose piece, a container for a supply of the volatile liquid and means for feeding the liquid to the absorbent material.

2. A pocket inhaler as claimed in Claim 1, wherein the volatile liquid is stored in a sealed frangible container within the chamber and wherein means are provided for breaking the frangible container to liberate the liquid.

3. A pocket inhaler as claimed in Claim 1 or Claim 2, wherein the nose-piece is provided with a perforated tubular extension which is associated with fibrous material absorbent for volatile liquid analgesic or anæsthetic substance, the absorbent material terminating in a closed chamber containing a charge of the said volatile liquid and arranged to feed the liquid by capillary attraction to the tubular extension.

4. A pocket inhaler as claimed in any one of the preceding claims wherein the fibrous absorbent material takes the form of a wick.

5. A pocket inhaler as claimed in Claim 1 which comprises a substantially cylindrical casing, a container for volatile liquid analgesic or anæsthetic substance within said casing and towards one end thereof, a tube passing through the end wall of the container remote from the end of the casing to constitute a non-spill device for the liquid, a nose-piece projecting from the casing and terminating within the casing in a perforated tubular extension and a wick of fibrous material associated with the tubular extension of the nose-piece and passing through the tube into the volatile liquid.

6. A pocket inhaler as claimed in any one of Claims 1 to 4 which comprises a substantially cylindrical casing, a nose-piece projecting from one end of said casing and terminating within the casing in a perforated tubular extension, fibrous absorbent material for a volatile liquid analgesic or anæsthetic substance associated with the said tubular extension, a frangible ampoule containing a charge of the said liquid within the casing adjacent to the fibrous material and means for breaking the ampoule to liberate the liquid.

7. An inhaler as claimed in Claim 6 wherein the means for breaking the ampoule comprises a screw-threaded plunger operable from outside the casing to crush the ampoule.

8. An inhaler as claimed in Claim 6 wherein the means for breaking the ampoule comprises a piston which is spring-loaded to urge it away from the ampoule and is provided with a striking pin passing through the end of the cylindrical casing remote from the nose-piece.

9. An inhaler as claimed in any one of the preceding claims wherein a screw cap is provided to cover the nose-piece and to render the apparatus vapour-tight.

10. An inhaler as claimed in any one of the preceding claims wherein the volatile analgesic liquid is trichlorethylene.

11. A pocket inhaler substantially as described with reference to the accompanying drawings.

Dated this 29th day of January, 1946.

BOULT, WADE & TENNANT,
111 & 112, Hatton Garden, London,
E.C.1,
Chartered Patent Agents.

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588,117 COMPLETE SPECIFICATION 1 SHEET

[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 1.

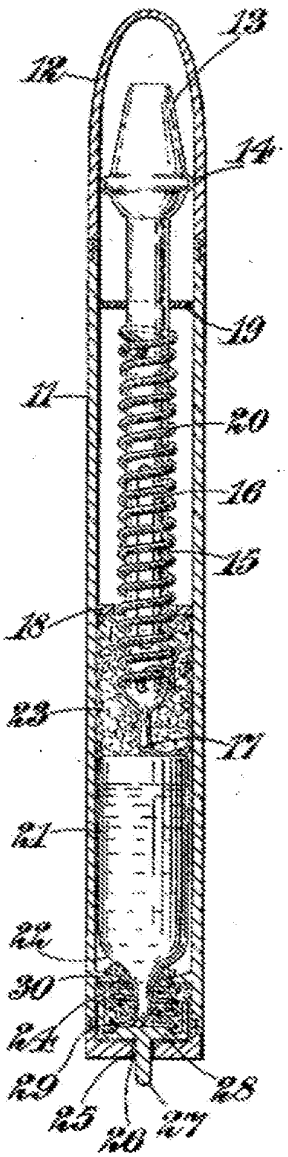


Fig. 2.

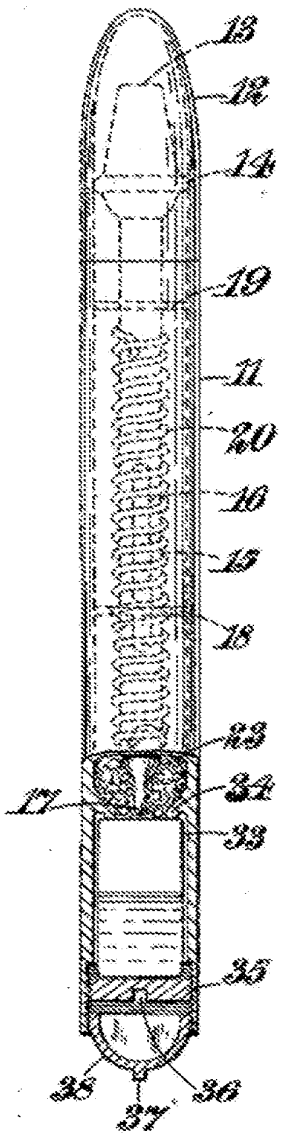
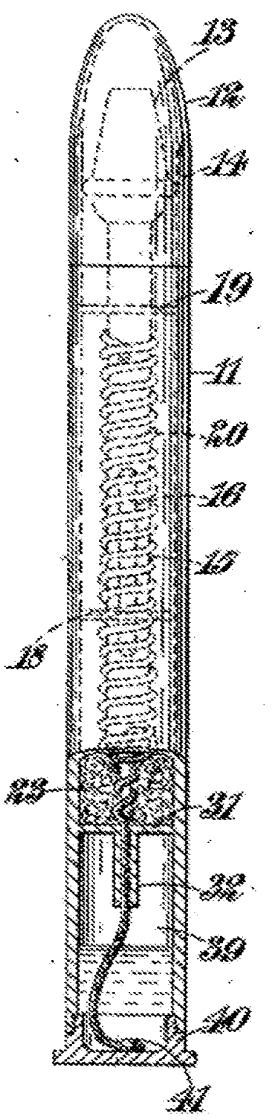


Fig. 3.



H.M.S.O. (1p. 8)

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Espacenet

Bibliographic data: DE2704218 (A1) — 1978-08-03

Smoking simulator with heater and aromatic substances - has combustible gas source and electrically ignited heater in suction channel

Inventor(s): KOVACS LORANT [DE] ± (Kovacs, Lorant, Dr)

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Classification: - **international:** ***A24F47/00; A61M16/10;*** (IPC1-7): A24F47/00
- **cooperative:** A24F47/008; A61M16/1075

Application number: DE19772704218 19770202

Priority number(s): DE19772704218 19770202 ; DE19762653133 19761123

Abstract of DE2704218 (A1)

The smoking simulator has a tube with a mouthpiece. The latter is connected by a suction channel to a chamber producing aroma. This chamber is enclosed by a gas container. The simulator ensures enjoyment associated with smoking without the damaging effect of tobacco smoke. The heater is arranged into the gas container or suction channel, projects outwards, and is heated by a flame. Electrical ignition system with battery or piezoelectric arrangement can be used. The gas container of aromatic materials can be divided into several chambers and one of these chambers contains combustible gas.

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DESCRIPTION DE2704218

"Device for simulating smoking"

The invention relates to a device for simulating smoking with a, provided with a customer tubular body having a connected to an opening in the mouthpiece suction channel and a gas container comprising a fragrance chamber, esp.

according to patent (Patent Application P26 53 133.9).

By meadow training a device for simulating smoking according to the main patent is a very created for the whirling device that provides all occurring during smoking Keize and Kewegungen, but without the associated with the real tobacco smoking severe health scars.

The invention is based on the object even further verbcsrrern this device, so that even without increased Gesundteitsschäd- sensitivity an even stronger simulation of the actual tobacco smoking is possible.

To solve this problem, a device of the type mentioned according to the invention is characterized by a serving for heating the sucked gas mixture heater.

For this purpose, the already mentioned in the main patent battery can be used in-the latter in the simplest case feeds a heating coil, which is flowed around by the aspirated gas mixture, so that it

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heats up. Of course, in order to avoid excessive power consumption, a switch can be provided which must either be operated manually, and turn on the heating device. Advantageously, but you will form the switch so that it directly by the at. Suction generated negative pressure during its duration is actuated.

In a further development of the invention, the heating device can also be arranged by a gas container or in the suction channel, partially extending outwards and there by means of a flame or dvl. In this way, even the typisciie and in the fight against smoking often underestimated in their importance forced movement of Zigaretstenanzündens meaningfully included in the health-harmless simulated smoking. The senuser holds a lighter or match to the outwardly gnawing portion of the highly thermally conductive heating element, which can be arranged to simulate particularly true to the @ ände of the device, where otherwise actually ignited his cigarette By only a few seconds amount of heat can be doing Saving enough heat in the heating element, so that several "trains" are possible in which the aspirated gas mixture is warmed as in the actual cigar smoke.

With particular advantage, in a further refinement / a vessel containing fluid combustible substance and an electrical ignition device can be provided in the outlet area of this vessel in the .au-channel. By burning a controlled amount of this fluid combustible substance - preferably it is a gaseous substance at room temperature - there is an entsprenchende brwärmung the sucked gas.

The placement of the combustible gas carried on in such a way that the gas container for the perfume or its carrier gas is divided into a plurality of chambers, one of these chambers containing the inventive combustible gas. However, the training is also possible in such a way that the carrier gas in the gas tank consists wholly or partly of a combustible gas.

For @ntz dun of the @@@ ses can be provided either a battery - @@ fed Kangeinrichtung or a Piezo-Zündeinrichtung. The latter has the advantage that can be omitted in battery ignition necessary periodic replacement of a battery. On the other hand, piezoelectric igniters but in general a hand-operated switch for the mechanical generation of a puncture by Druckbeaufschla movement of a piezocrystal required. The formation of a manually operable switch can be particularly advantageous in such a way that it can be actuated by Lewegen two mutually movable device parts, for example by twisting or pivoting of the gas container relative to the device mouthpiece. Of course, but also a separate pressure switch or dl. Lich.

Finally, it is also within the scope of the invention to design the ignition switch in such a way that it

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is actuated by the outlet valve of the gas container, d. H. especially in the quiet that the valve that is created by the leg suction first opens the valve and closes the switch at the opening of the valve, so that a spark causes the combustible components of the outflowing gas to react.

In order to ensure a sufficient supply of oxygen for the combustion of the hot gases, air suction in the mouthpiece can be seen.

As a heating gas, for example, propane, which this is both a four-number of fragrances such. As camphor, menthol or H20 can solve, on the other hand also very clean and virtually pre-burns without the appearance of harmful CO gases to CO2 and water. The gas container containing the combustible welding gas can either be designed such that it can be refilled from a larger storage bottle, in the manner of gas fire. But it can also be provided that the cartridges are replaced after each use against new cartridges.

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(54) Bezeichnung: Gerät zum Simulieren des Rauchens

(61) Zusatz zu: P 26 53 133.9

(71) Anmelder: Kovacs, Lorant, Dr., 8802 Sachsen

(72) Erfinder: gleich Anmelder

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PATENTANSPRÜCHE

1. Gerät zum Simulieren des Rauchens mit einem mit einem Mundstück versehenen rohrförmigen Körper, der einen mit einer Öffnung im Mundstück verbundenen Saugkanal und eine einen Gasbehälter umfassende Duftkammer insb. nach Patent (Patentanmeldung P 26 53 133.9) aufweist, gekennzeichnet durch eine zum Erwärmen des angesaugten Gasgemisches dienende Heizeinrichtung.

2. Gerät nach Anspruch 1, gekennzeichnet durch ein im Gasbehälter oder im Saugkanal angeordnetes, sich teilweise nach außen erstreckendes und dort mittels einer Flamme o. dgl. zu erwärmendes Heizelement, aus einem Material mit guter Wärmeleitfähigkeit.

3. Gerät nach Anspruch 1, gekennzeichnet durch einen eine fluide brennbare Substanz enthaltenden Behälter sowie eine elektrische Zündeinrichtung in dessen Austrittsbereich in den Saugkanal.

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4. Gerät nach Anspruch 3, dadurch gekennzeichnet, daß der Gasbehälter für den Duftstoff bzw. dessen Trägergas in mehrere Kammern unterteilt ist, und daß eine dieser Kammern die brennbare Substanz enthält.

5. Gerät nach Anspruch 3, dadurch gekennzeichnet, daß das Trägergas im Gasbehälter ganz oder teilweise aus einem brennbaren Gas besteht.

6. Gerät nach einem der Ansprüche 3 bis 5, gekennzeichnet durch eine Batterie- gespeiste Zündeinrichtung.

7. Gerät nach einem der Ansprüche 3 bis 5, gekennzeichnet durch eine Piezo-Zündeinrichtung.

8. Gerät nach Anspruch 6 oder 7, gekennzeichnet durch einen von Hand zu betätigenden Zündschalter.

9. Gerät nach Anspruch 8, dadurch gekennzeichnet, daß der Schalter so ausgebildet ist, daß er durch Bewegen zweier gegeneinander beweglichen Geräteteilen betätigbar ist

10. Gerät nach Anspruch 6 oder 7, dadurch gekennzeichnet, daß der Zündschalter durch das Austrittsventil des Gasbehälters betätigt wird.

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" Gerät zum Simulieren des Rauchens "

(Zusatzanmeldung zur Patentanmeldung P 26 53 133.9)

Die Erfindung betrifft ein Gerät zum Simulieren des Rauchens mit einem, mit einem Mundstück versehenen rohrförmigen Körper, der einen mit einer Öffnung im Mundstück verbundenen Saugkanal und eine einen Gasbehälter umfassende Duftkammer aufweist, insb. nach Patent (Patentanmeldung P 26 53 133.9).

Durch diese Ausbildung eines Geräts zum Simulieren des Rauchens gemäß dem Hauptpatent ist eine sehr wirksame Vorrichtung geschaffen, die alle beim Rauchen vorkommenden Reize und Bewegungen bietet, ohne jedoch die mit dem wirklichen Tabakrauchen verbundenen schweren gesundheitlichen Schäden.

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Der Erfindung liegt die Aufgabe zugrunde, dieses Gerät noch weiter zu verbessern, so daß ohne erhöhte Gesundheitsschädlichkeit eine noch stärkere Simulierung des tatsächlichen Tabakrauchens möglich ist.

Zur Lösung dieser Aufgabe ist ein Gerät der eingangs genannten Art gemäß der Erfindung gekennzeichnet durch eine zum Erwärmen des angesaugten Gasgemisches dienende Heizeinrichtung.

Zu diesem Zweck kann die bereits im Hauptpatent genannte Batterie verwendet werden, indem diese im einfachsten Fall eine Heizspirale speist, welche von dem angesaugten Gasgemisch umströmt wird, so daß sich dieses dabei erwärmt. Um einen übermäßigen Stromverbrauch zu vermeiden, kann dabei selbstverständlich ein Schalter vorgesehen sein, der entweder von Hand betätigt werden muß, um die Heizvorrichtung einzuschalten. Vorteilhafterweise wird man aber den Schalter so ausbilden, daß er unmittelbar durch den beim Ansaugen erzeugten Unterdruck während dessen Dauer betätigt wird.

In Weiterbildung der Erfindung kann die Heizeinrichtung auch durch ein im Gasbehälter oder im Saugkanal angeordnetes, sich teilweise nach außen erstreckendes und dort mittels einer Flamme oder dgl. erwärmendes Heizelement gebildet sein. Auf diese Weise läßt sich sogar die typische und bei der Bekämpfung des Rauchens häufig in ihrer Bedeutung unterschätzte Zwangsbewegung des Zigarettenanzündens sinnvoll in das gesundheitsunschädliche

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simulierte Rauchen einbeziehen. Der Benutzer hält ein Feuerzeug oder Streichholz an den nach außen ragenden Abschnitt des gut wärmeleitenden Heizelements, das zur besonders wirklichkeitsgetreuen Simulierung am Ende des Geräts angeordnet sein kann, wo man sonst auch tatsächlich seine Zigarette anzündet. Durch ein nur wenige Sekunden betragendes Aufheizen läßt sich dabei genügend Wärme im Heizelement speichern, so daß mehrere "Züge" möglich sind, bei denen das angesaugte Gasgemisch wie beim tatsächlichen Zigarettenrauch angewärmt ist.

Mit besonderen Vorteil kann in weiterer Ausgestaltung ein/eine fluide brennbare Substanz enthaltender Behälter sowie eine elektrische Zündeinrichtung im Austrittsbereich dieses Behälters in den Saugkanal vorgesehen sein. Durch Verbrennen einer kontrollierten Menge dieser fluiden brennbaren Substanz - vorzugsweise handelt es sich um eine bei Raumtemperatur gasförmige Substanz - erfolgt eine entsprechende Erwärmung des angesaugten Gases.

Die Unterbringung des brennbaren Gases kann in der Weise erfolgen, daß der Gasbehälter für den Duftstoff bzw. dessen Trägergas in mehrere Kammern unterteilt ist, wobei eine dieser Kammern das erfindungsgemäße brennbare Gas mit enthält. Die Ausbildung ist aber auch in der Weise möglich, daß das Trägergas im Gasbehälter ganz oder teilweise aus einem brennbaren Gas besteht.

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Zur Entzündung des Gases kann entweder eine batteriegespeiste Zündeinrichtung oder eine Piezo-Zündeinrichtung vorgesehen sein. Die letztere hat dabei den Vorteil, daß das bei Batteriezündeinrichtungen notwendige periodische Auswechseln einer Batterie entfallen kann. Auf der anderen Seite bedarf es bei Piezo-Zündeinrichtungen aber im allgemeinen eines handbetätigten Schalters zur mechanischen Erzeugung eines Funkens durch Druckbeaufschlagung eines Piezokristalls. Die Ausbildung eines handbetätigbaren Schalters kann besonders vorteilhaft in der Weise erfolgen, daß er durch Bewegen zweier gegeneinander beweglicher Geräteteile betätigbar ist, beispielsweise durch Verdrehen oder Verschwenken des Gasbehälters gegenüber dem Gerätemundstück. Selbstverständlich ist aber auch ein gesonderter Druckschalter oder dgl. möglich.

Schließlich liegt es auch noch im Rahmen der Erfindung, den Zündschalter in der Weise auszubilden, daß er durch das Austrittsventil des Gasbehälters betätigt wird, d. h. insbesondere in der Weise, daß durch den beim Saugen entstehenden Unterdruck zunächst das Ventil öffnet und mit der Öffnung des Ventils der Schalter schließt, so daß ein Zündfunken die brennbaren Bestandteile des ausströmenden Gases zur Reaktion bringt.

Um eine ausreichende Sauerstoffzufuhr für das Verbrennen der Heizgase sicherzustellen, können im Mundstück Luftansaugöffnungen vorgesehen sein.

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Als Heizgas eignet sich beispielsweise Propan, da dieses sowohl eine Vielzahl von Duftstoffen, wie z. B. Kampfer, Menthol oder H_2O lösen kann, zum anderen aber auch sehr sauber und praktisch ohne das Auftreten schädlicher CO-Gase zu CO_2 und Wasser verbrennt. Der das brennbare Heizgas enthaltende Gasbehälter kann entweder so ausgebildet sein, daß er aus einer größeren Vorratsflasche - nach Art von Gasfeuerzeugen - nachfüllbar ist. Es kann aber auch vorgesehen sein, daß die Patronen jeweils nach Gebrauch gegen neue Patronen ausgetauscht werden.

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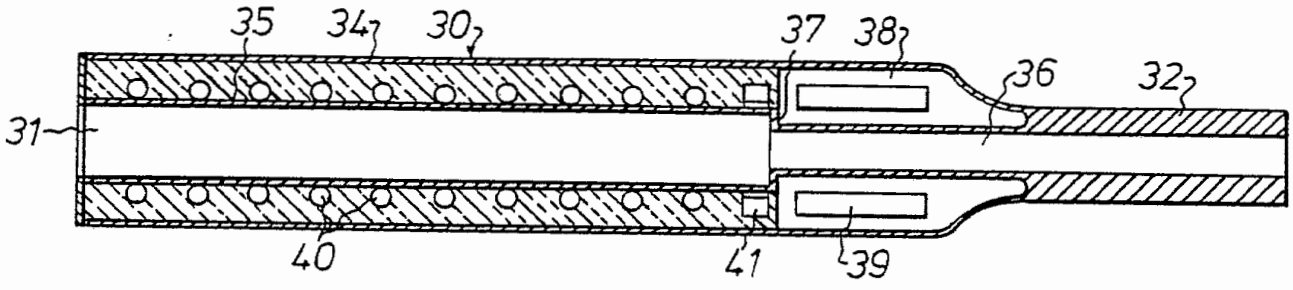
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(54) Title: TOBACCO COMPOSITIONS, METHOD AND DEVICE FOR RELEASING ESSENTIALLY PURE NICOTINE



(57) Abstract

Novel tobacco compositions which - when subjected to an elevated temperature below the combustion temperature of the tobacco - liberates essentially pure nicotine. The invention also includes a method for liberating nicotine from the compositions and a device for carrying out the method.

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FR	France	**ML**	Mali		

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TOBACCO COMPOSITIONS, METHOD AND DEVICE FOR RELEASING ESSENTIALLY PURE NICOTINE

The present invention concerns tobacco compositions and a non-combustion method of liberating essentially pure nicotine from such compositions. It also includes a device for carrying out the method.

It is now widely recognized that smoking can be a major health hazard. This hazard can be cut down by reducing or eliminating smoking, but smokers find this extremely difficult and it is generally accepted that this difficulty is caused by nicotine-dependence. While the presence of nicotine in tobacco smoke is considered a risk factor, there are other, more important risk factors in the substances formed during the combustion of tobacco such as carbon monooxide, tar products, aldehydes and hydrocyanic acid.

One way of eliminating risk factors other than nicotine is disclosed in the US patent 4,284,089. According to this patent pure nicotine vapors are obtained when air is drawn through a device containing a nicotine mixture disposed within an absorbent member. The nicotine mixture may be selected from the group consisting of nicotine (d), nicotine (l), nicotine (d,l), nicotine salts and nicotine esters.

The US patents 4,141,369 and 4,219,032 disclose devices for non-combustion utilization of tobacco. These devices are concerned with designs of the devices different from that according to the present invention. Besides, no information is given on the amount or the purity of nicotine obtained when gas from these devices is inhaled.

Objects of the invention

It is an object of the invention to provide a novel tobacco composition which - when air is drawn therethrough for inhalation purposes - liberates essentially pure nicotine.

A second object of the invention is to provide a non-combustion method of liberating essentially pure nicotine for inhalation purposes from the novel tobacco composition.

A third object of the invention is to provide a non-combustion method of liberating essentially pure nicotine from the novel tobacco compositions according to which essentially the same rate and amount of nicotine release is obtained at inhalation as when smoking the corresponding amount of tobacco.

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A forth object is to provide a non-combustion method of liberating essentially pure nicotine from the novel tobacco compositions, which method requires only moderately elevated temperatures at which essentially no thermal decomposition products are formed.

A fifth object of the invention is to provide a device that can be used for the inhalation of nicotine from the novel tobacco composition.

A sixth object of the invention is to provide a nicotine releasing product that can be handled in substantially the same way as the tobacco products presently used, which is not clumsy or complicated and which comprises the device having the novel tobacco compositions included therein.

Summary of the invention

The invention concerns novel tobacco compositions liberating essentially pure nicotine when air is drawn through the composition for e.g. inhalation purposes. The compositions include as major constituents tobacco, water and a basic substance. Optionally oils, detergents and/or flavoring agents may be added to the compositions.

The invention also concerns a non-combustion method of liberating essentially pure nicotine from these tobacco compositions, comprising the steps of mixing a tobacco material optionally containing oils, detergents and/or flavoring agents with water and a basic substance optionally dissolved or dispersed in the water. The composition obtained is heated to a temperature below the combustion temperature of the tobacco but sufficiently high to liberate nicotine in an amount and at a rate similar to that obtained at smoking when air is drawn through the composition.

The device for the release and administration of nicotine according to the invention comprises receiving means (10, 30) which has a space (11, 31) provided with an inlet and an outlet (12, 36) and in which a matrix such as the novel tobacco compositions containing the nicotine is insertable, and a mouthpiece (19, 32) communicating with the outlet (12, 36) of said receiving space. The device is characterized by a heating element (14; 40; 46, 47; 49, 50) associated with said receiving space (11, 31), said element being adapted upon manual activation to produce heat in said space (11, 31), and means (17; 41) for restricting the temperature in the receiving space (11, 31) to a predetermined value below the combustion temperature of the matrix.

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Detailed description of the invention

The tobacco compositions according to the invention includes a mixture consisting essentially of tobacco, water and a basic substance. The water might be added to the tobacco in the form of ordinary drinking water. Before mixing the tobacco and water it might be preferable to dissolve or disperse the basic substance in the water. The tobacco compositions according to the invention might also contain the water in the form of water-containing salt or in the form of heatsensitive microcapsuls. Examples of watercontaining salts are soda or zeolites. Other representative examples are calcium hydrates such as calcium monohydrate, dihydrate or hexahydrate, sodium pyrophosphates such as $Na_4P_2O_7 10\ H_2O$ or $Na_4P_2O_7\ 6\ H_2O$, or sodium ortophosphates such as $Na_2HPO_4\ 7\ H_2O$ or $Na_2HPO_4\ 12\ H_2O$. The "dry" water contained in the watercontaining salts and in the microcapsuls is set free at the elevated temperature required according to the invention and a wet basic tobacco composition is obtained. This composition is capable of releasing nicotine at inhalation in an amount and at a rate similar to that which is obtained when smoking.

Special advantages can be obtained by using $Na_2CO_3\ 10\ H_2O$. This salt contains water to such an amount that it will not be necessary to add free water at the same time as a basic substance necessary to get the required pH is provided. In order to obtain an effective amount of nicotine, i.e. an amount of the same magnitude as when smoking, it is required that the pH of the tobacco compositions according to the present invention exceeds 7. Preferably the pH shall exceed 8 and most preferably 8.8. There seems to be no need to use a pH above 12 and with ordinary tobacco there seems to be no need to use compositions having a pH above 10. However, the upper limit of the pH can be decided separately and according to taste, desired nicotine release and other parameters known to the man skilled in the art.

As pointed out previously a certain amount of water is necessary in order to get a satisfactory nicotine release. It should be pointed out in this context that tobacco contains water in amounts varying between 5 and 25 percent (weight/weight) of the tobacco. For the same reasons as discussed above as regards the pH it is obvious that the water content of the tobacco composition according to the invention can vary within a wide range. Good results as regards the nicotine release have been obtained with tobacco compositions having a water content varying between 0.25 and 7, preferably between 1 and 5, g water per g ordinary tobacco. At present the most favourable results have been obtained with about 3 g water/g ordinary tobacco.

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In addition to soda the basic material might be selected from a wide variety of substances which, of course, shall be non-toxic and preferably tasteless or palatable. Examples of suitable basic substances to be incorporated in the tobacco compositions according to the invention are carbonates or hydroxides of sodium, potassium or calcium.

Various additives can be incorporated into the tobacco compositions according to the invention in order to improve its characteristics. Examples of such additives are oils, e.g. silicone oils and paraffine oils, detergents, e.g. polyoxyethylene ethers such as Brij™ or Tween™ and flavoring agents, e.g. menthol, anis.

The present invention also concerns a method for liberating essentially pure nicotine from tobacco for inhalation purposes. This method comprises the steps of mixing a tobacco material optionally containing oil, detergent and/or flavoring agents with water and a basic substance optionally dissolved or dispersed in the water and heating the composition obtained to a temperature sufficient to liberate an efficient amount of nicotine but below the combustion temperature of the tobacco. As previously described the water may be in the form of a watercontaining salt or in the form of heatsensitive microcapsuls and optionally the water and the basic substance may be provided in the same substance, e.g. soda.

As described above the efficient amount of nicotine is an amount corresponding to the amount that the smoker obtains when smoking. The temperature required in order to obtain this amount on the composition used can be easily determined by simple experiments. Usually the temperature required varies between 30 and 200°C and preferably between 50 and 100°C. The most favourable results have been obtained by using temperatures between 70 and 80°C. In order to reach the desired temperature rapidly it might be suitable to subject the tobacco compositions to a higher temperature initially. When the water is present in bound form in the tobacco composition free water will be liberated upon heating.

The following tests illustrate the release of nicotine from the compositions according to the invention:

Small glass columns were packed with tobacco compositions according to the invention. The tobacco compositions consisted of 1 g of tobacco

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that had been soaked with 2 ml of a saturated aqueous sodium carbonate solution. Untreated tobacco was used as reference. Air (1 liter) was blown through each column at a rate of 50 ml/3-4 s with a syringe and the released nicotine was collected in sulphuric acid solution. UV absorption measurements indicated that essentially pure nicotine was liberated.

The following results were obtained:

Tobacco composition	Temperature °C	Released nicotine mg/l air
According to the invention	35	0.05 - 0.10
"	55	approx.0.50
"	75	" 2.20
Untreated	75	" 0.03

The bioavailability of nicotine, i.e. the blood plasma nicotine levels, after inhalation of air from the glass columns prepared as described above at 65°C and 75°C, respectively was also investigated. The test persons had abstained from smoking or having nicotine in any other way for 12 h before the test.

The following plasma peak values were obtained:

Temperature °C	Plasma nicotine ng/ml
65	5
75	10-15

A device for the release and administration of nicotine from the composition described above should comply with two important requirements. First, it must be able to produce heat of a temperature which is below the combustion temperature of the matrix, i.e. tobacco composition, and, secondly, it must be small and easy to transport and handle. Preferably, it should have the approximate size and shape of a cigarette holder or a pipe, i.e. have the appearance of an object to which the smoker is accustomed.

In the enclosed drawings, there are shown examples of suitable devices. Fig. 1 is a perspective view of a device designed as a "cigarette" holder, together with a "cigarette", by which is meant a composition of the present invention as herein defined, in the form of a more or less

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conventional cigarette, with or without an external wrapper of paper, plastic or the like. Figs. 2, 3 and 4 are sectional views of different designs of the device according to Fig. 1. Fig. 5 is a sectional view of a device resembling a pipebowl.

In Fig. 1, the device according to the invention is in the form of cigarette holder 30 defining a cylindrical space 31 which is open at one end of the holder 30 and so dimensioned that an untipped cigarette 33 is insertable therein substantially in its entirety with suitable friction. At the opposite end, the holder 30 is designed with a mouthpiece 32. It appears that the cigarette holderlike device does not differ to any major extent from a conventional cigarette holder.

The device 30 may take the form of many different embodiments to fulfil the objects of the invention. According to Fig. 2, the peripheral wall of the opening 31 and an outer wall 34 define between them a space of annular cross-section having a length corresponding to that of the "cigarette" 33. At its end remote from the insertion end, the opening 31 merges into an opening 36 of reduced cross-section via an abutment 37 restricting the depth of insertion of the "cigarette" 33. The annular channel defined between the walls 34, 35 is slightly widened in the area between the abutment 37 and the mouthpiece 32 to provide room in this widened space 38 for an electric battery 39. This battery 39 is connected over a switch (not shown) to a heating coil 40 surrounding the wall 35 defining the opening 31. In the lines (not shown) between the battery 39 and the coil 40, there is connected a circuit comprising a temperature sensor 41, preferably also comprising predetermined temperature maximizing and minimizing means (not shown). In the use of the holder according to Fig. 2, a "cigarette" 33 is introduced in the opening 31 and the switch (not shown) is activated so that current is supplied to the coil 40 which then supplies heat to the "cigarette" 33 in the space 31. When the predetermined maximum temperature has been reached, this is detected by the sensor 41 which disconnects the battery 39 and reconnects it again when the lower temperature minimum is reached. The temperature in the space 31 can be maintained by means of the illustrated device within a desired narrow temperature range. The Figure merely illustrates the main parts of the device schematically whereas such components as switches, leads, etc., are not illustrated inasmuch as the device can be modified in many different ways within the scope of the invention and the details may vary from one embodiment to another and because such means as are not illustrated are conventional in the art.

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Fig. 3 illustrates another embodiment of the invention, in which the electric heating device has been replaced by a gas burner device. Thus, the walls 34 and 35 define between them a chamber 42 which can be filled with gas through a conventional charging valve 45, e.g., of the type used in cigarette-lighters. Between the walls, there is arranged a further chamber 43 accomodating an igniting device 47 which may also be of the same type as employed conventionally in cigarette-lighters. The two chambers are separated by a partition 44 in which a flow control valve 46 for controlling the flow of gas into the chamber 43 (and then into material 48) is disposed. The remainder of the space between the walls 34 and 35 up to the cigarette insertion end is filled with a suitable, incombustible material which is gas-permeable. To this end, use may be made of different ceramic materials in a suitable design or quite simply suitably packed temperature-stable, high surface area materials such as glass fibres, particles, or shreds, terracotta, mineral wool or the like. The space between the walls 34, 35 is sealed at the cigarette insertion end but has vent openings 53 to allow air and oxygen intake and gas combustion and exhaust. In the use of this embodiment of the device the "cigarette" 33, as in the preceding case, is inserted in the space 31 and gas is thereafter supplied to the chamber 42 through the valve 45, if so required. The gas flows into the chamber 43 with the igniting means 47 through the valve 46 and is there ignited by manually activating the igniting means 47. The hot gases then flow through the gas-permeable material 48 along the space 31 and enter the ambient atmosphere through the openings 53. The temperature in the space 31 is adjusted by means of the valve 46 which allows the passage of a predetermined amount of gas per unit of time, and optionally by solution of the material 48 and the gas permeability factor thereof. When the gas permeable material 48 is ceramic it is possible to preselect the number and size of the interstices thereof per unit area and thereby to determine the rate of gas flow therein and therethrough and the rate of gas permeation thereof, and thus also the maximum attainable temperature, so that a separate temperature control can be eliminated and a desired minimum temperature maintained by rate and amount of suction applied so long as gas is available in chamber 42. With other gas-permeable materials, the temperature control is not inherently "built-in" and separate temperature control means should accordingly be provided. When the gas-permeable material employed is non-catalytic or catalytic and wholly or partially self-igniting, then no igniting means is necessary whereas, when no part

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of the gas-permeable material 48 is self-igniting, then an ignition means 47 is required.

Fig. 4 illustrates a very simple embodiment of the device according to the invention in which the required heat is produced by means of two liquids 49 and 50 which are enclosed in the space between the walls 34 and 35 and separated by means of a partition 51. The liquids 49, 50 are selected from the group of liquids which produce heat when mixed with each other. In the device according to Fig. 4, the part of the device containing the opening 31 is first bent back and forth, whereby the partition 51 of brittle material is broken and the liquids 49, 50 are mixed with each other so as to generate the required heat. The "cigarette" may of course also be inserted before the wall 51 is broken. In this embodiment, the mouthpiece 32 has micro-size through openings 52 to allow air to enter into the opening 36 through which the nicotine passes to cool the same before entering the mouth.

The above-described devices are made of a suitable heat-insulating material so that the mouthpiece 32 held between the lips will not become too hot and uncomfortable.

Fig. 5 illustrates an embodiment of the device according to the invention which takes the form of a pipe-bowl 10. The pipe-bowl, which may be made of wood or any other suitable material, defines in a conventional way a cup-shaped cavity 11 having a gas outlet 12 adjacent its bottom and an air inlet 13. The air inlet 13 may also be arranged in a cover 15 to be placed on the top face of the pipe-bowl 10. Along its sides and bottom, the cavity 11 has a heating element 14, e.g., in the form of a heating coil. This heating coil is connected to a battery 16 by an electronic circuit 17 including a manually operable switch and sensor (not shown) operating in the same way as the sensor 41. The battery is maintained in place by means of a screw plug 18. A pipe-stem 19 is connected to the bowl 10 by a threaded portion 20. The device according to Fig. 5 functions in substantially the same manner as the device according to Fig. 2, except for the fact that loose tobacco, and not a "cigarette", is placed in the receiving space 11.

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CLAIMS

1. Tobacco compositions for liberating essentially pure nicotine in effective amounts when air is drawn therethrough and when subjected to elevated temperatures below the combustion temperature of the tobacco, for inhalation purposes, comprising a mixture of tobacco, water, basic material and optionally oil, detergents and/or flavoring agents.
2. Composition according to claim 1 characterized in that the water is present in the form of a water-containing salt.
3. Compositions according to claim 1 or 2 characterized in that the water-containing salt is selected from the group consisting of soda and zeolites.
4. Composition according to claim 3 characterized in that the water and the basic material is present in the form of Na_2CO_3 10 H_2O.
5. Composition according to claim 4 characterized in that the pH of the composition exceeds 7 and preferably 8.8.
6. Composition according to any of the claims 1-3 characterized in that the basic material is selected from the group consisting of carbonates and hydroxides of sodium, potassium and calcium.
7. Composition according to any of the preceding claims characterized in that the water is present in 0.25-7 g, preferably 1-5, g H_2O/g tobacco.
8. Composition according to claim 1 characterized in that the water is present in the form of heat-sensitive micro-capsuls.
9. A method of liberating essentially pure nicotine from tobacco compositions comprising the step of mixing a tobacco material optionally containing oil, a detergent and/or a flavoring agent with water and a basic substance optionally dissolved or dispersed in the water and heating the composition obtained to an elevated temperature below the combustion temperature of the tobacco but sufficiently high to liberate an effective amount of nicotine when air is drawn through the composition for inhalation purposes.
10. A method according to claim 1, wherein the temperature varies between 30 and 200°C preferably between 50 and 100 and the water before the heating step is present in the form of water-containing salts such as soda or zeolite, which upon the heating liberate the water.

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11. Device for the release and administration of nicotine in gaseous form, comprising receiving means (10, 30) which has a receiving space (11, 31) provided therein with an inlet and an outlet (12, 36) and in which a matrix containing the nicotine is insertable, and a mouthpiece (19, 32) communicating with the outlet (12, 36) of said receiving space, characterized by a heating element (14; 40; 48, 49, 50) associated with said receiving space (11, 31), said element being adapted to produce heat in said space (11, 31), said heating element itself or subsidiary temperature control means (17; 41) being selected or provided for restricting the temperature in the receiving space (11, 31) to a predetermined value below the combustion temperature of the matrix.
12. Device as claimed in claim 11, characterized in that the heating elements (40) consists of a heating coil connectible to a battery (39) and disposed in the wall defining the receiving space (31).
13. Device as claimed in claim 11, characterized in that the heating element (46, 47) consists of a gas burner with an igniter (47) which is adapted to ignite gas flowing from a gas space (42) through a control valve (46) to a channel (43) communicating with the ambient atmosphere and containing a gas-permeable material (48) and adjoining the receiving space (31).
14. Device as claimed in claim 13, characterized in that the gas-permeable material (48) consists of a catalytic combustion matrix.
15. Device as claimed in claim 13, characterized in that the gas-permeable material (48) consists of mineral wool.
16. Device as claimed in claim 11, characterized in that the heating element consists of a container holding two fluids (49, 50) separated by a rupturable partition (51) and selected from the group of fluids which produce heat when mixed.
17. Device as claimed in claim 16, characterized in that the fluids (49, 50) consist of lithium chloride and water.
18. Device as claimed in claim 16, characterized in that the temperature restricting means consists of a temperature sensor (41) connected to the battery (39).
19. Device as claimed in claim 13, characterized in that the control valve (46) between the gas space (42) and the channel (43) constitutes the temperature restricting means.

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20. Device as claimed in claim 16, characterized in that the ratio between the fluid volumes constitutes the temperature restricting means.
21. Device as claimed in any of the claims 11-20, characterized in that the mouthpiece (32) is perforated with micro-size holes (52).
22. Device as claimed in any of the claims 11-21 characterized in that the heating element (14; 40; 48; 49; 50) is adapted to produce heat upon manual activation.

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FIG. 1

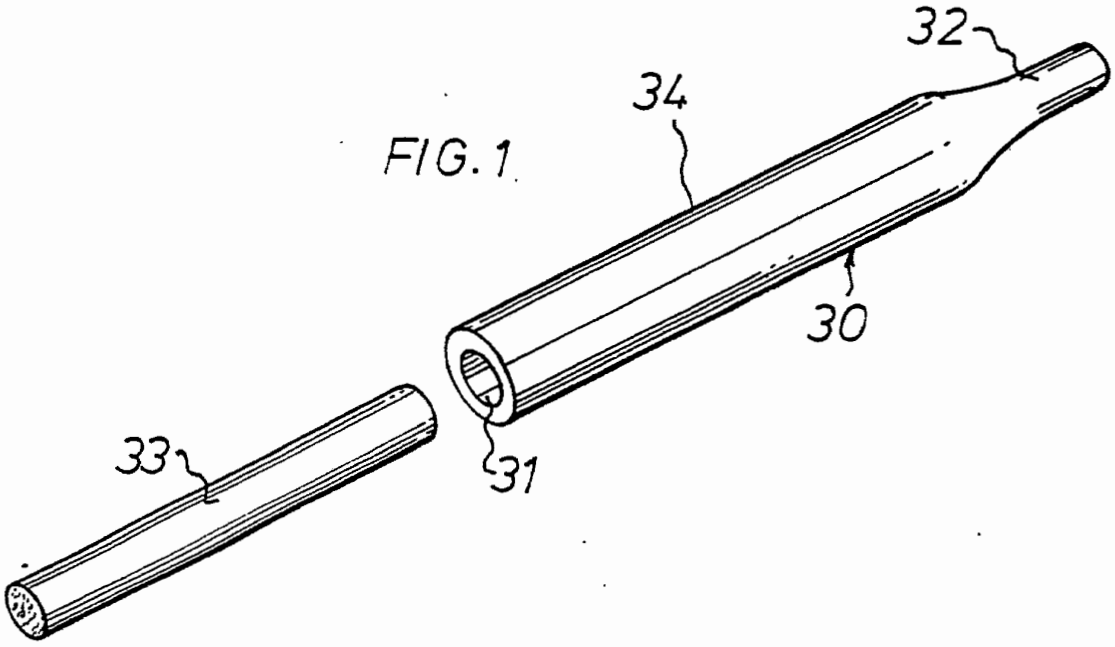
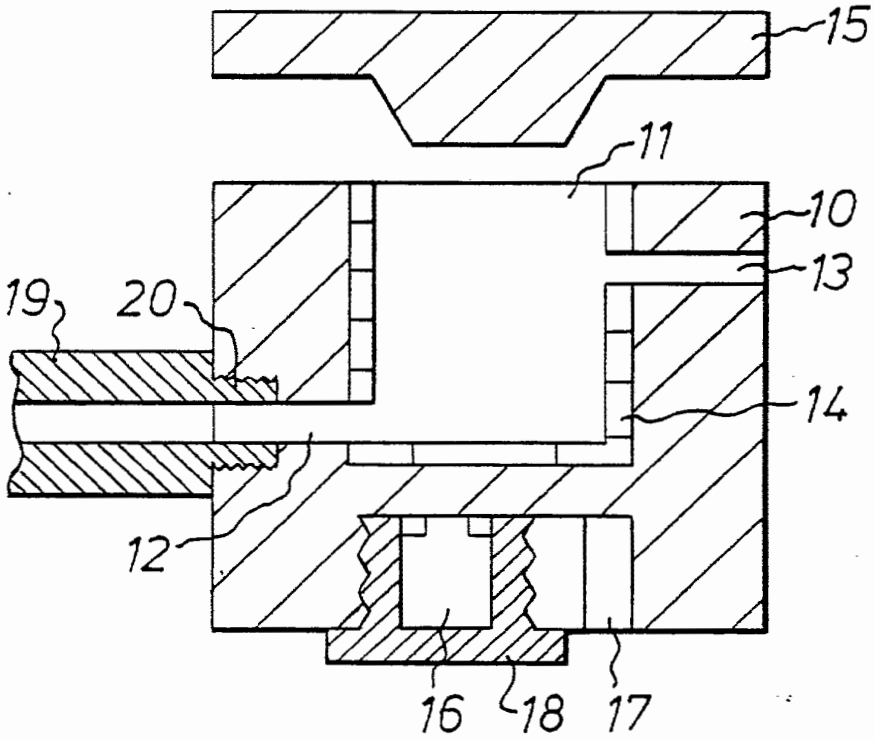


FIG. 5



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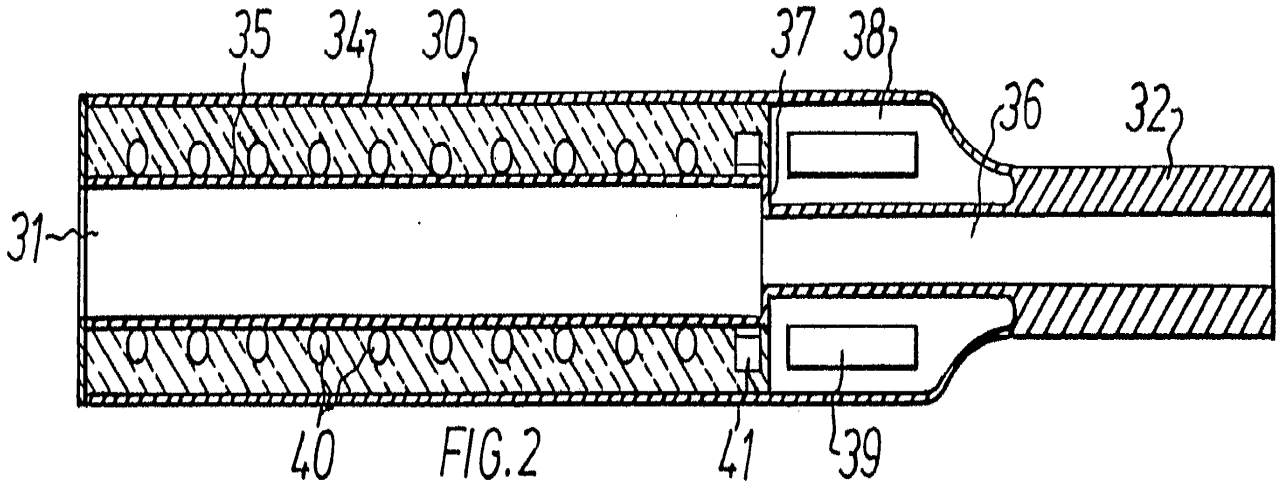


FIG.2

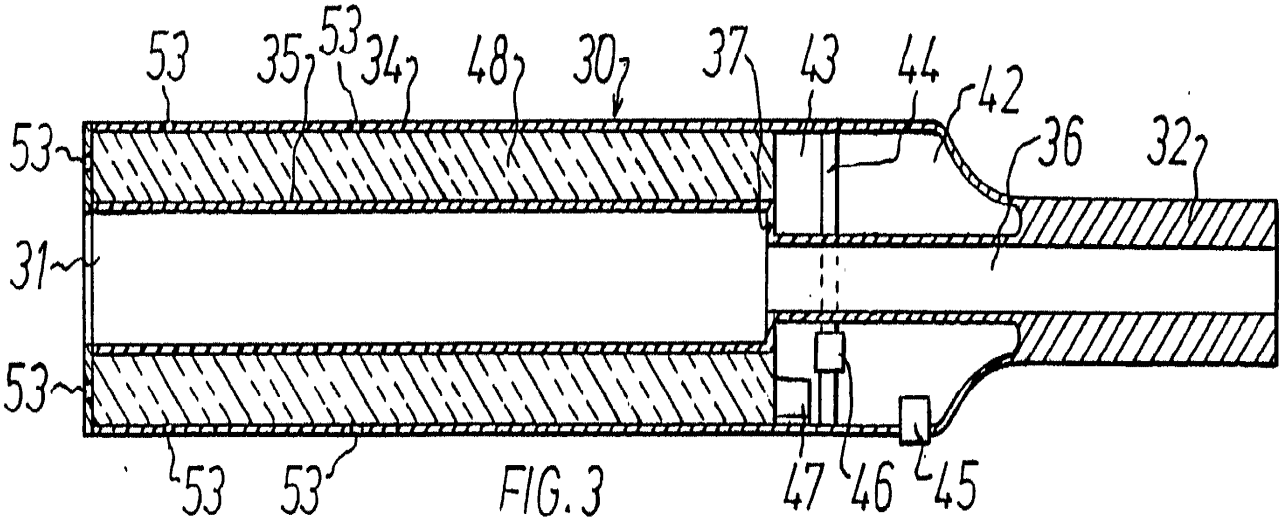


FIG.3

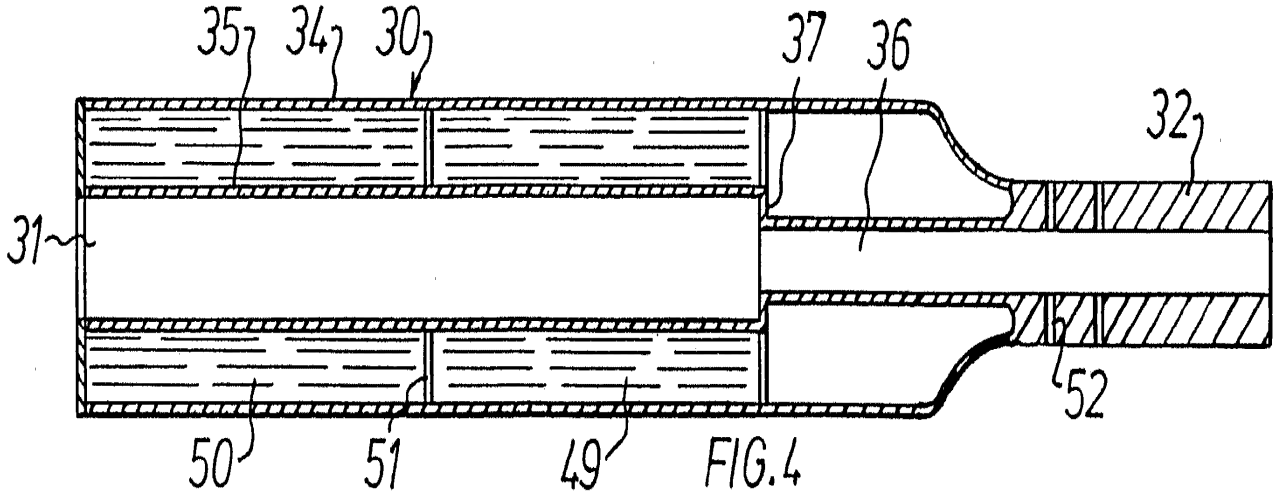


FIG.4

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INTERNATIONAL SEARCH REPORT

International Application No PCT/SE85/00424

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) [5]

According to International Patent Classification (IPC) or to both National Classification and IPC [4]

A 24 B 15/18, A 24 D 1/00

II. FIELDS SEARCHED

Minimum Documentation Searched [7]

Classification System	Classification Symbols
IPC 2	A 24 B 15/02
IPC 4	A 24 B 15/00, /10-/18, /24-/32, /42; A 24 D 1/00, /04, /08, 3/18; A 24 F 1/00-13/26 .../...

Documentation Searched other than Minimum Documentation to the Extent that such Documents are included in the Fields Searched [8]

SE, NO, DK, FI Classes as above

III. DOCUMENTS CONSIDERED TO BE RELEVANT [9]

Category *	Citation of Document, [11] with indication, where appropriate, of the relevant passages [12]	Relevant to Claim No. [13]
X	DE, C, 116, 941 (DR.R.KISSLING & CO, BREMEN) 9 January 1900	1-10
X	US, A, 2 972 557 (HARRY. A. TOULMIN, JR., DAYTON, OHIO) 21 February 1961	1-10
X	GB, A, 1 316 987 (I. BURSZTYN. ISRAEL) 16 May 1973	1-10
X	GB, A, 1 116 644 (PHILIP MORRIS INC.) 12 June 1968 & NL, 6511755 DE, 1517320 CH, 475725	1-10
X	FR, A, 2 099 824 (GALLAHER LIMITED) 17 March 1972 & GB, 1289766 BE, 768645	1-10
X	US, A, 3 292 636 (UNION CARBIDE CO.) 20 December 1966	3

.../...

* Special categories of cited documents: [10]

"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

"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

IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
1986-01-13	1986 -01- 17
International Searching Authority	**Signature of Authorized Officer**
Swedish Patent Office	Yvonne Siösteen / Ingrid Falk /Yvonne Siösteen/

Form PCT/ISA/210 (second sheet) (January 1985)

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FURTHER INFORMATION CONTINUED FROM THE SECOND SHEET

II Fields Searched (cont.)

US Cl 131:1, 2, 3, 5, 7, 8, 10, 17, 143, 170, 171, 173-175, 194-196, 270-273, 328-371;
128:202.21.

V. ☐ OBSERVATIONS WHERE CERTAIN CLAIMS WERE FOUND UNSEARCHABLE [1]

This international search report has not been established in respect of certain claims under Article 17(2) (a) for the following reasons:

1. ☐ Claim numbers ....., because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claim numbers ....., because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claim numbers ....., because they are dependent claims and are not drafted in accordance with the second and third sentences of PCT Rule 6.4(a).

VI. ☐ OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING [2]

This International Searching Authority found multiple inventions in this international application as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims of the international application.

2. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims of the international application for which fees were paid, specifically claims:

3. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claim numbers:

4. ☐ As all searchable claims could be searched without effort justifying an additional fee, the International Searching Authority did not invite payment of any additional fee.

Remark on Protest

☐ The additional search fees were accompanied by applicant's protest.

☐ No protest accompanied the payment of additional search fees.

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III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)

Category *	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No
X,Y	US, A, 4 303 083 (BURRUSS, ROBERT) 1 December 1981	11-22
X	US, A, 4 141 369 (BURRUSS, ROBERT) 27 February 1979	11-22
Y	US, A, 4 219 032 (TABATZNIK, ROBERT) 26 August 1980	11-22
Y	EP, A1, 155 514 (EFKA-WERKE FRITZ KIEHN GMBH) 25 September 1985 & BE, 901833 SE, 8500796 FR, 2560015 DE, 3407461 NL, 8500494 DE, 3410039	11-22

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Office européen des brevets

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A2

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(54) Aerosol delivery articles utilizing electrical energy.

(57) Aerosol delivery articles employ an electrical resistance heating element and an electrical power source to provide an aerosol. The articles advantageously comprise a disposable portion and a reusable controller. The disposable portion normally includes a drug or flavor substance and an air permeable resistance heating element having a surface area greater than 1 m^2/g, which usually carries an aerosol forming substance. The reusable controller normally includes a puff-actuated current actuation means, a time-based current regulating means to control the temperature of the heating element, and a battery power supply.

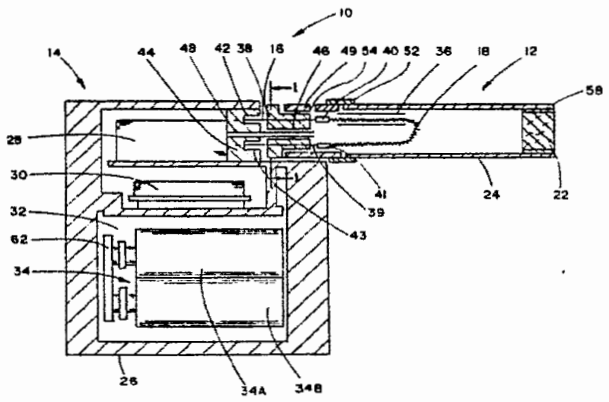


FIG. 1

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AEROSOL DELIVERY ARTICLES UTILIZING ELECTRICAL ENERGY

BACKGROUND OF THE INVENTION

The present invention relates to aerosol delivery articles which employ an electrical resistance heating element and an electrical power source to produce an aerosol. Articles of the present invention can deliver a flavored aerosol or a drug in aerosol form.

Over the years, there have been proposed numerous smoking products, flavor generators and medicinal inhalers which utilize electrical energy to vaporize or heat a volatile material for delivery to the mouth of the user.

U.S. Patent No. 2,057,353 to Whittemore, Jr. proposed a vaporizing unit. In particular, a wick reportedly carried liquid medicament by capillary action to a point where the liquid was vaporized by an electrical resistance heating element.

U.S. Patent No. 2,104,266 to Mccormick proposed an article having a pipe bowl or cigarette holder which included a resistance coil (i) wound on an insulating and heat resisting material, and (ii) contained in an insulated chamber. Prior to use of the article, the pipe bowl was filled with tobacco or the holder was fit with a cigarette. Current then was passed through the resistance coil. Heat produced by the resistance coil was transmitted to the tobacco in the bowl or holder, resulting in the volatilization of various ingredients from the tobacco. A thermostatic switch was employed to maintain a predetermined temperature range to which the tobacco was heated.

U.S. Patent No. 3,200,819 to Gilbert proposed a smokeless, non-tobacco cigarette having a flavor cartridge, such as a porous substrate impregnated with mentholated water. The article included a battery for powering a tube or bulb which was illuminated before assembly. The bulb was placed in a tubular liner, which was in turn located within a tube of plastic having the size, color and form of a cigarette. In use, the illuminated bulb reportedly heated the flavored air drawn through passages formed between the bulb and the tubular liner. As such, warm, moist, flavored air was delivered to the user.

French Patent Publication No. 2,128,256 to Ribot et al proposed an article for delivering denicotinized smoke. The proposed article included a sealed ampule which contained pressurized denicotinized smoke. An electric resistor was immersed in the smoke. In use, the terminals of the resistor were pushed into contact with a microbattery causing the resistor to generate heat and heat the smoke within the ampule. Draw by the user reportedly caused warm smoke to exit a valve near the mouthend of the article.

Japanese Patent Publication 8231/73 to Takeda proposed a cigar-shaped inhaler which included a battery powered Nichrome wire to heat air that, in turn, evaporated an essence from an essence container. The Nichrome wire was energized by either a manually-actuated or a draw actuated "on-off" switch.

West German Patent Application No. 2,653,133 to Kovacs proposed a smoking simulator having an internal battery which could accelerate or control the vaporization or emission of aromatic substances for delivery to the user. In supplemental West German Patent Application No. 2,704,218, Kovacs described the use of a vacuum or draw-actuated switch to switch "on" the battery operated heating coil.

A draw actuated, pressure transducer switch was described in U.S. Patent No. 4,246,913 to Ogden et al, as part of a smoke aversion therapy article which delivered a small electrical shock to a smoker whenever the smoker drew on a cigarette.

U.S. Patent No. 4,141,369 to Burruss proposed an article similar to the previously discussed McCormick articles. Burruss proposed a container which was electrically heated to a temperature sufficient to volatilize desired components from smoking material inserted therein. Heated air passing through the container during draw reportedly carried volatilized materials to the mouth of the user.

U.S. Patent No. 4,303,083 to Burruss proposed a pipe having an electrical resistance heating element, a manually operated "on-off" power switch, and an opening above the resistance element for the addition of volatile compound. During use, the volatile compound was applied, using a squeeze tube or eye dropper, to a heated surface within the pipe, apparently on a puff-by-puff basis. The volatile compounds reportedly were vaporized, mixed with air drawn into the pipe, and inhaled by the user.

PCT Publication No. WO 86/02528 to Nilsson et al proposed an article similar to that described by McCormick. Nilsson et al proposed an article for releasing volatiles from a tobacco material which had been treated with an aqueous solution of sodium carbonate. The article resembled a cigarette holder and reportedly included a battery operated heating coil to heat an untipped cigarette inserted therein. A switch was activated to supply current to the heating coil. A temperature sensor reportedly disconnected and reconnected the battery in order to maintain the temperature generated by the device in a narrow temperature range. Air drawn through the device reportedly was subjected to

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elevated temperatures below the combustion temperature of tobacco and reportedly liberated tobacco flavors from the treated tobacco contained therein.

U.S. Patent No. 4,735,217 to Gerth et al proposed a "cigarette-shaped" medicament dosing article having a pellet of vaporizable medicament and a Nichrome resistance heating element connected in series with a battery power source and a draw actuated switch. In their only working example, the Nichrome heating element allegedly achieved a temperature in the range of 190°F to 220°F (90°C to 105°C) within a two second puff, which apparently was sufficient to volatilize menthol from a menthol pellet. At Column 8, lines 43-63, Gerth et al. went on to speculate that their article could be used to vaporize nicotine from a nicotine-containing pellet and that they believed it feasible to coat the heating element with a nicotine-containing compound in lieu of using a vaporizable pellet.

However, it is believed that it would not be possible to coat a Nichrome heating element, of the type described by Gerth et al, with enough vaporizable liquid material to deliver sufficient volatile material to the user, over a 6 to 10 puff life. It also is believed that the article of Gerth et al would not be able to provide enough electrical energy to (i) vaporize volatile material until near the end of a typical two second puff, or (ii) provide a high enough temperature (e.g., 150°C to 350°C) to vaporize many volatile materials within a two second puff, including many desirable aerosol forming substances and many volatile flavor components. In addition, even with only a single AA battery, the article described by Gerth et al. is more than 3 times the diameter and many times heavier than a typical cigarette and is provided with a relatively imprecise draw actuated control switch and with no means of regulating the current or heat during the puff.

Despite many years of interest and effort, none of the foregoing articles employing electrical energy has ever realized any significant commercial success, and it is believed that none has ever been widely marketed. Moreover, it is believed that none of the foregoing electrical energy articles is capable of effectively providing acceptable drug or flavor delivery to the user, especially a 6 to 10 puff, or greater, product life.

Thus, it would be desirable to provide an aerosol delivery article which utilizes electrical energy and which is capable of delivering acceptable quantities of aerosol over at least 6 to 10 puffs.

SUMMARY OF THE INVENTION

The present invention relates to drug and flavor delivery articles which employ an electrical resistance heating element and an electrical power source to provide an aerosol. Preferred articles can produce aerosol almost immediately upon commencement of a puff, as well as provide the controlled production of aerosol throughout the puff and over a 6 to 10 puff product life.

In one aspect of the invention, the aerosol delivery article includes a disposable portion (eg., a cartridge) which utilizes an air permeable high surface area electrical resistance heating element that normally carries aerosol forming substances prior to use. This resistance heating element typically is a porous material having a surface area greater than 1 m^2/g, as determined using the Brunaver, Emmett and Teller (BET) method described in J. Am. Chem. Soc., Vol. 60, p. 309 (1968); and Adsorption Surface Area and Porosity, Gregg et al, Academic Press, NY (1967). Preferably, the heating element is a fibrous carbon material, most preferably having a surface area greater than about 1,000 m^2/g. (In contrast, the surface area of the Nichrome metal resistance element of Gerth et al is believed to be about 0.01 m^2/g.) Preferably, such porous heating elements are impregnated with (i) liquid aerosol forming substances, such as glycerin, and (ii) a flavor such as a coffee extract or menthol, or a drug constituent. Such heating elements are particularly advantageous in that they are capable of holding and efficiently releasing relatively large quantities of liquid aerosol forming substances as well as drug or flavor substances. For example, such heating elements can carry enough aerosol forming substances to provide aerosol for 6 to 10 puffs, or more.

Another important aspect of the invention relates to the various configurations of the disposable portions described herein. For example, in certain preferred embodiments, the disposable portion advantageously is provided with an electrical connection means at one end thereof. This electrical connection means includes means for connecting the resistance element to a battery or other external power source, and preferably includes an air passageway used in conjunction with the preferred puff actuated current actuation means. In other preferred embodiments, the disposable portion is adapted for connection to the external power source via connectors located on the reusable controller. In certain preferred embodiments, the resistance heating element is located centrally in the disposable portion and/or does not occupy a significant portion of the cross-sectional area of the disposable portion. In other preferred embodiments, the resistance heating element is located adjacent an end of the disposable portion, and/or at least substantially fills the cross-sectional area of the disposable portion or the air passageway there-

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through.

A reusable controller can be used with the disposable portions of the invention. This reusable controller normally includes a current actuation means, a separate current regulating means to control the temperature of the heating element, and a battery power supply. Alternatively, the electrical power supply can be provided separately from the current actuation and current regulating means; e.g., as a separate battery pack or as normal household current stepped down by an appropriate transformer. The reusable controller can be in the form of a pipe, a reusable mouthpiece, a hand-held unit or other portable form into which the disposable portion can be inserted. The use of such a reusable article with the disposable portions of the invention is particularly advantageous in that it permits the use of (i) relatively large power sources, capable of generating 10 to 40 watts of power or more, and (ii) accurate and sophisticated current actuation and current regulating means that normally would be too costly to incorporate into a single use, disposable article.

Preferably, the current actuation means is puff actuated, so that current flows through the resistance heating element to produce aerosol only during draw by the user.

To use the articles of the invention, the user simply inserts the disposable portion containing the drug or flavor substance into the controller, to electrically connect the heating element to a circuit including the current actuation and current regulating means and to the battery. When the user draws on the mouthend of the article, the preferred current actuation and current regulating means permit unrestricted or uninterrupted flow current through the resistance heating element to generate heat rapidly. This heating volatilizes the aerosol forming substances and/or drug or flavors, which in turn form an aerosol and pass through the article and into the mouth of the user. At the same time, the current regulating means (i) regulates current flow through the heating element to control heating of the resistance element and the temperature experienced thereby, and (ii) prevents overheating and degradation of the aerosol former. When the user stops drawing on the article, the current actuation means prevents further current flow through the heating element and disables the current regulating means. This process continues, puff after puff, until the user decides to stop drawing on the article (i.e., flavor generation is depleted or the dose of the drug is complete). At that point, the reusable portion can be removed and discarded, and a new one inserted in its place.

In another aspect of the invention, the current actuation means, the current regulating means, and/or the electrical power source may be incorporated into the portion of the article containing the electrical resistance heating element, so that the reusable controller may be reduced in size or even eliminated.

Preferred aerosol delivery articles of the invention are capable of delivering an average of at least 0.5 mg, more preferably at least 0.8 mg, of aerosol and/or drug or flavor substance per puff, measured as wet total particulate matter (WTPM), under conditions of 2 second, 35 ml puffs, taken once every 60 seconds. Preferred articles of the invention can deliver such material, preferably in visible form, for a plurality of puffs, preferably at least about 6 puffs, more preferably at least about 10 puffs, under such conditions.

As used herein, and only for the purposes of this application, "aerosol" is defined to include vapors, gases, particles, and the like, both visible and invisible, generated by action of heat from the resistance heating element upon aerosol forming substances and/or drug or flavor substances located on the resistance element or elsewhere in the article.

The articles of the present invention are described in greater detail in the accompanying drawings and in the detailed description of the invention which follows.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a longitudinal, partial sectional view of an article of this invention;

Figure 1A is a sectional view of a portion of the embodiment shown in Figure 1 taken along lines 1-1;

Figure 2 is a longitudinal, partial sectional view of an article of this invention;

Figure 3 is a perspective of an article of this invention including an exposed inner view of the reusable portion thereof;

Figures 4, 5, and 6 are longitudinal, partial sectional views of preferred articles of this invention showing the disposable portions and cut-away views of the controllers;

Figures 7 and 8 are longitudinal sectional views of additional articles of the invention;

Figures 9 and 10 are representative schematic diagrams of time-based control circuits and related wiring for preferred controllers useful in this invention; and

Figure 11 depicts the temperature, average current voltage profiles experienced by a resistance heating element during heating controlled by the preferred current regulating means.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

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Referring to Figure 1, aerosol delivery article 10 includes a disposable cartridge 12 and a reusable, hand-held controller 14. The disposable cartridge 12 includes electrical connection plug 16, resistance heating element 18 carrying an aerosol forming substance, mouth end filter 22, and a resilient overwrap 24. The preferred controller 14 includes a case 26, a puff actuated current actuation mechanism 28 having the form of a pressure sensitive switch, a time-based current control circuit 30, and a chamber 32 into which battery power supply 34 (shown as batteries 34A and 34B) is inserted.

The resistance heating element 18 employed in cartridge 12 preferably is a fibrous material having a high surface area and an adsorbant, porous, wettable character, in order to carry a suitable amount of aerosol forming substance for effective aerosol formation. Suitable heating elements preferably have surface areas above about 50 m^2/g, more preferably above about 250 m^2/g, and most preferably above about 1,000 m^2/g.

Preferred heating elements normally have low mass, low density, and moderate resistivity, and are thermally stable at the temperatures experienced during use. Such heating elements heat and cool rapidly, and thus provide for the efficient use of energy. Rapid heating of the element also provides almost immediate volatilization of the aerosol forming substance. Rapid cooling prevents substantial volatilization (and hence waste) of the aerosol forming substance during periods when aerosol formation is not desired. Such heating elements also permit relatively precise control of the temperature range experienced by the aerosol forming substance, especially when the preferred time based current control means described herein is employed.

Preferred resistance heating elements include carbon filament yarns available from American Kynol, Inc., New York, NY, as Catalog Nos. CFY-0204-1, CFY-0204-2, and CFY-0204-3. Such yarns reportedly have surface areas of about 1,500 m^2/g and resistivities of about 10 to about 30 milliohm-cm. See, Kirk-Othmer: Encyl. Chem. Tech., Vol. 16, 3rd Ed., pp 135-136 (1981). Representative lengths of such yarns range from about 15 to about 50 mm. Other preferred heating elements include carbon felts and activated carbon felts available from American Kynol, Inc., as Catalog Nos. CN-157(HC), CN-210(HC), ACN-211-10, ACN-210-10, and ACN-157-10. Such felts typically have surface areas of about 1,500 m^2/g and resistivities of about 5 to about 30 milliohm-cm. Such felts can be used in the form of circular discs having diameters of about 4 to 8 mm, as described in greater detail hereinafter with reference to Figures 4-6. Other suitable heating elements include porous metal wires or films; carbon yarns, cloths, fibers, discs or strips; graphite cylinders, fabrics or paints; microporous high temperature polymers having moderate resistivities; porous substrates in intimate contact with resistance heating components; and the like.

Preferably, the heating element 18 is impregnated with or otherwise carries one or more aerosol forming substances in order that the aerosol forming substances are in a heat exchange relationship with the electrical heating element. The aerosol forming substances used in this invention are capable of forming aerosol during periods when the heating element generates heat. Such substances preferably are composed of carbon, hydrogen and oxygen, although other material such as water can be employed. The aerosol forming substances can have a solid, semi-solid, or liquid form. Examples of suitable aerosol forming substances include water; ethanol; polyhydric alcohols such as glycerin, propylene glycol and triethylene glycol; aliphatic esters of mono-,di-, or poly-carboxylic acids such as methyl stearate, dimethyl dodecandioate, dimethyl tetradecandioate; a flavor such as menthol, chocolate, coffee, fruit or artificial fruit; and the like, as well as mixtures thereof; as well as a drug or a mixture of a drug with any of the foregoing aerosol forming substances.

While the loading of the aerosol forming substance can vary from substance to substance and from heating element to heating element, the amount of liquid aerosol forming substance used typically will be greater than about 15 mg and preferably ranges from about 25 mg to about 50 mg.

The flavor substances useful herein are those which are capable of being delivered to the user in aerosol form. Such flavors include menthol, peppermint, spearmint, cinnamon, vanilla, licorice, ginger, mouth fresheners, chocolate, coffee and coffee flavors, liqueurs, root beer, spice, nut, pepper, pizza, bacon, sausage, cereal, popcorn, cookie, strawberry, citrus, raspberry, cherry, tooty fruity, and the like.

Drugs useful herein are those which can be administered in an aerosol form directly into the respiratory system of the user. As used herein, the term "drug" includes articles and substances intended for use in the diagnosis, cure, mitigation, treatment or prevention of disease; and other substances and articles referred to in 21 USC 321(g)-(1). Typical of such drugs are those which are used in the treatment of asthma, emphysema, bronchitis, epilepsy, shock, hypertension, cardiac arrhythmia, sinus congestion, allergies, convulsions, anxiety, schizophrenia, and the like. Examples of suitable drugs include ephedrine, metaproterenol, terbutaline, dopamine, phenytoin, diazepam, pro-

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pranolol, diphenhydramine, and the like.

Such drug and flavor substances can be used as aerosol forming substances, and can be carried by the resistance heating element. Such substances also can be placed between the resistance heating element and the mouthend of the cartridge, such as in mouthend filter 22 or in a separate flavor chamber or cartridge located between the resistance heating element and the filter. In such instances, the substance can either form an aerosol or be eluted by the aerosol forming material. As with the aerosol forming substance, the loading of the flavor substance can vary from substance to substance, and depends upon the taste desired; and the loading of each drug can vary depending upon the particular drug and the particular dose required.

Although drugs can be employed to form an aerosol with or without the other aforementioned aerosol forming substances (e.g., glycerin), it is desirable to employ such aerosol forming substances with drugs in order that an identifiable, visible aerosol is provided. As such, the user readily can identify when a dose of the drug is complete.

A heat resistant, electrically insulative strip, tube or spacer 36, preferably is provided in order to maintain the heating element in place and to prevent the heating element from contacting itself. The insulative spacer 36 can be a cellulosic sheet treated with fire retardant, an aluminum foil having a surface coating of aluminum oxide, an insulative ceramic material, a heat resistant plastic material such as a polyimide, or the like.

The electrical connection plug 16 preferably is manufactured from a resilient, electrically insulative material such as a thermoplastic material. The plug 16 includes two electrical connector pins or prongs 38, 39 connected to the ends of heating element 18 via connectors 40, 41. The pins 38, 39 engage with electrical terminals 42, 43 located in electrical connection receptacle 44 of the controller 14. Plug 16 also includes a passageway 46 through which tube 48 from pressure sensing switch 28 extends. As shown in Figure 1A, pins 38, 39 and passageway 46 are offset with respect to the longitudinal axis of plug 16.

A portion of the length of the electrical connection plug 16 preferably is circumscribed by a collar 49 having the form of a thermoplastic tube, which preferably is friction fit around a portion of the length of the plug. The collar 49 in turn is secured to the remaining portion of the cartridge via overwrap 24 using tipping paper 52 or other appropriate means such as adhesive, a friction fit, or the like. Preferably, the collar 49 includes one or more peripheral air inlet openings 54 which provide a flow of ambient air through the cartridge during draw. Alternatively, the air inlet can be positioned through the extreme inlet end of the cartridge or elsewhere through the periphery of the cartridge, such that drawn ambient air passing through the cartridge to the mouth of the user passes the resistance element.

The mouthend filter 22 is provided for aesthetic purposes. It preferably is a low efficiency filter made from a melt blown thermoplastic such as polypropylene. For example, the filter can be manufactured by pleating a web of nonwoven polypropylene available from Kimberly-Clark Corp. as experimental melt blown, macrofiber polypropylene PP-100-F. Alternatively, the mouthend filter 22 can be manufactured from cellulose acetate tow, or the like. Preferably, the filter material is overwrapped with a paper plug wrap 58.

To maximize aerosol delivery which otherwise would be diluted by radial (i.e., outside) air infiltration through the overwrap 24, one or more layers of non-porous paper can be used to envelop the cigarette. Examples of suitable non-porous papers are cigarette papers commercially available from Kimberly-Clark Corp. as KC-63-5, F878-5, P878-16-2 and 780-63-5. If desired, the overwrap can be a resilient paperboard material, foil-lined paperboard, or the like; and the paperboard can be circumscribed by a cigarette paper wrap.

The reusable controller 14 includes a case 26 or outer housing which provides a convenient and aesthetic holder for the user. The outer housing 26 can have a variety of shapes and can be manufactured from plastic, metal, or the like. Controller 14 includes an insulative receptacle 44 which includes plug-in connectors 42, 43 for engagement with prongs 38, 39 of plug 16. Receptacle 44 also includes tube 48 which is inserted into passageway 46 of plug 16 to be in airflow communication with the internal region of the cartridge. The other end of tube 48 is in airflow communication with pressure sensing switch 28, so that changes in air pressure which occur within the cartridge during draw can be sensed by the switch.

Controller 14 also preferably includes a control circuit 30, which is connected to a puff actuated, differential pressure sensitive switch 28 by electrically conductive wires (not shown), as well as to batteries 34A and 34B via battery terminal 62. The control circuit 30 preferably is time based. That is, the preferred current control circuit preferably is based on controlling the time period during draw during which current passes through the resistance element. This time based control, in turn, controls the temperature experienced by the resistance element and by the aerosol forming substances. Preferred pressure sensitive switches and control circuits, and their connection power source 34 and resistance element 18, are described in greater

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detail hereinafter with reference to Figures 9 and 10.

While the heat needed to volatilize the aerosol forming substance (and the drug or flavor substance in appropriate cases) during a puff varies for each particular substance, sufficient heat usually is necessary, during a puff, to heat the aerosol forming substance to a temperature above about 120 ° C in order to volatilize an appropriate amount of the aerosol forming substance. More typically, a temperature above about 150 ° C, often above about 200 ° C, and sometimes as high as about 300 ° C to about 350 ° C, is necessary to volatilize adequate amounts of the aerosol forming substance during a puff. However, it is desirable to avoid heating the aerosol forming substance to temperatures substantially in excess of about 550 ° C in order to avoid degradation and/or excessive, premature volatilization of the aerosol forming substance.

For a particular resistance heating element and a particular aerosol forming substance, a sufficient current is required, during each puff, to generate the heat necessary to volatilize enough aerosol forming substance to provide an adequate amount of delivered aerosol. For the preferred aerosol forming substances and the preferred carbon heating elements described herein, an 18 volt battery usually generates sufficient power (i.e., about 18 watts) to heat the aerosol forming substance to a suitable temperature to volatilize the aerosol forming material almost immediately after current actuation, i.e., within about 0.5 second, preferably within about 0.1 second. The 18 volt battery can be provided using two fully charged 9 volt manganese dioxide-zinc transistor batteries (as shown in Figure 1) or three 6 volt lead acid batteries. Also useful is a silver-zinc alkaline battery using potassium hydroxide as an electrolyte and having about 12 to about 15 single cells connected in series, wherein the surface area of each positive electrode is about 3.25 cm^2. Other batteries can include nickel-zinc or nickel-cadmium batteries.

In use, the user inserts the plug 16 of the cartridge 12 into the receptacle 44 of the controller 14. Such action provides electrical connection of the resistance heating element 18 with the switch 28, the control circuit 30 and the batteries 34A and 34B. Such action also provides for airflow communication between the switch 28 and the inner portion of the cartridge. When the user puffs on the mouthend of the cartridge, ambient air enters the cartridge through air inlet 54. The pressure actuated switch 28 responds to a sensed change in air pressure within the cartridge during draw and permits current flow through the heating element 18. As a result, the heating element experiences an increase in temperature which in turn heats and volatilizes the aerosol forming substance. The volatilized aerosol forming substance mixes with the drawn air and forms an aerosol. The volatilized aerosol forming substance (in aerosol or vapor form) exits the mouthend filter 22 into the mouth of the user. During the puff, the preferred current control circuit (described in detail hereinafter) regulates the flow of current to control the temperature experienced by the heating element and the amount of aerosol forming substance which is volatilized.

If the drug or flavor substance is carried by the resistance heating element, it normally volatilizes and passes to the mouth of the user in a manner similar to the aerosol forming substance. If not carried by the resistance heating element, the drug or flavor substance is either volatilized by heat generated by the resistance heating element or eluted by the aerosol forming material as the aerosol forming material passes through the article.

When the user stops drawing on the cartridge, the pressure actuated switch 28 again responds to the sensed change in air pressure within the cartridge, and further current flow through the heating element ceases. As a result, the temperature of the heating element and the aerosol former quickly drop below the volatilization temperature of the aerosol former, and aerosol formation ceases. This process continues, puff after puff, normally for at least about 6 puffs, until aerosol delivery drops below (i) the level desired by the user, or (ii) the dosing level required by the user. Then, the user can remove the cartridge 12 from the control pack 14, and dispose of the cartridge. The user then can select a new cartridge, insert the new cartridge into the reusable controller, and repeat the aerosol delivery process.

The embodiment illustrated in Figure 2 is generally similar to the embodiment of Figure 1, except that the heating element 18 is positioned within a heat resistant, insulative tube 66. The insulative tube 66 preferably is manufactured from a ceramic, a heat resistant cellulosic, an aluminum tube having a surface coating of aluminum oxide, a high temperature plastic such as a polyimide, or the like. Preferably, a plasticized cellulose acetate tube 68 circumscribes the insulative tube 66, and is itself circumscribed by paper overwrap 24. This embodiment also includes tipping overwrap 70 circumscribing the mouthend of the cartridge in order to attach filter element 22 to the remaining portion of the cartridge.

Referring to Figure 3, the illustrated embodiment is generally similar to the embodiment of Figure 2, except that the controller or power pack 14 includes a flexible, cord-like connector 72 which terminates in a plug 74 having prongs 76, 77 for electrical connection into a receptacle 79 at one

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end of cartridge 12. A needle-like tube 48 extends from switch 28 and extends through resilient overwrap 24 in order that changes in air pressure within the cartridge during draw can be sensed by the switch. If desired, the tube 48 can be incorporated into the cord-like connector 72 and extend into the cartridge through the recepticle 79. With such a design, it is possible for the user to place the control pack in a shirt pocket or on a table, and hold the cartridge in a normal fashion, without holding the added weight of the control pack in his/her hands. A light emitting diode 81 is positioned near the differential switch 28. The diode 81 is electrically connected to the electrical circuitry (as described hereinafter) such that it emits light during draw. As such, the user has a visual means for identifying periods when current passes through the resistance heating element 18.

Referring to Figure 4, the illustrated embodiment is generally similar to the embodiment of Figure 1, except that the heating element 18 is a circular disc or pad, preferably formed from an American Kynol carbon felt. The pad is permeable to airflow, and is disposed across an air passageway 83 in tubular collar 49 so that drawn air entering the cartridge 12 through opening 54 passes through the heating element 18. Electrical connection pins 85, 86 from plug 74 contact the heating element and help hold it in place against collar 49. In this embodiment, the collar 49 can be a thermoplastic material, a thermally stable plastic material, a ceramic, or the like.

The embodiment illustrated in Figure 5 is generally similar to the embodiment of Figure 1. In this embodiment, the heating element 18 is a circular disc or pad of carbon felt disposed across an air passageway 83 extending through tubular collar 49. The pad is held in place by shoulder 84 on the collar 49. In addition, the cartridge does not have an electrical connect plug. Instead, electrical connection pins 85, 86 for the heating element extend from a plug 74 located on the controller 14. The cartridge 12 is held in place relative to the controller 14 via a clip 89 extending from the controller, or other suitable connection means.

The embodiment illustrated in Figure 6 is generally similar to the embodiment of Figure 5, except that the pressure sensing tube 48 also is used as one of the connecting pins (e.g., in lieu of connection pin 86 of Figure 5).

Referring to Figure 7, aerosol delivery article 10 has the form of a pipe. The pipe includes a stem 90 having an air passageway 91 and a bowl 92 into which a disposable cartridge 94 is inserted. The bowl and stem can be manufactured from briarwood, or the like. The pipe 10 includes power source 34, such as one or more batteries, pressure sensing switch 28, pressure sensing passageway 93, current control circuit 30, and electrical pins 85, 86 extending from the bottom of the bowl. Preferred pressure sensing current control circuits and their connection to power source 34 and heating element 18 are described in greater detail hereinafter with reference to Figures 9 and 10.

The cartridge 94 includes an outer tubular housing 96 connected to a collar 98 which in turn supports resistance element 18 and the aerosol forming and drug or flavor substances at one end of the cartridge. The resistance element 18 can be a carbon fiber felt pad which extends perpendicularly to the longitudinal axis of the cartridge so that drawn air passes through the resistance element. The disposable cartridge 94 is positioned within the bowl 90, with the resistance heating element 18 positioned near the bottom of the bowl so that the electrical connection pins 85, 86 extending from the bowl contact the resistance element.

Referring to Figure 8, the illustrated embodiment is generally similar to the embodiment of Figure 7. In this embodiment, the resistance element 18 is positioned towards the air inlet end of the cartridge (i.e., remote from the bottom of the bowl) rather than near the air outlet end of the cartridge. In this case, the electrical connection pins 85, 86 extend from the bottom of the bowl to contact the resistance element 18.

The foregoing embodiments preferably incorporate the preferred circuit shown schematically in Figure 9. In particular, the circuit of Figure 9 includes a power source 34, the electrical resistance heating element 18, a current actuation mechanism 28, and a preferred current regulating circuit or means for controlling the passage of current through the resistance element during periods of current actuation.

The circuit includes a puff actuated control switch 28, or some other suitable current actuation/deactuation mechanism, such as a manually actuated on-off switch, a temperature actuated on-off switch, or a lip pressure actuated switch. The preferred puff actuated switch 28 enables current to pass through the heating element 18 only during draw on the article. A typical puff actuated switch includes a means for sensing the difference in air pressure in a region within the previously described cigarette or disposable cartridge and an "on-off" switch responsive thereto.

A preferred puff actuated switch 28 is a pressure differential switch such as Model No. MPL-502-V, range A, from Micro Pneumatic Logic, Inc., Ft. Lauderdale, Florida. Another suitable puff actuated mechanism is a sensitive pressure transducer (eg., equipped with an amplifier or gain stage) which is in turn coupled with a comparator for detecting a predetermined threshold pressure. Yet another suitable puff actuated mechanism is a

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vane which is deflected by airflow, the motion of which vane is detected by a movement sensing means. Yet another suitable actuation mechanism is a piezoelectric switch. Also useful is a suitably connected Honeywell Microswitch Microbridge Airflow Sensor, Part No. AWM 2100V from Microswitch Division of Honeywell, Inc., Freeport, Ill. Other suitable differential switches, analog pressure sensors, flow rate sensors, or the like, will be apparent to the skilled artisan.

The current regulating circuit preferably is time based. Normally, such a circuit includes a means for permitting uninterrupted current flow through the heating element for an initial time period during draw, and a timer means for subsequently regulating current flow until draw is completed. Preferably, the subsequent regulation involves the rapid on-off switching of current flow (eg., on the order of about every 1 to 50 milliseconds) to maintain the heating element within the desired temperature range. Alternatively, the subsequent regulation involves the modulation of current through the heating element to maintain the heating element within a desired temperature range.

One preferred time-based current regulating circuit preferably includes a transistor 110, a timer 112, a comparator 114, and a capacitor 116. Suitable transistors, timers, comparators and capacitors are commercially available and will be apparent to the skilled artisan. Exemplary timers are those available from NEC Electronics as C-1555C and from General Electric Intersil, Inc. as ICM7555, as well as various other sizes and configurations of so-called "555 Timers". An exemplary comparator is available from National Semiconductor as LM311.

In the preferred circuit of Figure 9, the means for determining the length of the initial time period of uninterrupted current flow includes resistors 118, 120, 122 and 124; capacitor 116; and comparator 114. The comparator 114 is powered by connection to entrance pin 128 and to ground pins 130, 132. Resistors 122 and 120 constitute a voltage divider which provides a predetermined reference or threshold voltage at the voltage divider tap 134 (i.e., the common point between resistors 122 and 120). The voltage divider tap 134 is connected to the negative entrance pin 136 of comparator 114. Capacitor 116 is connected in parallel with resistor 124. The parallel combination of capacitor 116 and resistor 124 is connected in series with resistor 118 at one end and to the ground reference point of the power source 34 at the other end. The other end of resistor 118 is connected to power source 34 via switch 28. The common node point between the resistor 118 and the parallel combination of capacitor 116 and resistor 124 is connected to the positive entrance pin 138 of comparator 114.

Resistors 118 and 124 and the capacitance of capacitor 116 are chosen so that the charge rate of capacitor 116 approximates the heating and cooling rate of the resistance heating element 18. The ratio of the resistance of resistor 124 to the sum of the resistances of resistors 118 and 124 sets the maximum voltage to which capacitor 116 can charge. Preferably, the resistances of voltage divider resistors 120 and 122 provide a voltage which is slightly below the maximum capacitor voltage set by resistors 118 and 124.

The timer means for regulating (or interrupting) current flow after the initial time period includes timer 112, diodes 140, 141, resistors 143, 145, and capacitor 147. This timer means generates a periodic digital wave having a preset on-off duty cycle, which is used to rapidly switch the current "on" and "off" at transistor 110 after the passage of the initial time period, to control the temperature range experienced by the resistance heating element.

Timer 112 is powered by connection through entrance pin 149 and ground pin 151. The reset pin 153 of timer 112 is connected to output pin 155 of comparator 114. As a result, the comparator 114 disables the timer during the initial period of uninterrupted current flow. A resistor 157 provides a so-called "pull-up" function for the reset pin 153 of timer 112.

Timer 112 also is connected to diodes 140, 141 at discharge pin 166. Diodes 140, 141 are in turn connected to resistors 145 and 143, respectively. In addition, timer 112 is connected to resistors 143 and 145, and capacitor 147 through trigger pin 168 and threshold pin 169. Capacitor 147 is provided to set the overall time period of the duty cycle. Preferably capacitor 147 is one which charges and discharges at a rapid rate in order that a relatively rapid duty cycle (e.g., in the order of 1 to 50 milliseconds) is provided.

Resistor 145 determines the charge rate of capacitor 147, and thus the "off" period of the duty cycle, while resistor 143 determines the discharge rate of the capacitor and thus the "on" period of the duty cycle. Diode 140 acts to allow current flow from the timer 112 through resistor 145 and to capacitor 147 during periods when the capacitor is charging, and prevents current passage through resistor 145 when the capacitor is discharging. Diode 141 acts to allow current flow from the capacitor 147 through resistor 143 and to the timer during periods when the capacitor is discharging, and prevents current passage through resistor 143 when the capacitor is charging. Thus, the relative on-off duty cycle of the wave form can be varied by selection of the resistances of resistors 143 and 145.

The output pin 159 of timer 112 is connected to resistor 161. The resistor 161 is in turn con-

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nected to the base of transistor 110 in order to limit "on" current through the base-emitter (BE) junction of the transistor. The transistor 110 acts to control the relatively large current which passes through the resistance element 18 from the power source 34 by switching "on" and "off" in response to current flow from the timer.

When draw commences, the puff actuated switch 28 closes to allow current flow through the circuit. The normally "off" transistor switches "on" in response to current flow through the timer 112. This allows current to flow through the resistance heating element 18.

Simultaneously, capacitor 116 begins to charge. When capacitor 116 is charged to the predetermined threshold voltage determined by resistors 120 and 122, which typically occurs in about 1 second, comparator 114 activates timer 112 through reset pin 153. This terminates the uninterrupted current flow to the transistor 110 by switching the transistor "off." At the same time, the timing means begins generating the periodic digital wave form having a preset on-off duty cycle at output pin 159. Such action of the timing means in turn causes the transistor to switch "on" and "off" rapidly, thus rapidly enabling and disabling current flow through the heating element 18. This rapid switching acts to control the average current flow through the heating element, thus controlling the temperature range experienced by the heating element during the balance of a puff.

As described above, the capacitance of capacitor 147 determines the overall time period of the preset duty cycle, while the relative "on" and "off" periods of the duty cycle are determined by the relative resistances of resistors 143 and 145. By varying these resistances, it is possible to closely control the temperature range experienced by the heating element 18, so as to provide a relatively steady state temperature range, or a controlled decrease or increase in the temperature range during the latter portion of a puff.

When draw ceases, puff actuated switch 28 opens to prevent further current flow through the circuit. As a result, the transistor 110 switches to its normally "off" position, thus preventing further current flow through the heating element 18. As a result, the heating element begins to cool, and volatilization of the aerosol forming and/or flavor substance ceases. At the same time, capacitor 116 begins to discharge, preferably at about the same rate at which the heating element cools.

When a subsequent draw commences, the puff actuated switch again closes, thus allowing current to flow through the circuit. If the subsequent draw is taken before the capacitor 116 has discharged completely (i.e., before the heating element has cooled completely), the capacitor 116 preferably recharges to the predetermined threshold voltage at about the same rate at which the heating element heats. This activates timer 112 and terminates the period of uninterrupted current flow at about the same time that the heating element 18 reaches the preferred temperature range. As such, the heating element is prevented from overheating during periods of rapid puffing by the user.

Controllers and aerosol delivery articles of the invention also can incorporate the alternate time-based circuit shown schematically in Figure 10. In particular, the circuit of Figure 10 includes a power source 34, the electrical resistance heating element 18, a current actuation mechanism 28, and a current regulating circuit or means for controlling the passage of current through the resistance element during current actuation.

The preferred current actuation mechanism 28 is a puff actuated control switch of the type described previously.

The current regulating circuit shown in Figure 10 is time based. This circuit includes timer 112, resistors 161, 176, 178 and 180, capacitor 190, and transistor 110.

Exemplary timers have been described previously. The timer 112 is powered by connection through entrance pin 149 and ground pin 151. The output pin 159 of the timer 112 is connected to the base of transistor 110 through resistor 161. The timer 112 is connected to resistor 180 through threshold pin 169; to the node point between resistors 180 and 178 through trigger pin 168; and to the node point between resistors 178 and 176 through discharge pin 166. The node point between resistors 180 and 178 is in turn connected to capacitor 190 which is connected to ground reference point of the power source 34.

The sum of the resistances of resistors 178 and 176 determines the period of uninterrupted current flow through resistance element 18, while the resistance of resistor 176 determines the period during which current flow is prevented from passing through the resistance element. Resistor 180 limits the voltage discharge rate of capacitor 190 so as to limit the initial heating time of the resistance element during a subsequent puff taken a short time after the preceeding puff.

If desired, light emitting diode 81 and resistor 192 can be employed. The light emitting diode 81 is connected in series with resistor 192. The series combination of diode 81 and resistor 192 is connected in parallel with the resistance element 18. The light emitting diode thus illuminates during draw, and the user then can have a visual means for identifying periods when current passes through the resistance element for heat generation. Such light emitting diodes also can be employed in the preferred circuit illustrated in Figure 9.

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When draw commences, the puff actuated switch 28 closes to allow current flow through the circuit of Figure 10. The normally "off" transistor switches "on" in response to current flow through the timer 112, and in turn allows current to flow through the resistance heating element 18.

Simultaneously, capacitor 190 begins to charge. When capacitor 190 is charged to the predetermined voltage determined by resistors 178 and 176, timer 112 acts to switch the transistor 110 and current flow through heating element 18 "off." However, after a further period of time determined by resistor 176, the timer 112 again is turned "on." This process repeats itself until draw ceases. As such, the temperature experienced by the resistance element can be controlled so as to not overheat during a relatively long draw period. For example, a duty cycle can consist of an "on" period of uninterrupted current flow immediately upon draw for about 1.5 to about 2 seconds, followed by an "off" period of about 0.5 to about 1 second. When draw ceases, puff actuated switch 28 opens to prevent further current flow through the circuit. As a result, the transistor 110 returns to its normally "off" position, thus preventing further current flow through the resistance element 18. The resistance element cools, and volatilization of the aerosol forming and/or drug or flavor substance ceases. At the same time, capacitor 190 discharges.

Current regulating means which modulate current flow through the heating element can be employed in place of the previously described on-off time-based circuits. In addition, on-off and current modulating means can be connected to temperature sensors or other sensing means, rather than to a time-based circuit, in order to control the passage of current through the resistance heating element. Such sensors can be temperature sensors such as infrared sensors, piezoelectric films or the like, or thermostats such as bimetallic strips. Such temperature sensors can sense either the temperature of the resistance element directly or the temperature of the air passing the heating element. Alternatively, the temperature sensors can sense the temperature of a second "model" resistance heating element having a heating and cooling character related to that of the aerosol carrying heating element. Another type of sensor which can be employed is a dynamic resistance sensor which senses the change in electrical resistance of the heating element during the heating period.

The following examples are provided in order to further illustrate the invention but should not be construed as limiting the scope thereof. Unless otherwise noted, all parts and percentages are by weight, and all sizes are approximate.

EXAMPLE 1

A flavor delivery article substantially as shown in Figure 2 is prepared as follows:

A. Preparation of the Disposable Portion

End plug 16 is formed from a Delrin plastic cylinder to have a 2 mm long section of 8 mm diameter and a 3 mm long section of 7 mm diameter. The plug is provided with a passageway 46 of sufficient size to receive an 18 gauge needle 48 and two smaller passageways to receive electrical connector pins 38, 39.

The electric resistance heating element 18 is formed from a 32 mm length of carbon filament yarn obtained from American Kynol, Inc., under Catalogue No. CFY-0204-1. This heating element has a resistance of about 20 ohms and a reported surface area of about 1,500 m^2/g. The heating element is impregnated, dropwise, with 25 ul of a liquid aerosol forming substance comprising a mixture of glycerin, propylene glycol and triethylene glycol, and 30 ul of an artificial coffee flavor. The polyhydric alcohol mixture consists primarily of glycerin.

Two 15 mm long crimp connectors 40, 41, including pins 38, 39, are obtained from Black Box Corp., Pittsburgh, PA under Catalog No. GH-FA810. Crimp connectors 40, 41 are attached to each end of the heating element 18. Pin 38 of the first connector 40 is inserted through one of the smaller passageways in the plug 16. The heating element then is folded over a 20 mm long, 5 mm wide strip of Kapton polyimide film 36, to keep the heating element from contacting itself, and pin 39 of the second connector 41 is then inserted through the second small passageway of the plug 16.

A 9 mm long Delrin tube 49 is fabricated from an 8 mm diameter cylinder. One section, 6 mm long, has a 7 mm inner diameter (I.D.), and a second section, 3 mm long, has a 4 mm I.D. A single air inlet hole 54 is made about 4 mm from the 4 mm I.D. end of the tube using a No. 64 drill bit. The 7 mm I.D. end of the tube 49 is then friction fit over the 7 mm end of plug 16.

A 39 mm long, 4 mm outer diameter Kapton polyimide tube 66 is slipped over the resistance element 18 and inserted about 4 mm into the 4 mm I.D. end of the Delrin tube 49. A 36 mm length of a 8 mm O.D. plasticized cellulose acetate tube 68, SCS-1 from American Filtrona Corp., is slipped over the polyimide tube. This tube 68 then is overwrapped with a layer of Kimberly-Clark P-850-192-2 paper 24.

A 10 mm long, low efficiency cellulose acetate

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filter 22 (8 denier per filament, 40,000 total denier) is fastened to the open end of the wrapped tubes with a layer of tipping paper 70. The overall length of the disposable portion 12 is about 55 mm.

B. Assembly of the Controller

A polystyrene housing for the controller is formed to provide chambers for a pressure sensitive switch, a current control circuit, and a battery power supply.

The pressure sensitive switch is the switch portion of a Model No. MPL-502-V, range A, differential switch obtained from Micro Pneumatic Logic, Inc. A 20 mm long 18 gauge steel needle 48 is inserted into the appropriate opening in the switch. A polymethylmethacrylate receptacle 44 having a length of 26 mm, a height of 12 mm and a width of 9 mm is formed with a hole for the gauge needle and fitted with two Black Box Model No. GH-FA820 plug-in connectors 42, 43. The receptacle is slipped over the needle and inserted into an appropriately sized opening in the case.

The control circuit employed is schematically illustrated in Figure 9. It is designed to provide uninterrupted current flow through the heating element for 1 second after the commencement of a puff. During the balance of the puff, the control circuit is designed to alternately switch off for 5 milliseconds and then on for 5 milliseconds (a 50 percent duty cycle), until the pressure actuated control switch opens Comparator 114 is a Model LM 311 obtained from National Semiconductor. As shown in Figure 9, connections are made at entrance pin 128, ground pins 130 and 132, negative entrance pin 136, positive entrance pin 138, and output pin 155. Timer 112 is a Model C-1555C obtained from NEC Electronics. Connections to timer 112 are made at trigger pin 168, threshold pin 169, output pin 159, discharge pin 166, entrance pin 149 and ground pin 151. Transistor 110 is a Model MJE 2955 from Motorola Semiconductor Products. Diodes 140 and 141 are Type IN914 diodes from Fairchild Semiconductor Corp. Capacitor 116 has a capacitance of 2.2 uF. Capacitor 147 has a capacitance of 0.1 uF. The resistances of the resistors 118, 120, 122 and 124 are 1,000,000 ohm; 180,000 ohm; 1,000,000 ohm; and 820,000 ohm, respectively. The resistances of resistors 157, 143, 145 and 161 aze 120,000 ohm; 39,000 ohm; 100,000 ohm; and 1,000 ohm, respectively.

The control circuit is connected to the switch, the receptacle for the plug on the disposable portion, and the battery terminals, as schematically illustrated in Figure 9. The battery supply consists of two 9 volt alkaline transistor batteries connected in series.

C. Use

The end plug 16 is placed against receptacle 44 to electrically connect the disposable portion to the controller and insert the needle into the disposable portion. The mouthend of the disposable portion is placed in the mouth of the user, and the article is drawn upon. The article produces visible aerosol and flavor on all puffs for 8 consecutive puffs.

EXAMPLE 2

An article similar to the article described in Example 1 is prepared, except that (i) the resistance element is a length of Kynol Catalogue No. CFY-0204-1 carbon fiber yarn having a resistance of 28.1 ohms, and (ii) the heating element is impregnated with 35.9 mg of glycerin.

The article is tested under conditions of 2 second, 35 ml puffs, taken every 30 seconds. The article produces visible aerosol on all puffs for a total of 10 puffs, and yields 21.3 mg WTPM.

EXAMPLE 3

Kynol Catalogue No. CFY-0204-2 carbon fiber yarn having a length of about 32 mm has a resistance of 18 ohms, and is used to prepare a heat generating electrical resistance element. The yarn has 18 ul of glycerin applied thereto. Each end of the yarn is electrically connected to an 18 volt/1 ampere limited power source. The arrangement is equipped with the control circuit described in Example 1.

The assembly is actuated such that the resistance element generates heat for a 2 second interval once every 30 seconds. During each puff, the timing mechanism begins to control current flow 1 second after current flow through the resistance element is commenced. The duty cycle provided by the timing mechanism is 10 milliseconds. Maximum current is allowed to flow through the resistance element over one half the duty cycle, and no current is allowed to flow through the resistance element over the other half of the duty cycle. As such, the average current experienced during the timer cycle period is about one half of the maximum current.

Voltage and current levels are measured over time, and the temperature of the resistance element is monitored over time using a Wahl Model HSM-672 IR Spy focused onto the resistance element. Values of the measured and monitored data are recorded, and are presented in Figure 11.

As shown in Figure 11, the maximum tempera-

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ture reached on the first puff is about 200° C, on the second puff about 350° C, and thereafter about 500° C. Moreover, on each puff, the heating element rapidly achieves the maximum temperature and thereafter maintains that temperature during the balance of the puff, after which the element cools to ambient temperature over about a 5 second period.

EXAMPLE 4

A flavor delivery article substantially as shown in Figure 3 is prepared as follows:

A. Preparation of the Disposable Portion

Ceramic receptacle 79 is formed from a 7 mm long, 4 mm diameter section of a ceramic cylinder having two longitudinal, 1.5 mm diameter passageways.

The electric resistance heating element 18 is formed from a length of carbon filament yarn obtained from American Kynol, Inc., under Catalogue No. CFY-0204-2 sufficient to provide a measured resistance of 18 ohms when incorporated into the disposable portion. This element is impregnated with 38 mg of a liquid aerosol forming substance comprising 20 ul of a mixture of glycerin, propylene glycol and triethylene glycol, and 5 ul of an artificial coffee flavor. The ends of the heating element are inserted through the passageways of the receptacle 79 form a loop, and the ends of the element are folded back over the receptacle. A strip of polyimide film 36 is positioned within the loop to prevent the heating element from contacting itself.

Over the resistance element loop and the receptacle 79 is friction fit a Kapton tube of 4 mm O.D. and a length of 80 mm. The length of the polyimide tube then is enveloped to a diameter of about 8 mm with insulative glass fibers 68 obtained from Owens Corning, Toledo, Ohio, as Glass No. 6437. The glass fibers 68 are enveloped by a nonporous cigarette paper wrap 24, available as P-850-192-2 paper from Kimberly-Clark Corp. The diameter of the resulting rod is 8 mm.

At the end of the rod remote from the ceramic receptacle is positioned a low efficiency cellulose acetate tow (8 denier per filament, 40,000 total denier) filter element 22 having a length of about 10 mm and a diameter of about 8 mm. The rod and filter element are held together using tipping paper.

About 1 mm behind the insulative receptacle 79 are pierced several openings 54 through the paper wrap 24 and the polyimide tube 66 to provide air inlet openings for aerosol formation. The perforations are of about 0.8 mm diameter, which is sufficient to provide the disposable portion with a draw resistance of about 100 mm H_2O pressure drop as determined using a Model No. FTS-300 pressure drop tester from Filtrona Corp.

B. Assembly of the Controller

The controller includes a pressure sensitive switch 28, a current control circuit 30, a battery power supply 34A, 34B and a flexible, electric cord 72 which terminates in a cylindrical plug 74.

The cord 72 is a 50 mm length of insulated copper wire. The plug 74 includes a ceramic cylinder, having a length of 10 mm and a diameter of 4 mm with two small passageways extending longitudinally therethrough; and a heat resistant bushing made from Zydar from Dartco Mfg., Inc., Augusta, Georgia. The cylindrical plug has a diameter of about 8 mm. Copper pins 76, 77 connected to cord 72 are inserted through the passageways in the ceramic cylinder to extend 10 mm beyond the face of the plug.

The pressure sensitive switch 28 is a Model No. MPL-502-V, range A, differential switch obtained from Micro Pneumatic Logic, Inc. A 12 mm long, 18 gauge steel needle is inserted into the appropriate opening in the switch.

The control circuit employed is schematically illustrated in Figure 10. It is designed to provide uninterrupted current flow through the heating element for 2 seconds after the commencement of a puff. During the balance of the puff, the control circuit is designed to alternately switch off for 1 second and then on for 2 seconds, until the pressure actuated control switch opens. Timer 112 is a Model C-1555C obtained from NEC Electronics. Connections to timer 112 are made at trigger pin 168, threshold pin 169, output pin 159, discharge pin 166, entrance pin 149 and ground pin 151. Transistor 110 is a Mode1 MJE 2955 from Motorola Semiconductor Products. Capacitor 190 has a capacitance of 22 uF. The resistances of the resistors 176, 178 and 180 are 20,000 ohm; 120,000 ohm; and 68,000 ohm, respectively. Resistors 161 and 192 each have resistances of 1,000 ohm.

The control circuit is connected to the switch, the cord 72, and the battery terminals, as schematically illustrated in Figure 10. The battery supply consists of two 9 volt alkaline transistor batteries connected in series.

C. Use

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The pins 76, 77 of plug 74 are inserted into receptacle 79 to contact the heating element 18 and hence electrically connect the disposable portion to the controller by contacting each end of the resistance element 18. The needle 48 is pierced through the outer wrap 24 and the polyimide tube 66 of the disposable portion. The mouthend of the disposable portion is placed in the mouth of the user, and the article is drawn upon. Visible, flavored aerosol is provided during each puff, and during each puff period, the indicator light illuminates.

EXAMPLE 5

A flavor delivery article substantially as shown in Figure 4 is prepared as follows:

A. Preparation of the Disposable Portion

Electrically insulative plug 16 is formed from a Delrin cylinder to have a 2 mm long section of 8 mm diameter and a 3 mm long section of 7 mm diameter. The plug is provided with a passageway 46 of sufficient size to receive an 18 gauge needle and two smaller passageways to receive electrical connector pins 38, 39.

The pins 38, 39 are gold plated copper pins which extend through the passageways in the plug, beyond the 8 mm O.D. end of the plug, and 3 mm beyond the 7 mm O.D. end. The pins have a flattened bead of silver solder applied at the ends which extend beyond the 7 mm O.D. end.

An insulative collar 49 is formed from a Delrin cylinder having a length of 9 mm and a diameter of 8 mm to a tubular form having a 3 mm segment of 4.5 mm I.D. and a 6 mm segment of 6 mm I.D. A single air inlet 54 is made about 4 mm from the 6 mm I.D. end of the collar.

The electric resistance heating element 18 is formed from a 6 mm diameter circular disc of carbon filament felt obtained from American Kynol as Kynol Activated Carbon Felt ACN-211-10. The resistance element weighs about 8 mm and had a reported resistivity of 20 to 30 ohms-cm. The felt has a liquid, flavored aerosol forming substance applied thereto in a dropwise manner. The aerosol forming substance is 25 ul of a mixture of glycerin, triethylene glycol and propylene glycol, and 20 ul of an artificial coffee flavor.

The resistance element 18 is inserted into the 6 mm I.D. end of the collar 49 to abut against the 4.5 mm I.D. portion of the collar.

The 6 mm I.D. end of the collar 48 then is fit over the narrow end of plug 16 such that the flattened silver solder ends of pins 38 and 39 each contact the resistance element 18.

A resilient paperboard tube having an 8 mm O.D. and a length of 75 mm is abutted against the end of collar 49 opposite plug 16, and the two tubes are held in place using adhesive tape 52.

B. Use

The plug 16 is placed against receptacle 88 of the controller described in Example 1 to electrically connect the disposable portion to the controller and insert the needle 48 into the disposable portion. The mouthend of the disposable portion is placed in the mouth of the user, and the article is drawn upon. Visible aerosol having a coffee flavor is provided on all puffs for 8 puffs.

EXAMPLE 6

A drug delivery article substantially as shown in Figure 2 is prepared using the article described in Example 1, except that the artificial coffee flavor is replaced by 1.25 mg of epinephrine.

EXAMPLE 7

A drug delivery article substantially as shown in Figure 3 is prepared using the article described in Example 3, except that the artificial coffee flavor is replaced by 1 mg of epinephrine.

EXAMPLE 8

A drug delivery article substantially as shown in Figure 4 is prepared using the article described in Example 4, except that the aerosol forming substance is 35 ul of a mixture of 20 parts glycerin and 1 part epinephrine.

Claims

1. A disposable portion of an aerosol delivery article containing a drug or flavor substance for use with a source of electrical power comprising:

a) an electrical resistance heating element having a surface area greater than 1 m^2/g; and

b) aerosol forming substance carried by the heating element prior to use.

2. The disposable article of Claim 1, wherein the heating element has a surface area greater than 50 m^2/g.

3. The disposable article of Claim 1 or 2, wherein the heating element is a fibrous material.

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4. The disposable article of Claim 1 or 2, wherein the disposable article includes an air passageway at least partially therethrough, and the electrical resistance element comprises an air permeable heating element positioned in the passageway.

5. The disposable article of Claim 4, wherein the heating element is positioned substantially perpendicularly to the longitudinal axis of the air passageway.

6. The disposable article of Claim 1, wherein the heating element is adapted for connection to an external source of electrical power.

7. The disposable article of Claim 1, including means for connecting the heating element to an external source of electrical power.

8. The disposable article of Claim 1, including an air outlet for delivering aerosol to the user, and wherein the air outlet and the means for connecting the heating element to the external source of electrical power are at opposite ends of the disposable article.

9. The disposable article of Claim 1, including an air outlet for delivering aerosol to the user and wherein the air outlet and the means for connecting the heating element to the external source of electrical power are at the same end of the disposable article.

10. A disposable portion of an aerosol delivery article containing a drug or flavor substance for use with a source of electrical power comprising:

a) an air passageway at least partially through the disposable portion;

b) an air permeable electrical heating element located in the air passageway; and

c) an aerosol forming substance.

11. The disposable article of Claim 10, wherein the heating element is positioned substantially perpendicularly to the longitudinal axis of the air passageway.

12. The disposable article of Claim 10 or 11, wherein the aerosol forming substance is carried by the heating element prior to use.

13. The disposable article of Claim 10, wherein the heating element is adapted for connection to an external source of electrical power.

14. An aerosol delivery article containing a drug or flavor substance for use with a source of electrical power comprising:

a) an electrical resistance heating element having a surface area greater than 1 m^2/g;

b) aerosol forming substance carried by the heating element prior to use; and

c) puff actuated control means for permitting current flow through the heating element during draw by the user.

15. The article of Claim 14, further including means for regulating current flow through the heating element during draw.

16. The flavor delivery of Claim 14 or 15, further comprising a source of electrical power.

17. The article of Claim 14 or 15, wherein the heating element comprises a porous material and the aerosol forming substance comprises a liquid impregnated within the heating element.

18. The article of Claim 14 or 15, wherein the heating element has a surface area greater than 50 m^2/g.

19. The article of Claim 14, wherein the aerosol forming substance includes a drug or flavor substance.

20. The article of Claim 15, wherein the means for regulating current flow during draw comprises a timer.

21. The article of Claim 15, wherein the means for regulating current flow during draw includes means for controlling the average current flow through the heating element during a portion of the draw.

22. An aerosol delivery article containing a drug or substance for use with a source of electrical power comprising:

a) an electrical resistance heating element;

b) aerosol forming substance;

c) switch means for actuating and deactuating current flow through the heating element; and

d) time based means for (i) permitting unrestricted current flow through the heating element for an initial predetermined time period upon current actuation, and (ii) for subsequently regulating current flow until current deactuation.

23. The article of Claim 22, wherein the aerosol forming substance is carried by the heating element prior to use.

24. The article of Claim 23, wherein the heating element has a surface area greater than 1 m^2/g.

25. The article of Claim 22, further comprising a source of electrical power.

26. The article of Claim 22, wherein the aerosol forming substance includes a drug or flavor substance.

27. An aerosol delivery article containing a drug or flavor substance for use with a source of electrical power comprising:

a) an air passageway at least partially through the article;

b) an air permeable electrical resistance heating element located in the air passageway;

c) an aerosol forming substance;

d) puff actuated control means for permitting current flow through the heating element during draw by the user; and

e) a mouth end.

28. The article of Claim 27, wherein the aerosol forming substance is carried by the heating ele-

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ment.

29. The flavor delivery article of Claim 27, further comprising means for regulating current flow through the heating element during draw.

30. The article of Claim 27, wherein the means for regulating current flow during draw comprises a timer.

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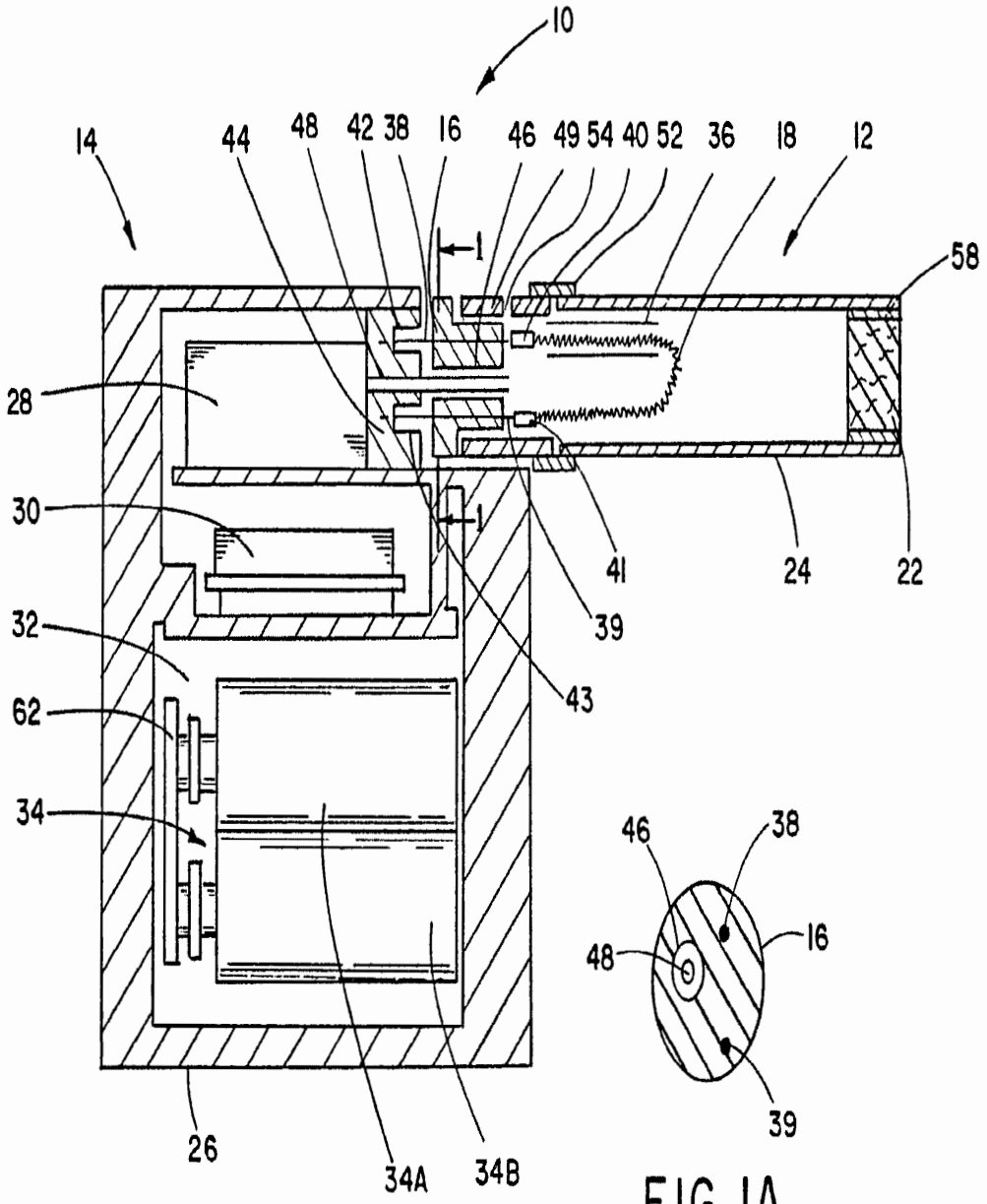


FIG. 1

FIG. 1A

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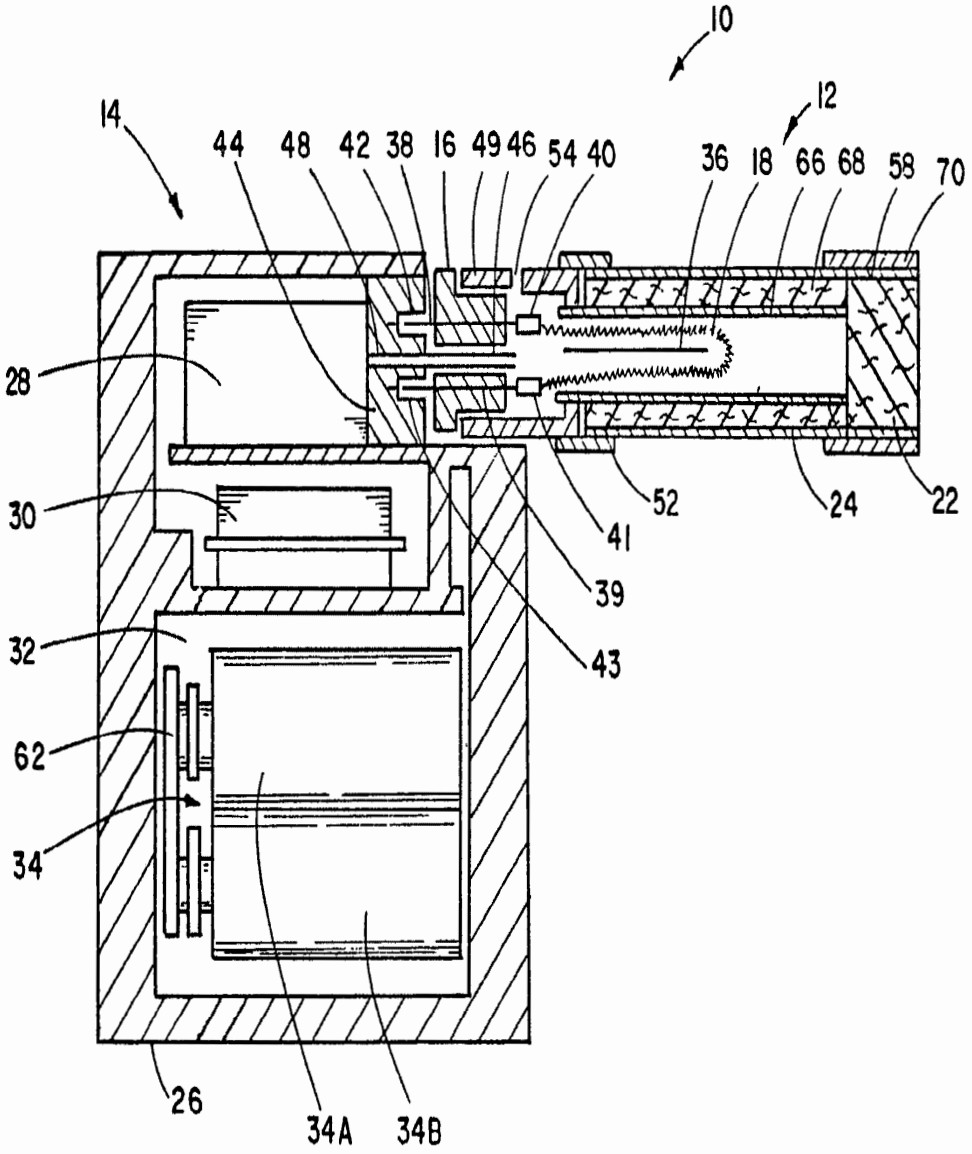


FIG. 2

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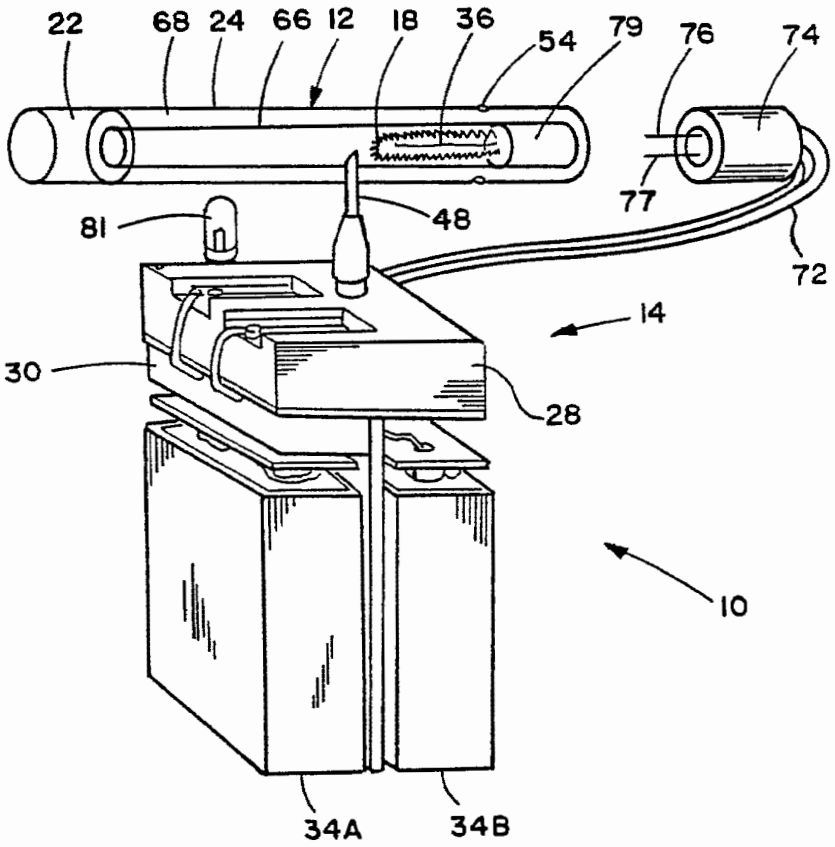


FIG. 3

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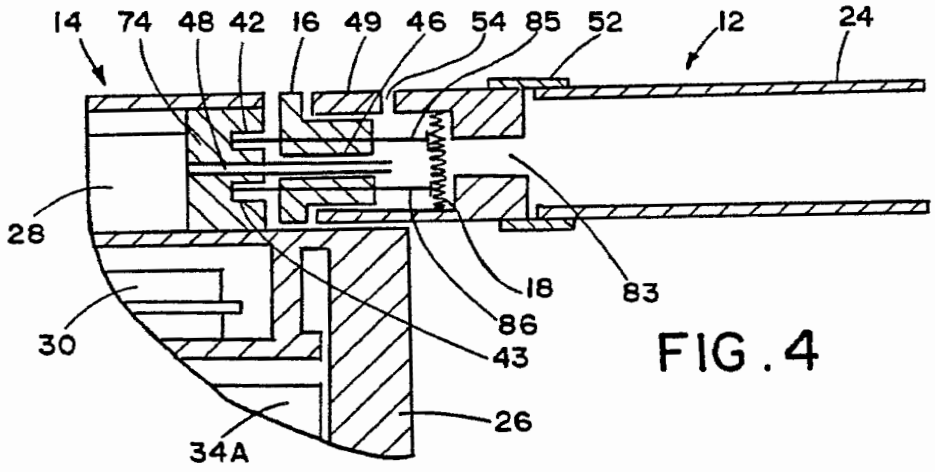


FIG. 4

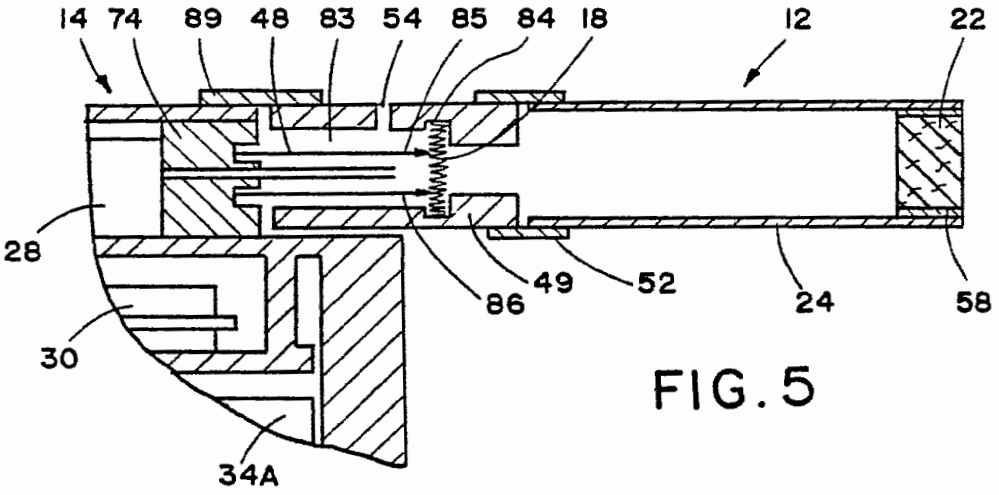


FIG. 5

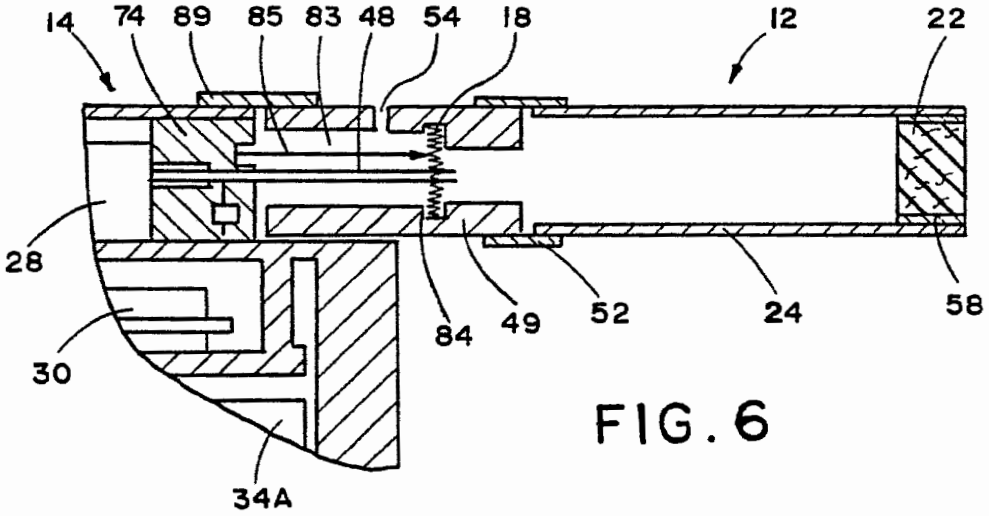


FIG. 6

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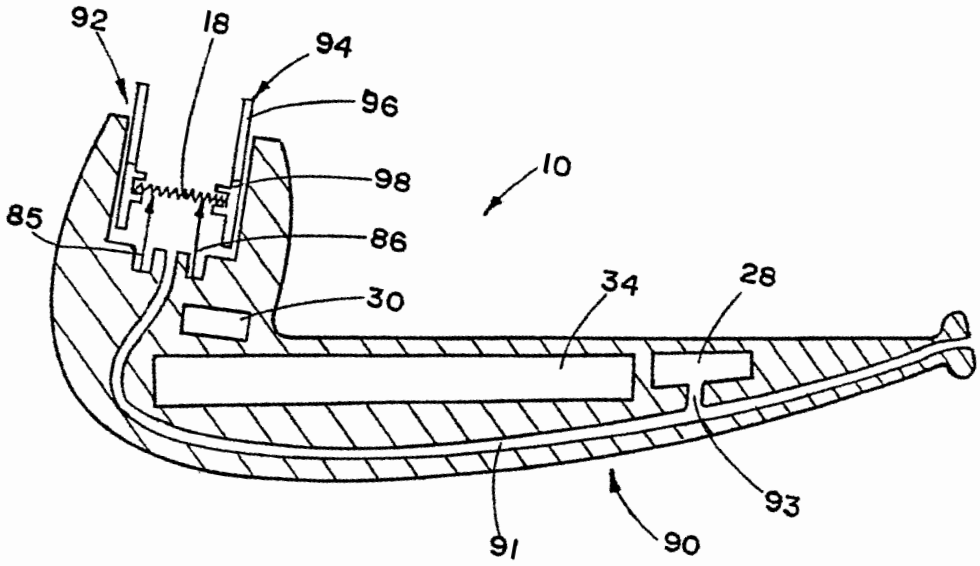


FIG. 7

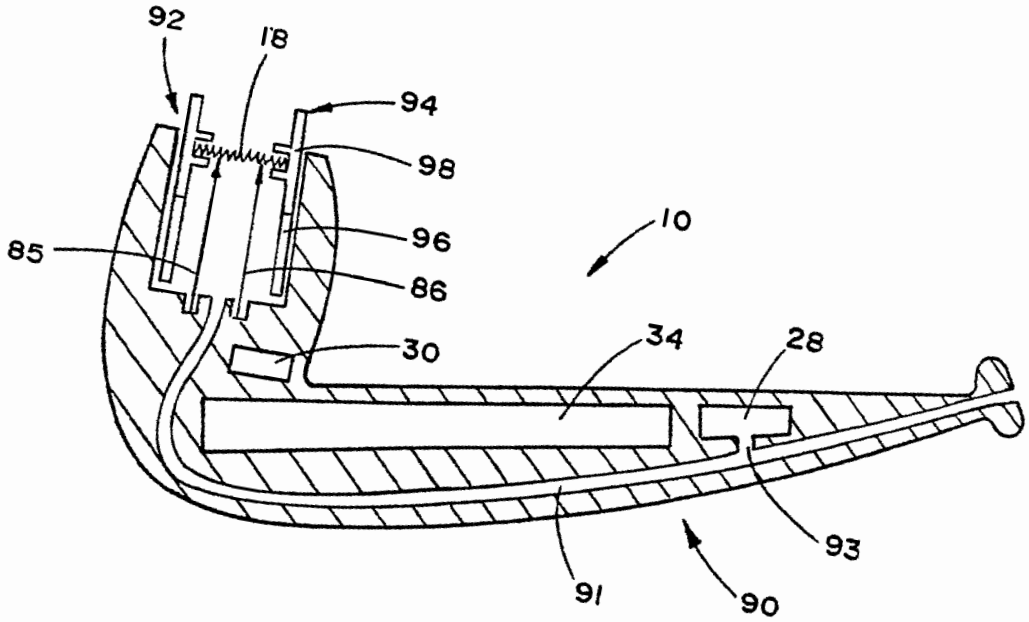


FIG. 8

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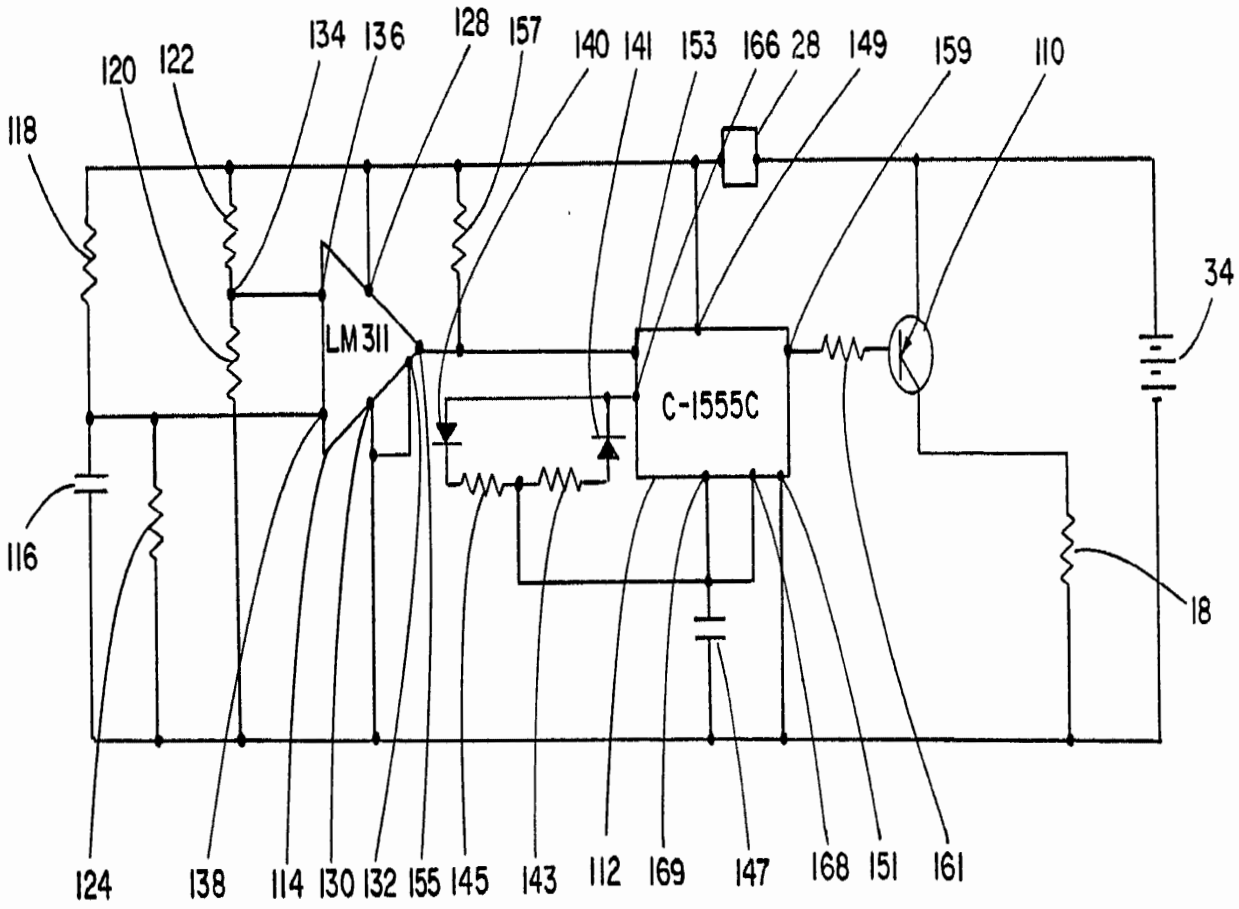


FIG. 9

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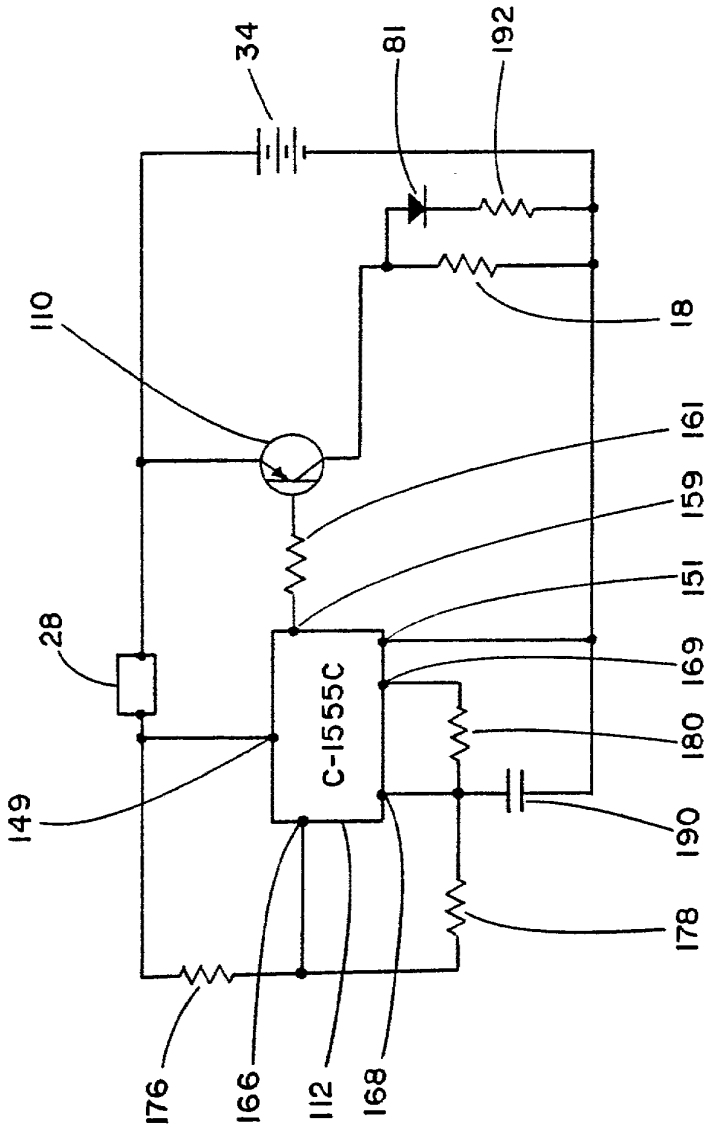
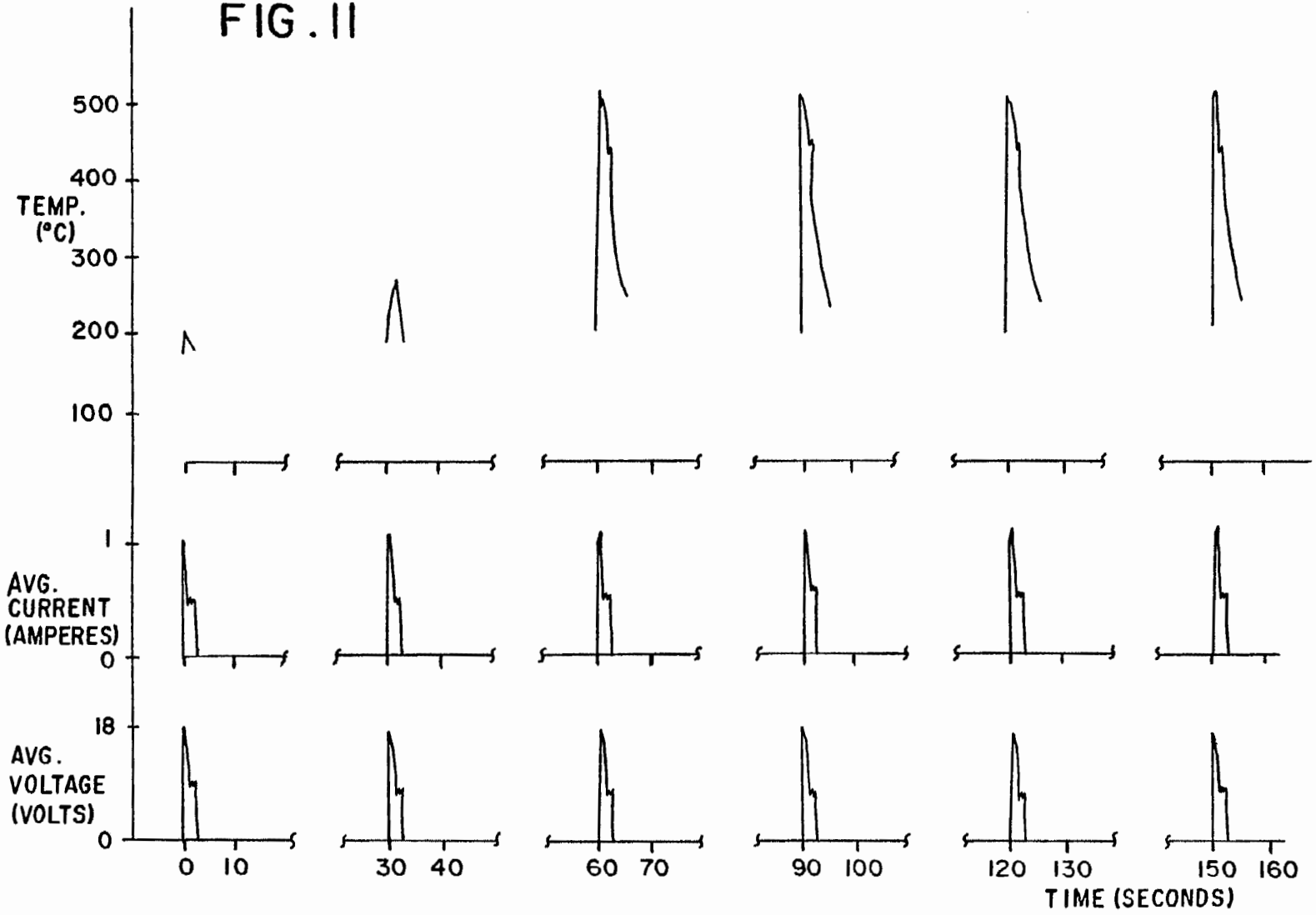


FIG. 10

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FIG. 11



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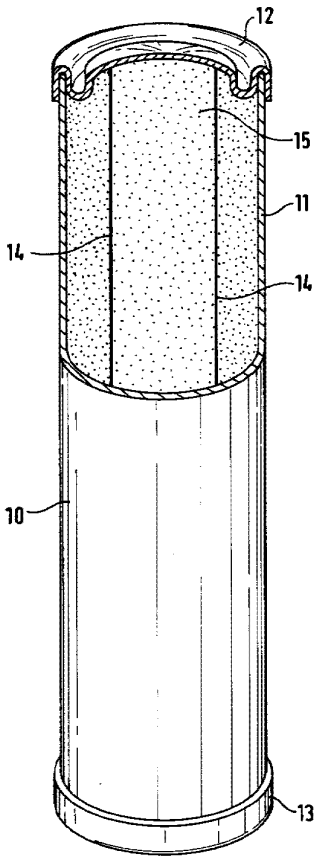
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(54) A plastic storage and transportation container for loose cartridges.

(57) A plastic storage and transportation container (10) for loose cartridges, in which container the static electricity arising inside the container (10) may be conducted outside the container by means of a conductive fiber material disposed on the inner surface. The shell of the container (10) is comprised of a thermoplastic tube structure (11). The conductive fiber material is comprised of carbon fibers (14) fixed to the inner surface of the tube structure (11) in connection with its preparation. The cover (12) and/or the bottom portion (13) of the container (10) is formed by a plug part made of a conductive plastic.



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The invention relates to a storage and transportation container for loose cartridges, the shell portion of which container is comprised of a plastic material.

Loose cartridges are typically powder cartridges packed in cotton-cloth bags. Wooden or cardboard packages have usually been used for such cartridges. A problem related to such packages is a relatively low strength and a poor ability to remain dry in connection with a long-term storage. Attempts have been made to improve the moisture-resistance properties e.g. by means of plastic coatings, but plastic coatings cause the occurrence of static electricity and its charging in the container, which causes a risk of explosion.

Loose-cartridge containers are also known, in which the case is made of thermoplastic by means of bottle, blow or rotation moulding methods. However, these methods cannot provide sufficiently rigid-walled tube structures, and it has not been possible to prevent the charging of static electricity in applications concerned.

Loose-cartridge containers are also known, in which attempts have been made to solve the problems caused by static electricity. One such application is described in the GB application 2 101 559, wherein the container is comprised of fabrics or cloths containing plastic. In accordance with this publication, the charging of static electricity is prevented by placing conductive wires in the cloth fabric. These wires are connected to a suitable conductive member, e.g. a carrier handle, located outside the container, via which member the electric charges may be discharged. However, the container according to the GB publication cannot provide a sufficient strength, and furthermore, the static-electricity discharging system described is cumbersome and expensive to realize.

The GB patent publication 1 277 550 also describes such a container, in which the case portion is comprised of a case made of glass-fiber reinforced polyester resin. This container is mainly intended for hydrocarbon fluids, but it is also suitable for fine-grained solid material. In this publication, static electricity is collected in a metal wire structure embedded in the inner surface of the container, which structure conducts static electricity to an earthing point located outside the container.

This patent publication mainly relates to the preparation of the material to be used for the preparation of the container. The actual container is formed of this material by cutting suitable parts and by fixing and seaming the parts together. The preparation method is thus cumbersome and expensive.

The present invention relates to a storage and transportation container for loose cartridges, which container is by construction strong and formally rigid and in which the members needed for the nonconductibility of static electricity are formed simultaneously in connection with the preparation of the case portion.

For achieving these objects, the inventive plastic storage and transportation container for loose cartridges, in which container the static electricity arising inside the container may be conducted outside the container by means of a conductive fiber material disposed on the inner surface, is characterized in that the shell of the container is comprised of a thermoplastic tube structure, that the conductive fiber material is comprised of carbon fibers fixed to the inner surface of the tube structure in connection with its preparation and that the cover and/or the bottom portion of the container is formed by a plug part made of a conductive plastic.

It is essential in the inventive container that the conductive carbon-fiber wires may be placed in position in connection with the preparation of the tube. The tube may be prepared by means of various methods, such as by extrusion, pultrusion, winding, wrapping and manual lamination. In the extrusion and pultrusion methods, a matrix plastic containing glass fibers is led into an extrusion or pultrusion nozzle and continuous carbon fiber wires are simultaneously led into the nozzle such that the carbon-fiber wires remain innermost and are thus located on the inner surface of the tube forming in the nozzle. In connection with the winding, wrapping and manual lamination, the carbon fibers are positioned directly on top of a mandrel or a blank to be used in the forming of the tube, whereby the carbon fibers remain on the inner surface of the tube to be produced.

The case portion of the inventive container is especially preferably formed continuously by means of extrusion, pultrusion, winding or wrapping methods, whereby the conductive tube structure forms automatically during a single work phase.

The case portion is comprised of a tube structure made of cold-set plastic or thermoplastic and strengthened with reinforcement fibers. Cold-set plastics, such as polyester resin, are preferably used, which plastics are reinforced with any suitable fiber reinforcement in a suitable form. Suitable reinforcement fibers are fiber glass reinforcements used conventionally.

The quantity of the carbon fibers and their location on the inner surface of the tube may vary. In certain cases, even one carbon-fiber wire maybe sufficient, but several wires are preferably placed in position, e.g. 2-20 pcs. No actual upper limit for the quantity of the wires exists. The carbon-fiber wires preferably pass in the direction of the longitudinal axis of the tube, but the wires may be placed to pass also circularly, which is especially suitable

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e.g. in case the tube is prepared by means of winding, wrapping or manual-lamination methods. It is essential that the carbon-fiber wires continue uniformly from one end to another of the tube.

The cover and bottom portion is prepared from a conductive plastic. For this purpose, e.g. internally conductive plastics may be used, such as polyacetylene or polythiophene, which have been made conductive by doping. The conductivity may also be achieved by blending with a plastic raw material a conductive material, such as carbon black, metal powder, metal fibers or carbon fibers.

When so desired, the conductivity of the inner surface of the tube may further be improved by painting the inner surface of the tube with a conductive paint, such as an aluminium floc paint.

The inventive storage and transportation container for loose cartridges is next described with reference to the figure of the accompanying drawing, which shows the transportation container in a partially sectional view.

In the figure, the transportation container is generally marked with a reference 10. The container is by cross-section comprised of a circular or polygonal tube 11 as well as of a detachable cover portion 12 and a bottom portion 13. The bottom portion 13 may be either detachable or fixed. For conducting static electricity, the inner surface of the tube 11 is provided with one or more longitudinal carbon fibers (14), which divide the charging fields smaller and conduct the charges outside the case 11 to the cover portion 12 and/or to the bottom portion 13. The cover portion 12 makes the nonconductivity of the electric charge possible such that it is comprised of a conductive plastic. Thus, no separate earthing elements are needed.

When so desired, the inner surface of the tube 11 may be painted or coated with a conductive paint or layer 15.

A plastic storage and transportation container (10) for loose cartridges, in which container the static electricity arising inside the container (10) may be conducted outside the container by means of a conductive fiber material disposed on the inner surface. The shell of the container (10) is comprised of a thermoplastic tube structure (11). The conductive fiber material is comprised of carbon fibers (14) fixed to the inner surface of the tube structure (11) in connection with its preparation. The cover (12) and/or the bottom portion (13) of the container (10) is formed by a plug part made of a conductive plastic.

Claims

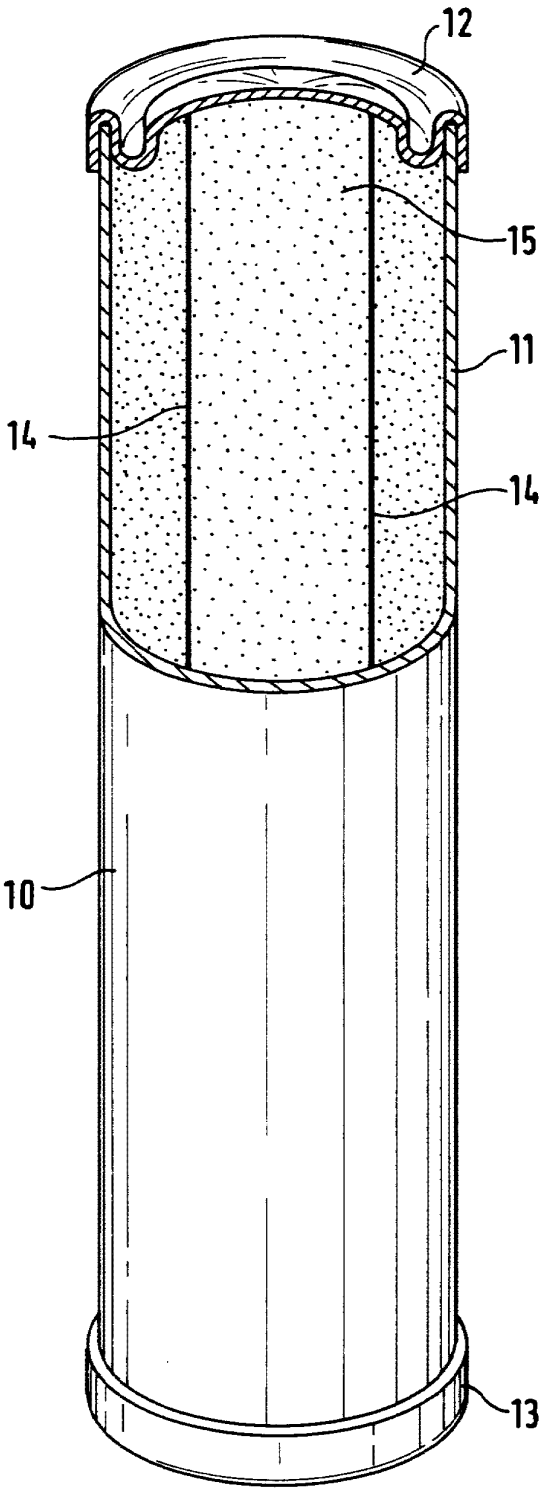
1. A plastic storage and transportation container (10) for loose cartridges, in which container the static electricity arising inside the container (10) may be conducted outside the container by means of a conductive fiber material disposed on the inner surface, **characterized** in that the shell of the container (10) is comprised of a thermoplastic tube structure (11), that the conductive fiber material is comprised of carbon fibers (14) fixed to the inner surface of the tube structure (11) in connection with its preparation and that a cover (12) and/or a bottom portion (13) of the container (10) is formed by a plug part made of a conductive plastic.

2. A container according to Claim 1, **characterized** in that the shell portion is comprised of a reinforced-plastic cold-set or thermoplastic reinforced with glass fibers.

3. A container according to Claim 1 or 2, **characterized** in that the carbon fibers (14) extend continuously from one end to another of the tube structure (11).

4. A container according to any of the preceding Claims, **characterized** in that the plug parts are comprised of plastic, which is in itself conductive or which at least on the part of the surface layer is made conductive.

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European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 92 10 3177

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
D,A	GB-A-2 101 559 (HUMBER FABRICS) * the whole document * ---	1	H05F3/02 F42B39/14
A	US-A-4 540 624 (CANNADY) * abstract * -----	1	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

H05F
B29C
F42B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
BERLIN	04 JUNE 1992	SMITH C.A.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P0401)

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(19) Japan Patent Office (JP)

(12) **Japanese Unexamined Patent Application Publication (A)**

(11) Japanese Unexamined Patent Application Publication Number

H9-326299

(43) Publication date: December 16, 1997

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H05B	37/02			H05B	37/02	L
A47G	33/00			A47G	33/00	D
F21S	1/12			F21S	1/12	E

Request for examination: Not yet requested Number of claims: 13 Written (Total of 7 pages)

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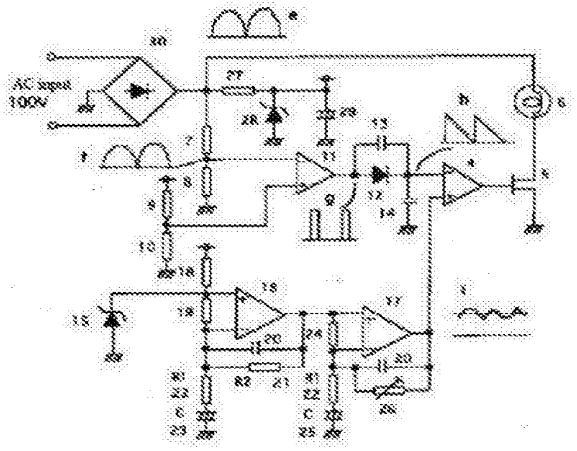
(72) Inventor: Ikuo KURASHIMA
6-12-25 Ochiai, Tama-shi, Tokyo-to

(54) (TITLE OF THE INVENTION) Light source driver and fluctuation signal generator

(57) (ABSTRACT)

(PROBLEM) Implement a light source driver wherein the flame of a candle is simulated by an incandescent light bulb, rendering it possible to artificially obtain illumination that gives the impression of a candle being lit by means of an incandescent light bulb, and a fluctuation signal generator for the same.

(MEANS FOR SOLVING) Light source driver that drives a light source 6, which light source driver is furnished with a noise source 1 that generates random noise and a drive circuit 5 that drives the light source based on a signal output by the noise source, wherein noise source 1 alters the noise generated based on temperature change, and noise source 1 is positioned in such a way as to be affected by wind from the exterior.



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(SCOPE OF PATENT CLAIMS)

(CLAIM 1) For a light source driver that drives a light source,

Which light source driver is furnished with a noise source that generates random noise and

A drive circuit that drives the light source based on a signal output by the noise source,

A light source driver characterized in that the aforesaid noise source alters the noise generated based on temperature change and

The aforesaid noise source is positioned in such a way as to be affected by wind from the exterior.

(CLAIM 2) The light source driver set forth in Claim 1, wherein said light source driver is a light source driver that is housed in a case having holes, and the aforesaid noise source is positioned in such a way as to receive wind from the aforesaid holes.

(CLAIM 3) The light source driver set forth in Claim 1, wherein said light source driver is a light source driver that is housed in a case, and a part of the aforesaid noise source is exposed to the exterior of the aforesaid case.

(CLAIM 4) The light source driver set forth in any one of Claims 1 through 3,

Furnished with a comparison circuit that compares the output of the aforesaid noise source with a designated reference signal and generates a pulse signal based on the comparison results,

Wherein said drive circuit drives the aforesaid light source based on the pulse signal output by the aforesaid comparison circuit.

(CLAIM 5) The light source driver set forth in Claim 4, wherein the aforesaid reference signal is a signal that is periodically altered to have a frequency higher than the frequency range of the signal output by the aforesaid noise source, and that has an amplitude greater than the alteration range of the signal output by the aforesaid noise source.

(CLAIM 6) For a light source driver that drives a light source,

Which light source driver is furnished with a noise source that generates random noise and

A drive circuit that drives the light source based on a signal output by said noise source,

A light source driver that is furnished with a comparison circuit that performs comparison with the reference signal that is periodically altered to have a frequency higher than the frequency range of the signal output by the aforesaid noise source, and that has an amplitude greater than the alteration range of the signal output by the aforesaid noise source, and generates a pulse signal based on the comparison results,

Wherein the aforesaid drive circuit drives the aforesaid light source based on the pulse signal output by the aforesaid comparison circuit.

(CLAIM 7) Light source driver set forth in any one of Claims 1 through 6,

Being a light source driver wherein the aforesaid noise source is furnished with a Zener diode, a power circuit that supplies current to said Zener diode, and an amplification circuit that amplifies the generated Zener voltage, wherein the output of said amplification circuit is output as noise.

(CLAIM 8) Light source driver set forth in any one of Claims 1 through 6,

Being a light source driver wherein the aforesaid noise source is furnished with a thermistor, a power circuit that supplies current to said thermistor, and an amplification circuit that amplifies the voltage generated on the terminal of the aforesaid thermistor, wherein the output of said amplification circuit is output as noise.

(CLAIM 9) Light source driver set forth in Claim 7 or 8, being a light source driver that is further furnished with a gain adjustment means that adjusts the gain of the aforesaid amplification circuit.

(CLAIM 10) Light source driver set forth in any one of Claims 1 through 9,

Being a light source driver that is furnished with a filter circuit that eliminates signals generated by the aforesaid noise source that have a frequency above a designated frequency and below a designated frequency.

(CLAIM 11) Light source driver set forth in Claim 10,

Being a light source driver wherein the aforesaid filter circuit is a band-pass filter that permits passage of signals within a frequency range of 0.1 Hz to 10 Hz.

(CLAIM 12) Fluctuation signal generator, being a fluctuation signal generator characterized in that it is furnished with a 1/f fluctuation signal generator that generates a 1/f fluctuation signal, where f is frequency, and a filter circuit that eliminates signals generated by said 1/f fluctuation signal generator that have a frequency above a designated frequency and below a designated frequency.

(CLAIM 13) Fluctuation signal generator set forth in Claim 12, being a fluctuation signal generator wherein the aforesaid filter circuit is a band-pass filter that permits passage of signals within a frequency range of 0.1 Hz to 10 Hz.

(DETAILED DESCRIPTION OF THE INVENTION)

(0001)

(TECHNICAL FIELD OF THE INVENTION) This invention relates to a light source driver that simulates the natural pattern of light and dark generated by a candle by means of a light source such as an incandescent light bulb, LED, or the like, and to a fluctuation signal generator that serves to implement driving of this kind.

(0002)

(PRIOR ART) Electrical lighting implements such as incandescent light bulbs, LEDs and the like have been used to simulate the flame of a candle and achieve illumination that appears the same as if one were using a candle. For example, Japanese Unexamined Patent Application Publication H6-52709 discloses a method of irregularly turning illumination on and off by using a light bulb simulating the shape of a candle's flame, attaching the light bulb unit to a piece of metal positioned close to an electromagnet connected to an oscillator, and mechanically oscillating the light bulb unit. However, this method merely mechanically oscillates the light bulb, and altering mains power or the signal from an oscillator in order to achieve irregularity does nothing to alter the brightness of the illumination, which leaves a feeling of artificiality in comparison with the illumination of a candle. Furthermore, another method is to oscillate the filament of the light bulb in accordance with illumination, but this also results in unnatural illumination that differs in substance from the pattern of light and dark produced by a candle.

(0003) In contrast, Japanese Unexamined Patent Application Publication H2-44693 discloses a method of altering the intensity of an illumination implement according to so-called 1/f fluctuation as a means of obtaining more pleasant illumination. The method disclosed here is a method of obtaining more pleasant illumination for humans, and not a method of simulating the flame of a candle by means of an incandescent light bulb, so it is not able to achieve the same illumination as when using a candle.

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Furthermore, Japanese Unexamined Patent Application Publication H2-44693 discloses a method for using minute fluctuations in voltage at both terminals of the resistor as a method of generating a fluctuation signal, and a method for storing a numerical string having 1/f fluctuation in advance in ROM and reading this out to generate a fluctuation signal.

(0004) Furthermore, Japanese Unexamined Patent Application Publication H7-14680 discloses a device wherein the drive signal is partitioned, and each signal is first delayed separately before being composited for illumination as a way of addressing the fact that illumination does not occur in accordance with 1/f fluctuation due to the time delay from the point in time when an incandescent light bulb is turned on or off to the point in time when the light actually illuminates or is extinguished. However, because even this device is not a device that simulates the flame of a candle by means of an incandescent light bulb, it is also not capable of producing the same feeling in the illumination as when using a candle.

(0005)

(PROBLEM TO BE SOLVED BY THE INVENTION) As explained above, there is no method or device that simulates a candle by means of an electrical light source such as an incandescent light bulb, LED, or the like in the above-described prior-art examples. Accordingly, no mention whatsoever is made of the style of illumination unique to a candle whereby the light fluctuates in accordance with the wind, and no disclosure whatsoever is made regarding a light source driver or drive method for achieving such a style of illumination.

(0006) In order to achieve the style of illumination of a candle by simulating a candle with an electrical light source, it is necessary to simulate the natural style of illumination of a candle, whereby it darkens and conversely brightens as the wind blows, but prior to now it was not possible to simulate this style of illumination unique to the flame of a candle.

(0007) This invention has as its objective to implement a light source driver that is able to artificially produce illumination that gives the impression of a candle being lit with an electrical light source by simulating the flame of a candle with an electrical light source, and to a fluctuation signal generator for this purpose.

(0008)

(MEANS OF SOLVING THE PROBLEM) Fig. 1 is a diagram showing the basic structure of the first form of the light source driver in this invention. In order to achieve the aforesaid objective, the light source driver in this invention, as shown in Fig. 1, is a light source driver furnished with a noise source 1 that generates random noise and a drive circuit 5 that drives a light source 6 based on the signal output from the noise source, characterized in that a noise source that alters the generated noise according to temperature change is used as noise source 1, and the noise source is positioned in such a way as to be able to incur the influence of wind from the exterior.

(0009) Examples of methods for disposing the noise source so as to be able to incur the influence of wind from the exterior include providing a hole on the case that houses the light source driver so that the noise source can receive wind through this hole, and positioning a portion of the noise source on the exterior of the case.

(0010) When simulating a candle by pulse-driving the light source and altering the pulse width thereof, a comparison circuit is provided to perform comparison with a designated reference signal that is periodically altered to have a frequency higher than the frequency range of the signal output by noise source 1, and that has an amplitude greater than the alteration range of the signal output by the aforesaid noise source, and driving of the light source is performed based on this pulse signal.

(0011) A Zener diode or thermistor, for example, is used as the noise source that alters the noise generated in accordance with temperature change, and the voltage generated when current is supplied to these is amplified for use as the noise signal. It is preferred that the type of fluctuation be rendered alterable by rendering the degree of voltage amplification alterable.

(0012) Furthermore, it is also preferred that signals generated by the noise source with a frequency above a designated frequency and below a designated frequency, for example signals beyond the frequency range of 0.1 Hz to 10 Hz, be eliminated.

(0013) Furthermore, the fluctuation signal generator in this invention is also furnished with a 1/f fluctuation signal source that generates a 1/f fluctuation signal, where f is frequency, and a filter circuit that eliminates signals generated by the 1/f fluctuation signal source having a frequency above a designated frequency and below a designated frequency, for example signals beyond the frequency range of 0.1 Hz to 10 Hz.

(0014) When current is supplied to the resistor, Zener diode, thermistor, or the like, the voltage generated in the terminals thereof changes randomly and minutely, and Japanese Unexamined Patent Application Publication H2-44693 discloses that this noise has a 1/f spectrum, where f is frequency. Accordingly, amplifying this noise with a large gain can be suspected to generate a random noise signal with a 1/f spectrum. Furthermore, when current is supplied to the resistor, Zener diode, thermistor, or the like, the voltage generated in the terminals thereof is known to change according to temperature change. For this reason, even a minute change in temperature caused by a change in the wind hitting the surface will cause a substantial change in noise. Hence, when a fluctuation signal is generated by amplifying the noise generated in the terminals of a resistor, Zener diode, thermistor, or the like, and a light source is driven by this fluctuation signal, it is possible to simulate flickering in the wind by positioning the noise source, i.e. the resistor, Zener diode, thermistor, or the like, in such a way that it will incur the influence of the wind and thereby change in temperature.

(0015) Zener diodes and thermistors are ideally suited for use for this purpose, as their rate of change in voltage according to temperature change is greater than that of resistors, etc. For example, the rate of change of a 9 V Zener diode is on the order of several mV/°C, and flow is reversed at the Zener voltage. Hence, amplifying the Zener voltage produces a fluctuation signal similar to 1/f, but change in temperature adds a component that changes substantially. If a Zener diode is positioned in a location affected by the wind or the like, then in the event of a minute but momentary change in the temperature thereof due to the influence of the wind or the like, the fluctuation in the Zener voltage will also increase in accordance therewith.

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Accordingly, fluctuation in Zener voltage will increase in accordance with wind or the like, making it possible to achieve a mode of illumination that resembles the flickering of a candle in the wind. Fluctuation occurs in the same way even if the direction of flow is reversed as described above.

(0016) When altering the mode of illumination of a light source, it is easier to drive this alteration with pulse signal and render the pulse width thereof alterable than to alter the drive current or drive voltage. Hence, a signal (PWM signal) that alters the pulse width could conceivably be generated according to a noise signal output from a noise source. The level of the noise signal would change as the temperature of the noise source gradually changes. For this reason, it is conceivable that generating a pulse signal by simply comparing noise to a signal with a fixed level could result in long periods of very bright illumination followed by long periods of nearly dark illumination. This mode of illumination is not desirable for simulating a candle. In particular, remaining off for a long period of time may suggest to the user that a breakdown has occurred. Hence, by periodically changing to a frequency higher than the frequency range of the signal output by the noise source, and generating a pulse signal by comparison with a designated reference signal of an amplitude greater than the alteration range of the signal output by the aforesaid noise source, it is possible to achieve illumination that does not typically fluctuate substantially, but changes substantially when the wind blows thereupon or the like.

(0017) Additionally, in the event that atmospheric changes result in a change in the overall ambient temperature around the device, the level of the Zener voltage will change substantially, so eliminating the direct current component is preferred. Furthermore, since changes faster than a certain speed cannot be perceived by humans, not only are such changes unnecessary in order to simulate a candle, but their frequency component should be eliminated. Furthermore, although the low frequency component produces slow changes, humans have difficulty perceiving such changes, and hence these are not only unnecessary in terms of simulating the flame of a candle, but bring about variation in the average level of the fluctuation signal, substantially altering the brightness level, which is a serious issue. For this reason, it is preferred that the frequency component below a certain level, for example the frequency component up to 0.1 Hz, be eliminated. The same can be said for not only driving a light source for illumination but also for any fluctuation signal that is intended to impart a natural impression to humans.

(0018)

(EMBODIMENTS OF THE INVENTION) Fig. 2 is a diagram showing the basic structure of an embodiment example of a lighting device using the light source driver in this invention, and Fig. 3 is a diagram illustrating the principle by which a pulse signal is generated in the comparison circuit thereof.

(0019) The lighting device in Fig. 2 performs on/off control of the current flowing to lamp 6 using the switch of FET 5, an incandescent light bulb, altering the brightness of lamp 6 by altering the rate of the time that FET 5 is on (duty rate). Noise source 1 generates a microscopic noise signal of anywhere from several μV to several mV. Band-pass filter/gain control amplifier 2 has an amplification function for high-gain amplification of the microscopic noise signal generated by noise source 1, and a band-pass filter function that only permits signals within a designated frequency range to pass and attenuates signals beyond this frequency range. The gain of amplification can be adjusted. Reference signal generation circuit 3 periodically changes to a frequency higher than the frequency range of the signal output by band-pass filter/gain control amplifier 2, and generates a reference signal with an amplitude greater than the alteration range of the signal output by the band-pass filter/gain control amplifier 2. A sawtooth signal or triangle wave signal is preferred for the reference signal, but a sine-wave signal or the like is acceptable. Comparator 4 generates a pulse signal by comparing the noise output by the band-pass filter/gain control amplifier 2 with the reference signal output by the reference signal generation circuit 3. The generation of a pulse signal will be described referencing Fig. 3.

(0020) As shown in Fig. 3, noise of the kind shown in the drawing is output from band-pass filter/gain control amplifier 2, and a triangle wave is output as the reference signal. The reference signal is a signal that periodically changes to a frequency higher than the frequency range of the noise signal output by the band-pass filter/gain control amplifier 2 and has an amplitude greater than the alteration range of the noise signal. Furthermore, the average level of the noise signal output by the band-pass filter/gain control amplifier 2 is set to attain the middle level of the triangle. For this reason, a signal of the kind shown in the drawing is input to comparator 4. Comparator 4 compares the two input signals and generates a "high" pulse when the reference signal is greater than the noise signal and a "low" pulse when the reference signal is smaller than the noise signal. Because the noise signal changes randomly, the pulse width of the generated pulse signal changes, causing the brightness of lamp 6 to change.

(0021) Fig. 4 is a diagram showing the circuit configuration of the first embodiment example of the light source driver in this invention. The first embodiment example of the light source driver is an example wherein an incandescent light bulb is used as the light source and mains power of AC100V or the like is used as the power source.

(0022) In order to generate a sawtooth wave that is triangular, since the peak voltage of C is high at roughly 141 V, resistors 7, 8 are connected in series in order to obtain an input voltage that can be used by a normal op-amp, producing a waveform f with a low voltage of on the order of 14 to 15 V, which is connected to the negative input of comparator 11. In contrast, resistors 9, 10 are used to obtain threshold voltage at the positive input of comparator 11. For example, using on the order of 13 V for the peak of negative input sets positive input to DC2.5 V. By this means, the output of comparator 11 generates a rectangular waveform g. To then change this to a sawtooth wave, the sawtooth waveform indicated by waveform h can be generated by diode 12 and capacitor 14. The capacitor 13 connected in parallel with diode 12 is used to hasten rising of the sawtooth wave. In contrast, occurrence and generation of noise is achieved by connecting Zener diode 15 as positive input across resistors 18, 19, which serve to obtain op-amp 16 Zener drive current.

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Op-amp 16 is a high-gain amplifier with a band-pass filter function that amplifies only the microscopic alternating current noise component of the Zener diode that is the noise source. Gain is the ratio of resistor 22 to resistor 21, expressed as R1 and R2, or G=1+(R2/R1). Furthermore, a capacitor 23 is positioned as a low-pass filter connected in series with resistor 22, and functions as a high-pass filter.

(0023) For example, assuming 0.1 HZ as the cutoff frequency, using R1=15 KΩ and R2=2.2 MΩ, this means that C=22 μF, resulting in attenuation characteristic of 12 dB. In contrast, connecting capacitor 20 to R2 of resistor 21 results in low-pass filter functionality, so setting the cutoff frequency to near 10 HZ results in on the order of 0.22 μF. In this example, using the aforesaid formulae, gain is on the order of roughly 150 times. Furthermore, the amplifier of op-amp 17 is connected in order to increase amplification and make filter properties more sharp, and a variable resistor 26 is prepared for feedback resistance R2 in order to make it possible to adjust gain. Using a 47 μF capacitor 25 twice this is an effective means of making high-pass filter properties steeper. Two-stage amplification results in the filter having attenuation property of 18 dB, making this an effective means of imparting the impression of a candle's flame. Note that resistors 19, 24 connected to the input of the op-amp are operational. Noise-generation voltage attains amplification of on the order of 40 dB with the two-stage amplifier, which is a level comparable to a sawtooth wave. In this example, assuming that the op-amp is operated at 15 V, the peak voltage of the sawtooth wave would be roughly 15 V and the frequency would be 100 or 120 HZ, or twice the frequency of alternating current mains power. Noise voltage fluctuates around roughly 9 to 10 V, and the noise signal fluctuates between 0 V and 15 V. Accordingly, as explained for Fig. 1, connecting the sawtooth wave signal and the noise signal to op-amp 4 results in a binary output signal whose pulse width varies according to the level of the noise signal, which is connected to the gate of FET 5, and turns the lamp on/off. Resistor 27, Zener diode 28 and capacitor 29 in the drawing comprise a constant-voltage power supply that serves to provide power to the op-amp.

(0024) As explained above, in the first embodiment of the light source driver, the pulse width of the pulse signal that illuminates lamp 6 varies randomly, such that the flickering of the illumination imparts an impression similar to that of a candle. Notably, enclosing lamp 6 with semi-transparent glass or the like reinforces this candle-like impression. Furthermore, Zener diode 15 is sensitive to temperature change, and abrupt temperature changes, even if minute, cause substantial flickering. A structure that makes use of this to further amplify the impression of a candle flickering in the wind will be described.

(0025) Fig. 5 is a diagram showing the appearance and the interior of a lighting device using the first embodiment of the light source driver. As shown in Fig. 5 (1), this lighting device adopts a shape patterned after a candle, and consists of a lamp 6 attached to a white case 50. The circuit of the light source driver shown in Fig. 4 is housed in case 50. Furthermore, a hole 51 is provided in case 50 so that wind from the exterior can blow into the interior of case 50. Next, as shown in Fig. 5 (2), a printed circuit board 52 on which the circuit of the light source driver shown in Fig. 4 is formed is attached to case 50, with Zener diode 15 being installed in a location near the hole 51 provided in case 50, so that wind blows from the exterior through this hole 51 onto the surface of Zener diode 15, causing the temperature thereof to change, albeit minutely. Accordingly, when this lighting device is placed outside in the wind, or is blown on by a person, the illumination of lamp 6 alters significantly, imparting the impression of a candle. Although the circuit of the light source driver shown in Fig. 4 produces a noise signal even without wind being blown onto it, and will hence produce flickering light even when kept indoors with no wind, thereby imparting the impression of a candle, adopting a structure of the kind shown in Fig. 5 causes the illumination to change according to the influence of the wind, thereby further intensifying the impression of a candle.

(0026) Fig. 6 is a diagram showing another example of a lighting device. In this case, a member 53 made of heat-conductive material is provided extending from the surface of Zener diode 15 to the exterior, so that when the surface of the member 53 is hit by wind and changes in temperature, this is communicated to Zener diode 15.

(0027) Fig. 7 is a diagram showing the circuit structure of a second embodiment of the light source driver, wherein a battery 34 is used in place of a mains alternating power supply and an LED 33 is used in place of an incandescent light bulb. Oscillator 31 is provided and is connected to the negative input of op-amp 11, rendering it possible to obtain a sawtooth wave. LED 33 of a different color may be used, and miniaturization is possible. Compact fairy lights may be used in place of LEDs.

(0028)

(EFFECT OF THE INVENTION) As described above, according to this invention, it is possible to implement a light source driver that imparts an impression even closer to that of a candle with an electrical lighting implement.

(BRIEF DESCRIPTION OF THE DRAWINGS)

(FIG. 1) Diagram showing the basic structure of the first form of the light source driver in this invention.

(FIG. 2) Diagram showing the basic structure of an embodiment of a lighting device using the light source driver in this invention.

(FIG. 3) Diagram illustrating the occurrence of a pulse signal for driving in the light source driver in this invention.

(FIG. 4) Circuit drawing showing the structure of the first embodiment example of the light source driver in this invention.

(FIG. 5) Diagram showing the appearance and internal structure of a lighting device using a light source driver with the form of that in the first embodiment example.

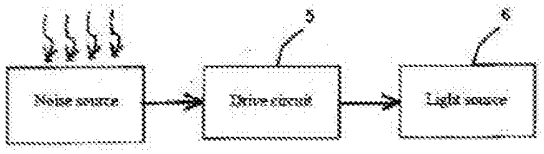
(FIG. 6) Diagram showing an example of the appearance and internal structure of a lighting device utilizing the first embodiment example of the light source driver.

(FIG. 7) Circuit drawing showing the structure of the second embodiment example of the light source driver in this invention.

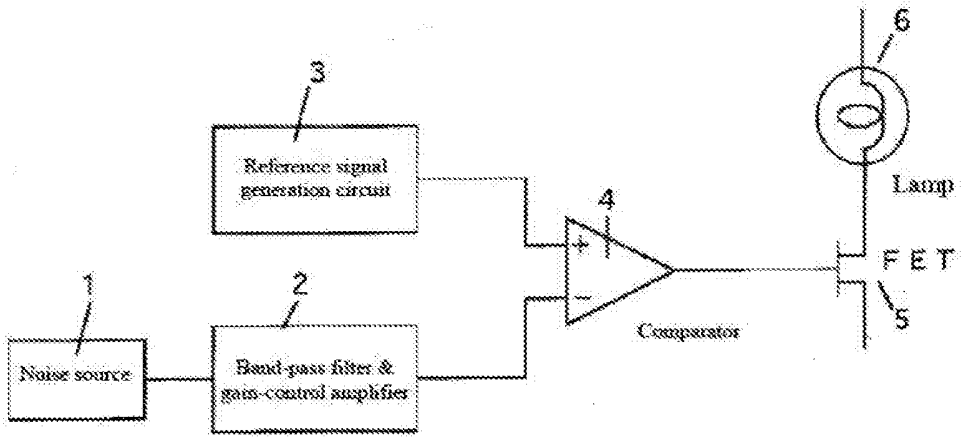
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(DESCRIPTION OF THE REFERENCES)
1. Noise source
2. Band-pass filter/gain control amplifier
3. Reference signal generation circuit
4. Comparator
5. Drive circuit
6. Light source (lamp)
7. Resistor
8. Resistor
9. Resistor
10. Resistor
11. Comparator
12. Diode
13. Speed-up capacitor
14. Capacitor
15. Zener diode for noise generation
16. Amplifier with band-pass filter
17. Amplifier with band-pass filter
18. Resistor
19. Resistor
20. Capacitor
21. Resistor
22. Resistor
23. Capacitor
24. Resistor
25. Capacitor
26. Trimmer resistor for gain adjustment
27. Resistor
28. Zener diode
29. Capacitor
30. Bridge diode
31. Oscillator
32. Resistor
33. LED
34. Battery
50. Case
51. Hole
52. Printed circuit board
53. Member
a. Full-wave-rectified waveform
d. Diagram showing output of comparator
e. Diagram showing voltage waveform after bridge rectification
f. Diagram showing comparator input waveform after bridge rectification
g. Diagram showing output pulse of comparator
h. Diagram showing generated sawtooth waveform
i. Diagram showing noise after amplification

(FIG. 1)

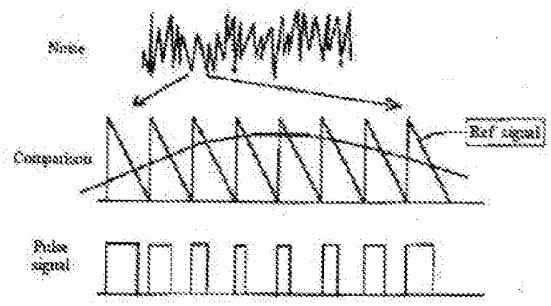


(FIG. 2)

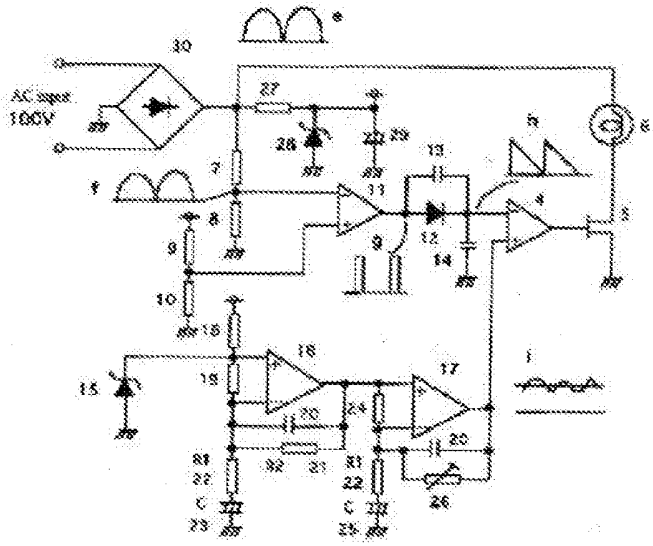


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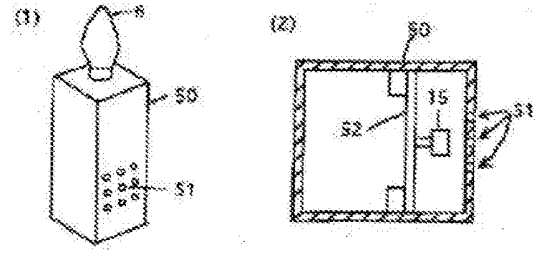
(FIG. 3)



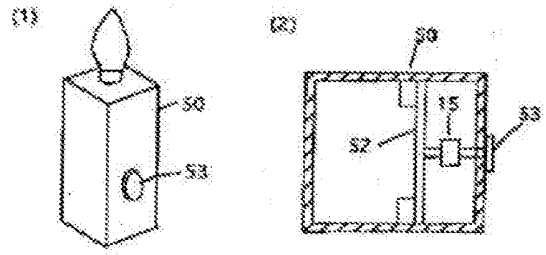
(FIG. 4)



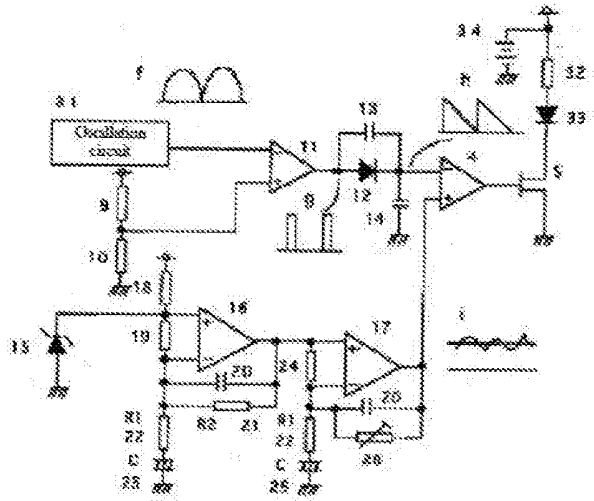
(FIG. 5)



(FIG. 6)



(FIG. 7)



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TRANSPERFECT

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I, Angela Lo, hereby certify that the document "JP9-326299(A)" is, to the best of my knowledge and belief, a true and accurate translation from Japanese to English.

Angela Lo

Sworn to before me this
June 14, 2016

Signature, Notary Public

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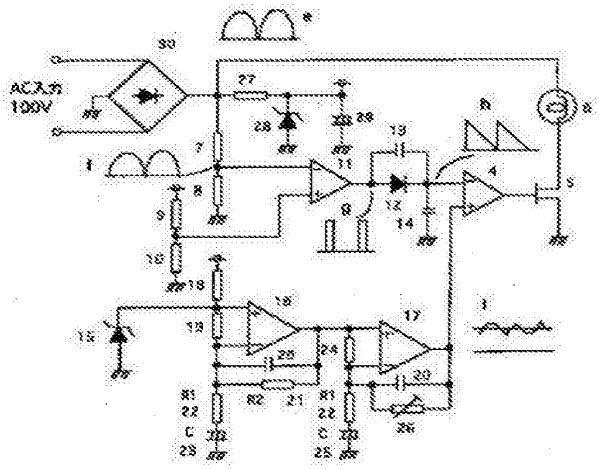
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(54)【発明の名称】　光源駆動装置及びゆらぎ信号発生装置

(57)【要約】

【課題】白熱電球でろうそくの炎を模擬し，白熱電球であたかもろうそくが点灯されているが如き発光を人工的に得ることができる光源駆動装置及びそのためのゆらぎ信号発生装置の実現。

【解決手段】光源６を駆動する光源駆動装置であって，ランダムな雑音を発生する雑音発生源１と，雑音発生源の出力信号に基づいて光源を駆動する駆動回路５とを備える光源駆動装置において，雑音発生源１は，温度変化に応じて発生する雑音を変化させるものであり，雑音発生源１を外部からの風の影響を受けるように配置する。



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【特許請求の範囲】
【請求項１】　光源を駆動する光源駆動装置であって、
ランダムな雑音を発生する雑音発生源と、
該雑音発生源の出力信号に基づいて前記光源を駆動する駆動回路とを備える光源駆動装置において、
前記雑音発生源は、温度変化に応じて発生する雑音を変化させるものであり、
前記雑音発生源を外部からの風の影響を受けるように配置したことを特徴とする光源駆動装置。
【請求項２】請求項１に記載の光源駆動装置であって、
当該光源駆動装置は、穴を有する筐体に収容され、前記雑音発生源は前記穴からの風を受けるように配置されている光源駆動装置。
【請求項３】請求項１に記載の光源駆動装置であって、
当該光源駆動装置は、筐体に収容され、前記雑音発生源の一部は前記筐体の外部に出ている光源駆動装置。
【請求項４】請求項１から３のいづれか１項に記載の光源駆動装置であって、
前記雑音発生源の出力を所定の基準信号と比較し、比較結果に基づいてパルス信号を生成する比較回路を備え、
前記駆動回路は前記比較回路の出力するパルス信号に基づいて前記光源を駆動する光源駆動装置。
【請求項５】請求項４に記載の光源駆動装置であって、
前記基準信号は、前記雑音発生源が出力する信号の周波数範囲より高い周波数で周期的に変化し、前記雑音発生源が出力する信号の変化範囲より大きな振幅の信号である光源駆動装置。
【請求項６】光源を駆動する光源駆動装置であって、
ランダムな雑音を発生する雑音発生源と、
該雑音発生源の出力信号に基づいて前記光源を駆動する駆動回路とを備える光源駆動装置において、
前記雑音発生源が出力する信号の周波数範囲より高い周波数で周期的に変化し、前記雑音発生源が出力する信号の変化範囲より大きな振幅の所定の基準信号と比較し、比較結果に基づいてパルス信号を生成する比較回路を備え、
前記駆動回路は前記比較回路の出力するパルス信号に基づいて前記光源を駆動する光源駆動装置。
【請求項７】請求項１から６のいづれか１項に記載の光源駆動装置であって、
前記雑音発生源は、ツェナーダイオードと該ツェナーダイオードに電流を流す電源回路と発生するツェナー電圧を増幅する増幅回路とを備え，該増幅回路の出力が雑音として出力される光源駆動装置。
【請求項８】請求項１から６のいづれか１項に記載の光源駆動装置であって、
前記雑音発生源は、サーミスタと，該サーミスタに電流を流す電源回路と，前記サーミスタの端部に発生する電圧を増幅する増幅回路とを備え，該増幅回路の出力が雑音として出力される光源駆動装置。
【請求項９】請求項７又は８に記載の光源駆動装置であって、前記増幅回路の利得を調整する利得調整手段を更に備える光源駆動装置。
【請求項１０】請求項１から９のいづれか１項に記載の光源駆動装置であって、
前記雑音発生源の発生する信号のうち，所定の周波数以下及び所定の周波数以上の信号を除去するフィルタ回路とを備える光源駆動装置。
【請求項１１】請求項１０に記載の光源駆動装置であって、
前記フィルタ回路は，０．１Ｈｚから１０Ｈｚの周波数範囲の信号を通過させるバンドパスフィルタである光源駆動装置。
【請求項１２】ゆらぎ信号生成装置であって，周波数をｆとした時に，１／ｆのゆらぎ信号を発生する１／ｆのゆらぎ信号発生源と，該１／ｆのゆらぎ信号発生源の発生する信号のうち，所定の周波数以下及び所定の周波数以上の信号を除去するフィルタ回路とを備えることを特徴とするゆらぎ信号生成装置。
【請求項１３】請求項１２に記載のゆらぎ信号生成装置であって，前記フィルタ回路は，０．１Ｈｚから１０Ｈｚの周波数範囲の信号を通過させるバンドパスフィルタであるゆらぎ信号生成装置。
【発明の詳細な説明】
【０００１】
【発明の属する技術分野】本発明は，白熱電球やＬＥＤ等の光源でろうそくの発光する自然の明暗パターンを模擬する光源駆動装置及びそのような駆動を実現するためのゆらぎ信号生成装置に関する。
【０００２】
【従来の技術】白熱電球やＬＥＤ等の電気的点灯具を用いて，ろうそくの炎を模擬し，ろうそくを使用したのと同じような照明感を得られるようにすることが行われている。たとえば，特開平６－５２７０９号公報は，ろうそくの炎の形に模擬した電球を用い，発振器に接続された電磁石に接近して配置された金属片に電球ユニットを取り付け，機械的に振動させることにより，発光を不規則にオン・オフさせる方法を開示している。しかし，この方法では電球が機械的に揺動するだけであり，不規則性を出すために商用電源や発振器からの信号を変化させるにしても，発光の明暗は変化せず，ろうそくの発光に比べて不自然さが残っている。また，電球のフィラメントを発光に応じて振動させたりする方法もあるが，いづれも不自然な発光であり，ろうそくの出す明暗のパターンとは異質のものである。
【０００３】一方，特開平２－４４６９３号公報は，より人間の心地よい照明を得るために，いわゆる１／ｆゆらぎに従って照明器具の照度を変化させる方法が開示されている。ここに開示されている方法は，より人間の心地よい照明を得るための方法であり，白熱電球でろうそ

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くの炎を模擬する方法ではないため，ろうそくを使用したのと同じような照明感を得ることは出来ない。また，特開平２－４４６９３号公報には，ゆらぎ信号を生成する方法として，抵抗の両端における微細な電圧のゆらぎを利用する方法や，ＲＯＭにあらかじめ１／ｆゆらぎを有する数値列を記憶しておき，それを読み出してゆらぎ信号を生成する方法が開示されている。

【０００４】更に，特開平７－１４６８０号公報は，白熱電球のようなオン・オフ時点から実際に発光・消光するまでの時間遅れにより１／ｆゆらぎに応じた点灯にならないことを改良するため，駆動信号を分割して，それぞれの信号を別々に遅延させた上で合成して発光させる装置が開示されている。しかし，この装置も，白熱電球でろうそくの炎を模擬する装置ではないため，ろうそくを使用したのと同じような照明感を得ることは出来ない。

【０００５】

【発明が解決しようとする課題】以上説明したように，上記の公知例には白熱電球やＬＥＤ等の電気的光源でろうそくを模擬する方法又は装置はない。従って，風があるとそれに応じてそよぐろうそく特有の発光状態については何ら言及されておらず，そのような発光状態を実現する為の光源駆動装置及び駆動方法については，何ら開示がない。

【０００６】電気的光源でろうそくを模擬してろうそくのような発光状態を実現するには，風が吹くと消滅しそうになったり，逆に明るくなったりするろうそくの自然な発光状態を模擬する必要があるが，このようなろうそくの炎特有の発光状態を模擬することはできなかった。

【０００７】本発明は，電気的光源でろうそくの炎を模擬し，電気的光源であたかもろうそくが点灯されているが如き発光を人工的に得ることができる光源駆動装置及びそのためのゆらぎ信号発生装置を実現することを目的とする。

【０００８】

【課題を解決するための手段】図１は，本発明の第１の態様の光源駆動装置の基本構成を示す図である。上記目的を達成するため，本発明の光源駆動装置は，図１に示すように，ランダムな雑音を発生する雑音発生源１と，雑音発生源の出力信号に基づいて光源６を駆動する駆動回路５とを備える光源駆動装置において，雑音発生源１として温度変化に応じて発生する雑音を変化させるものを使用し，雑音発生源を外部からの風の影響を受けるように配置したことを特徴とする。

【０００９】雑音発生源が外部からの風の影響を受けるようにするため，例えば、光源駆動装置を収容する筐体に穴を設け，雑音発生源がこの穴から風を受けるように配置したり，雑音発生源の一部が筐体の外部に出るようにする。

【００１０】光源をパルス駆動し、そのパルス幅を変化させてろうそくを模擬する場合には、雑音発生源１が出力する信号の周波数範囲より高い周波数で周期的に変化し、前記雑音発生源が出力する信号の変化範囲より大きな振幅の所定の基準信号と比較し、比較結果に基づいてパルス信号を生成する比較回路を設けて、このパルス信号に基づいて光源を駆動する。

【００１１】温度変化に応じて発生する雑音を変化させる雑音発生源としては、例えば、ツェナーダイオードやサーミスタを使用し，それらに電流を流した時に発生する電圧を増幅して雑音信号とする。電圧の増幅度を可変にすることにより，ゆらぎの状態を変化できるようにすることが望ましい。

【００１２】また，雑音発生源の発生する信号のうち，所定の周波数以下及び所定の周波数以上の信号，例えば，０．１Ｈｚから１０Ｈｚの周波数範囲の以外の信号は除去することが望ましい。

【００１３】更に，本発明のゆらぎ信号生成装置は，周波数をｆとした時に，１／ｆのゆらぎ信号を発生する１／ｆゆらぎ信号発生源と，１／ｆのゆらぎ信号発生源の発生する信号のうち，所定の周波数以下及び所定の周波数以上の信号を，例えば，０．１Ｈｚから１０Ｈｚの周波数範囲の以外の信号は除去するフィルタ回路とを備える。

【００１４】抵抗，ツェナーダイオードやサーミスタ等に電流を流したときに，その端に生じる電圧は，微小にランダムに変化しており，特開平２－４４６９３号公報は，それらの雑音が，周波数をｆとした時に，１／ｆスペクトルを有することを開示している。従って，この雑音を大きな利得で増幅することにより，１／ｆスペクトルを有するランダムな雑音信号を生成することが考えられる。また，抵抗，ツェナーダイオード，サーミスタ等に電流を流したときに，その端に生じる電圧は，温度変化に応じて変化することが知られている。そのため，表面に当たる風が変化して温度が微小にでも変化すると，雑音が大きく変化する。そこで，抵抗，ツェナーダイオード，サーミスタ等の端に生じる雑音を増幅してゆらぎ信号を生成し，そのゆらぎ信号で光源を駆動する場合に，抵抗，ツェナーダイオード，サーミスタ等の雑音発生源を風の影響を受けるように配置し，それにより温度が変化するようにすれば，風にそよぐ様子を模擬することが可能になる。

【００１５】ツェナーダイオードやサーミスタは，抵抗等に比べて，発生する電圧が温度変化に応じて変化する率が大きく，このような目的で使用するのに適している。例えば，９Ｖのツェナーダイオードの変化率は数ｍＶ／℃程度であり，ツェナー電圧によって正負逆の特性である。そのため，ツェナー電圧を増幅すると１／ｆに類似したゆらぎ信号を生じるが，温度変化があると大きく変化する成分が加算される。風等の影響を受ける位置にツェナーダイオードを配置し，風等の影響でその温度

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が微小ではあるが瞬間的に変化すると，それに応じてツェナー電圧のゆらぎも大きくなる。従って，風等に心じてツェナー電圧のゆらぎが大きくなり，あたかもろうそくが風にゆらぐような発光状態を実現することができる。上記のような正負逆の特性であっても，ゆらぎの生じ方は同じである。

【００１６】光源の発光状態を変化させる場合，駆動電流や駆動電圧を変化させるようにするより，パルス信号で駆動し，そのパルス幅を可変にする方が容易である。そこで，雑音発生源から出力される雑音信号に応じてパルス幅が変化する信号（ＰＷＭ信号）を発生させることが考えられる。雑音発生源の温度がゆっくり変化した場合，雑音信号のレベルが変化することになる。そのため，単に雑音を一定のレベル信号と比較してパルス信号を生成したのでは，非常に明るく点灯する状態と非常に暗いほとんど消灯した状態が長く続くことがあり得る。このような状態はろうそくを模擬する上で好ましくない。特にほとんど消灯した状態が長く続くと，使用者に故障の発生と思わせる恐れがある。そこで，雑音発生源が出力する信号の周波数範囲より高い周波数で周期的に変化し，前記雑音発生源が出力する信号の変化範囲より大きな振幅の所定の基準信号と比較してパルス信号を生成するようにすれば，風が吹き付けられた場合等は大きく変化するが，通常はゆらぎがあまり大きくない状態で点灯させることができる。

【００１７】また，上記のように，気温が変化して装置の周囲の雰囲気全体の温度が変化した場合には，ツェナー電圧のレベルが大きく変化するので直流成分は除去することが望ましい。更に，ある程度以上速い変化は人間にはあまり認識できず，ろうそくを模擬する上では不必要なだけでなく，その周波数成分は除去した方がよい。また，低い周波数成分は，ゆっくりした変化を発生させるが，人間はそのような変化を認識するのが難しくろうそくの炎を模擬する上では，不必要であるだけでなく，ゆらぎ信号の平均レベルが変動するので，明るさのレベルが大きく変化するという問題を生じる。そのため，ある程度以下の周波数成分，例えば，０．１Ｈｚ以下の周波数成分は除去することが望ましい。これは，照明のための光源の駆動に限らず，人間に自然な感覚を与えるためのゆらぎ信号に共通していえることである。

【００１８】

【発明の実施の形態】図２は，本発明の光源駆動装置を使用した照明装置の実施例の基本構成を示す図であり，図３はその比較回路におけるパルス信号の発生原理を説明する図である。

【００１９】図２の照明装置は，白熱電球のランプ６に流れる電流を，ＦＥＴ５のスイッチでオン・オフ制御するもので，ＦＥＴ５がオンになる時間の比率（デューティ比）を変化させることによりランプ６の明るさが変化する。雑音発生源１はμＶからｍＶの微小な雑音信号を発生する。バンドパスフィルタ・ゲインコントロール増幅器２は，雑音発生源１の発生する微小な雑音信号を高い利得で増幅する増幅機能と，所定の周波数範囲の信号のみを通過させ，この周波数範囲外の信号を減衰させるバンドパスフィルタ機能とを有する。増幅の利得は調整可能である。基準信号発生回路３は，バンドパスフィルタ・ゲインコントロール増幅器２が出力する信号の周波数範囲より高い周波数で周期的に変化し，バンドパスフィルタ・ゲインコントロール増幅器２が出力する信号の変化範囲より大きな振幅の基準信号を発生する。基準信号としては，鋸歯状信号や３角波状信号が望ましいが，正弦波状信号等の信号でもよい。コンパレーター４は，バンドパスフィルタ・ゲインコントロール増幅器２の出力する雑音と基準信号発生回路３が出力する基準信号とを比較してパルス信号を生成する。図３を参照してパルス信号の発生を説明する。

【００２０】図３に示すように，バンドパスフィルタ・ゲインコントロール増幅器２からは図示のような雑音が出力され，基準信号として３角波が出力される。基準信号はバンドパスフィルタ・ゲインコントロール増幅器２が出力する雑音信号の周波数範囲より高い周波数で周期的に変化し，雑音信号の変化範囲より大きな振幅の信号である。また，バンドパスフィルタ・ゲインコントロール増幅器２が出力する雑音信号の平均レベルは，３角波の中間レベルになるように設定されている。そのため，コンパレーター４には図示のような信号が入力されることになる。コンパレーター４は，入力される２つの信号を比較し，基準信号が雑音信号より大きいときには「高」に，小さいときには「低」になるパルスを発生させる。雑音信号はランダムに変化するので，発生されるパルス信号のパルス幅が変化し，ランプ６の明るさも変化する。

【００２１】図４は本発明の第１実施例の光源駆動装置の回路構成を示す図である。第１実施例の光源駆動装置は，光源として白熱電球を，電源としてＡＣ１００Ｖ等の商用電源を使用した例である。

【００２２】三角波である鋸歯状波を生成するために，Ｃのピーク電圧が約１４１Ｖと高いので通常のオペアンプで使える入力電圧を得るために抵抗７，８の直列接続によって低電圧の１４～１５Ｖ程度の波形ｆが得られ，コンパレータ１１の負入力に接続される。一方コンパレータ１１の正入力にはスレショルド電圧を得るために抵抗９，１０が使われる。例えば負入力のピークを１３Ｖ程度にすると，正入力はＤＣ２．５Ｖに設定する。これによりコンパレータ１１の出力は細い短形波形ｇが発生する。さらにこれを鋸歯状波とするためにダイオード１２とコンデンサ１４により波形ｈに示す鋸歯状波形が生成できる。ダイオード１２に並列に接続されたコンデンサ１３は鋸歯状波の立ち上がりを速くする為に用いられる。一方ノイズの発生及び生成はツェナーダイオード１

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５を用いて，オペアンプ１６へツェナー駆動電流を得るための抵抗１８，１９を通して正入力として接続される。オペアンプ１６はバンドパスフィルター機能を有する高ゲイン増幅器であり，ノイズ発生源であるツェナーダイオードの微小交流ノイズ成分のみを増幅する。ゲインは抵抗２２と抵抗２１の比で与えられるそれぞれをＲ１，Ｒ２とすると，Ｇ＝１＋（Ｒ２／Ｒ１）となる。さらにローパスフィルターとしてコンデンサ２３が抵抗２２に直列に接続され設置されているので，ハイパスフィルターとして働く。

【００２３】例えば０．１ＨＺをカット周波数とするとＲ１＝１５ＫΩ，Ｒ２＝２．２ＭΩを用いるとＣ＝２２μＦ程度となり１２ｄＢの減衰特性を持つ。一方，抵抗２１のＲ２に並列にコンデンサ２０を接ぐことでローパスフィルター機能となり１０ＨＺのカット周波数付近に設定すると０．２２μＦ程度となる。本例ではゲインは前式を用いて約１５０倍程度になる。さらに増幅度を上げるためとフィルター特性を急峻にするためにオペアンプ１７の増幅器を接続し，ゲインを調整できるように帰還抵抗Ｒ２を可変抵抗器２６を用意する。ハイパスフィルターの特性を急峻とするためコンデンサ２５を倍の４７μＦを使用すると効果的である。２段増幅器によりフィルターの減衰特性は１８ｄＢとなり，ろうそくの炎らしさを出すために有効な手段である。尚，オペアンプの入力に接続された抵抗１９，２４は働く。ノイズ発生電圧は２段の増幅器で４０ｄＢ程度の増幅度となり鋸歯状波と比較レベルになる。本例ではオペアンプを１５Ｖで働かせたとして鋸歯状波のピーク電圧が約１５Ｖ，周波数は交流商用電源周波数の倍の１００又は１２０ＨＺである。ノイズ電圧は約９～１０Ｖ中心としてノイズ信号は０Ｖから１５Ｖまでの間をふらふらしている。従って，図１で説明したように鋸歯状波信号とノイズ信号をオペアンプ４に接続しノイズ信号のレベルに応じてパルス幅の変化する２値出力信号が得られ，ＦＥＴ５のゲートに接続され，ランプをオンオフする。又，図中抵抗２７，ツェナーダイオード２８，コンデンサ２９はオペアンプの電源を得るための定電圧電源である。

【００２４】以上説明したように，第１実施例の光源駆動装置では，ランプ６を点灯するパルス信号のパルス幅がランダムに変化するので，点灯状態がゆらいでろうそくに近い感覚を与える。特に，ランプ６の回りを半透明のガラス等で囲うと，より一層ろうそくに近い感覚を与える。また，ツェナーダイオード１５は，温度変化に敏感であり，微小でも急激な温度変化があるとゆらぎが大きくなる。これを利用して，一層風にゆらぐ感覚が得られるための構造について説明する。

【００２５】図５は，第１実施例の光源駆動装置を使用した照明装置の外観と内部の様子を示す図である。図５の（１）に示すように，この照明装置はろうそくを模した形状をしており，白い筐体５０にランプ６が取り付けられる。図４に示した光源駆動装置の回路は，筐体５０に収容される。また，筐体５０には穴５１が設けられており，外部の風が筐体５０の内部に吹き込むようになっている。また，図５の（２）に示すように，図４に示した光源駆動装置の回路が形成されたプリント基板５２は筐体５０に取り付けられており，ツェナーダイオード１５は筐体５０に設けられた穴５１の近くに位置するように配置されており，この穴５１を通って外部の風が吹き込むとツェナーダイオード１５の表面に当たり，その温度を微小ではあるが変化させるようになっている。従って，この照明装置を外に置いて風が当たるようにしたり，息を吹きかけると，ランプ６の点灯状態が大きく変化し，ろうそくのような感覚を与える。図４に示した光源駆動装置の回路は，たとえ風が当たらなくても雑音信号が発生されるので，室内で風がない状態に保持されてもゆらいだ点灯になり，ろうそくのような感覚を与えるが，図５に示すような構造をとることにより，風の影響を受けて点灯状態が変化するので，一層ろうそくのような感覚を与える。

【００２６】また，図６は照明装置の別の例を示す図である。この場合，図６の穴の替わりに，熱伝導性のよい材料で作られたツェナーダイオード１５の表面から外部に延びる部材５３を設け，部材５３の表面に風が当たって温度が変化すると，それがツェナーダイオード１５に伝わるようにしたものである。

【００２７】図７は，商用交流電源の替わりに電池３４を使用し，白熱電球の替わりにＬＥＤ３３を使用した第２実施例の光源駆動装置の回路構成を示す図である。発振器３１を設け，オペアンプ１１の負入力へ接続し，鋸歯状波を得るようにしている。また，色は異なるがＬＥＤ３３を使用するもので，小型化が可能である。ＬＥＤの替わりに小型の豆電球を使用することもできる。

【００２８】

【発明の効果】以上説明したように，本発明によれば，電気的点灯具で一層ろうそくに近い点灯感覚を与えることのできる光源駆動装置が実現できる。

【図面の簡単な説明】

【図１】本発明の第１の態様の光源駆動装置の基本構成を示す図である。

【図２】本発明の光源駆動装置を使用した照明装置の実施例の基本構成を示す図である。

【図３】本発明の光源駆動装置における駆動用パルス信号の発生を説明する図である。

【図４】本発明の第１実施例の光源駆動装置の構成を示す回路図である。

【図５】第１実施例の態様の光源駆動装置を使用した照明装置の外観と内部構造を示す図である。

【図６】第１実施例の光源駆動装置を使用した照明装置の外観と内部構造の例を示す図である。

【図７】本発明の第２実施例の光源駆動装置の構成を示

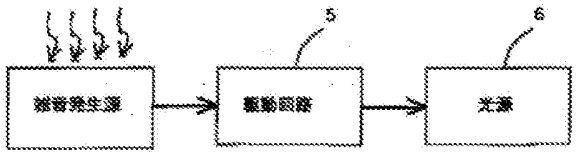
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す回路図である。

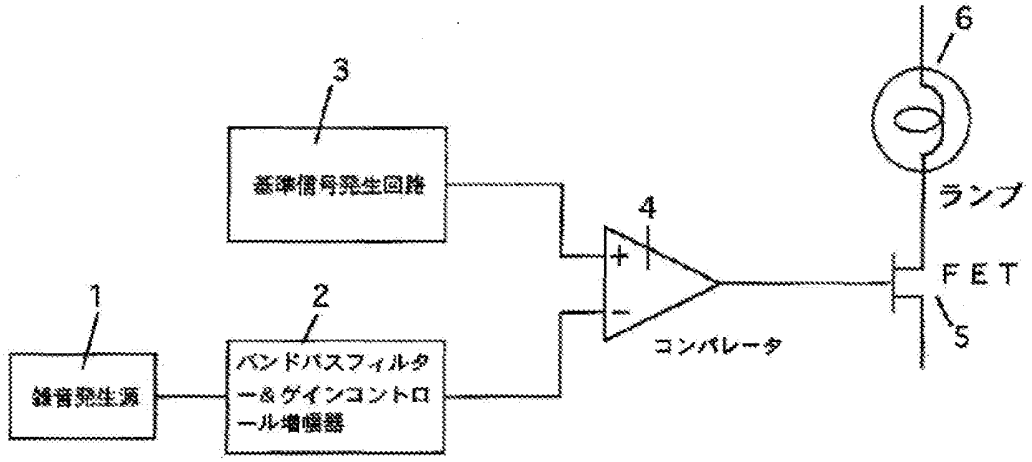
【符号の説明】

1．雑音発生源
2．バンドパスフィルタ・ゲインコントロール増幅器
3．基準信号発生回路
4．比較器
5．駆動回路
6．光源（ランプ）
7．抵抗
8．抵抗
9．抵抗
10．抵抗
11．比較器
12．ダイオード
13．スピードアップコンデンサ
14．コンデンサ
15．雑音発生用ツェナーダイオード
16．バンドパスフィルタ付増幅器
17．バンドパスフィルタ付増幅器
18．抵抗
19．抵抗
20．コンデンサ
21．抵抗
22．抵抗
23．コンデンサ
24．抵抗
25．コンデンサ
26．ゲイン調整用トリマ抵抗
27．抵抗
28．ツェナーダイオード
29．コンデンサ
30．ブリッヂダイオード
31．発振器
32．抵抗
33．LED
34．電池
50．筐体
51．穴
52．プリント基板
53．部材
e．全波整流波形
d．コンパレータの出力を示す図
e．ブリッジ整流後の電圧波形を示す図
f．ブリッジ整流後のコンパレータ入力波形を示す図
g．コンパレータの出力パルスを示す図
h．生成した雑音状波形を示す図
i．増幅後のノイズを示す図

【図1】

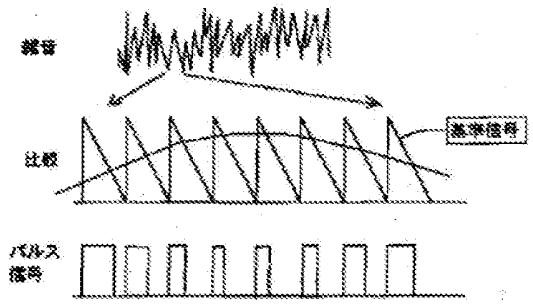


【図2】

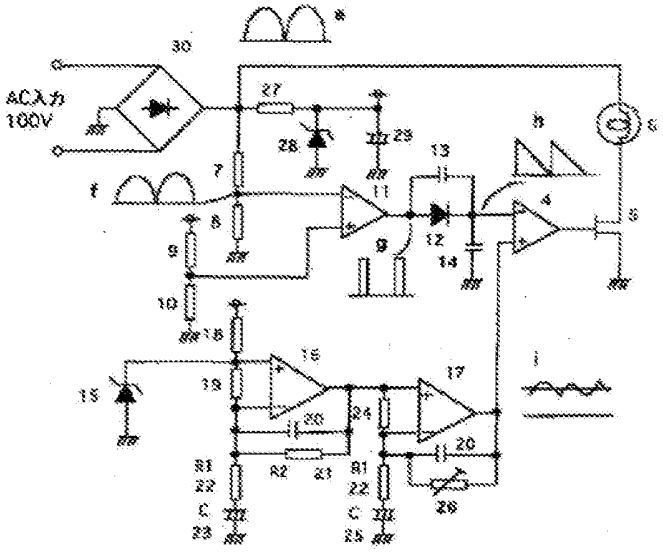


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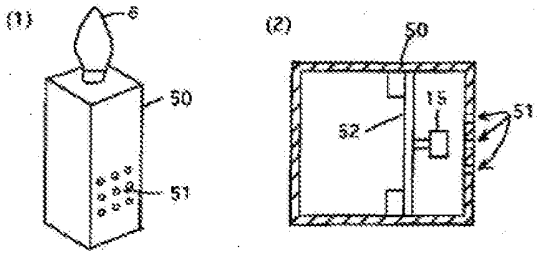
【図３】



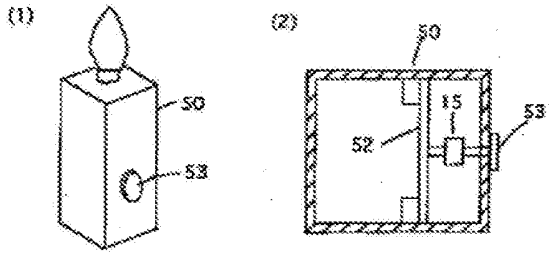
【図４】



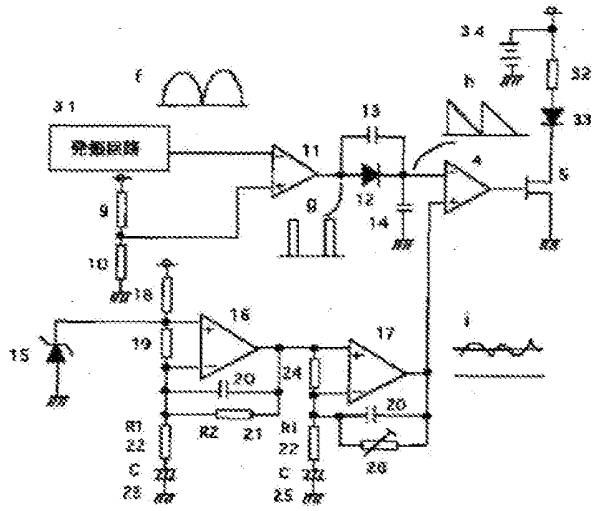
【図５】



【図６】



【図７】



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Certificate

Date: March 10, 2017

To whom it may concern:

I, [Luyan, WANG], a translator fluent in the Chinese and English languages, do solemnly and sincerely declare that the attached translation is, to the best of my knowledge and belief, a true and accurate translation from Chinese Utility Model Patent No.: ZL 97216131.7, Publication No.: CN 2293957Y. I have been warned that willful false statements and the like are punishable by fine or imprisonment, or both. I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Luyan, WANG

Signature

Luyan, WANG

Print

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[19] State Patent Office of People's Republic of China

[51] Int. Cl[6]
A24F 47/00

[12] Description of Utility Model Patent

[21] Patent No. ZL 97216131.7

[45] **Date of patent**: October 14, 1998

[11] **Patent publication No**. CN 2293957Y

[22] **Application date**: May 23, 1997

[21] **Application number**: 97216131.7

[24] **Issue date**: September 5, 1998

[74] **Agent**: Peilan GUO, Beijing Patent agency

[73] **Patentee**: Yuzhong, ZHAO

Address: 171 East Diaoyutai, Haidian District, Beijing, 100037.

[72]**Inventor**: Yuzhong, ZHAO

1 Claims , 2 Description, 2 Drawing sheets

[54] **Title**

ELECTRONIC SMOKING CONTROLLER

[57] **Abstract**

An electronic smoking controller comprises a casing, wherein one end of the casing is provided with a mouthpiece and a dust filter. A perfume barrel whose two ends are respectively covered by a top cover and a bottom cover is also provided inside the casing and the top cover is tightly pressed by two magnetic rings. A perfume carrier is arranged between the top cover and the bottom cover which are connected by a guide wire and the guide wire constitutes a switch together with a trigger electrode. Besides, the inner of the casing is additionally provided with a music mechanism and batteries. When the mouthpiece is sucked on, negative pressure generates in the mouthpiece and then opens the perfume barrel, air is allowed to enter the perfume barrel, which is converted to fragrance to be inhaled by a user, meanwhile, the music mechanism sends out music, and a light emitting diode (LED) flashes in company with the melody. The electronic smoking controller functions to emanate fragrance, sound, flashing, etc.

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CLAIMS

What is claimed is:

1. An electronic smoking controller, wherein the electronic smoking controller comprises a casing and the casing is provided with a mouthpiece and a dust filter on one end thereof; a perfume barrel whose two ends are respectively covered by a top cover and a bottom cover is also provided inside the casing; a magnetic ring provided on the periphery of the top cover corresponds to another magnetic ring in the perfume barrel; a perfume carrier is arranged between the top cover and the bottom cover which are connected by a guide wire and the guide wire constitutes a switch together with a trigger electrode; the inner of the casing is additionally provided with a music mechanism consisting of an integrated circuit and a sounder and being powered by batteries; a LED within a cover is provided above the batteries.

2. The electronic smoking controller according to claim 1, wherein the sounder of the music mechanism is made of piezoelectric ceramic.

3. The electronic smoking controller according to claim 2, wherein the piezoelectric ceramic is in the shape of a rectangle, a half cylinder or a triangle.

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ELECTRONIC SMOKING CONTROLLER

Technical field

The utility model relates to a personal smoking controlling apparatus, in particular to an electronic smoking controller.

Background

It has become common knowledge that tobacco is harmful to human health in various aspects but there are still almost 50% of people who are involved in tobacco taking. There are more than ten kinds of toxic gas and carcinogenic substances in tobacco, which may cause a plenty of diseases even death. Apart from the harm to health of users and other people nearby, smoking also often gives rise to fire and explosion.

The World Health Organization (WHO) and national health departments have been calling the smokers to quit smoking, but the effect is very little. The reason for that is mainly that most smokers are not fully aware of the harm of tobacco, and it becomes extra difficult to resist the temptation of smoking. Besides, the lack of small and handy carriers for perfume blocks people's way to enjoy refreshing fragrance.

A dilemma is in front of us - smoking is harmful while quit smoking is difficulty, so "World Future Society" raises a solution. It points out people are in great need of novel technical products to substitute traditional cigarettes, which enable smokers to enjoy the tobacco taking but do no harm to human health, being non-addictive and curative to chest and lung diseases.

Summary

The present utility model aims to provide an electronic smoking controller. It retains the form of cigarettes and mimics the functional features of traditional cigarette, but removes the harmful substances thereof, so it can acts as a substitute of cigarette, and help smokers to quit smoking and enjoy fragrance from a variety of fragrant items.

The technical solution adopted by the present utility model is as follows: an electronic smoking controller comprises a casing and the casing is provided with a mouthpiece and a dust filter on one end thereof. A perfume barrel whose two ends are respectively covered by a top cover and a bottom cover is also provided inside the casing. A magnetic ring provided on the periphery of the top cover corresponds to another magnetic ring in the perfume barrel. A perfume carrier is arranged between the top cover and the bottom cover which are connected by a guide wire and the guide wire constitutes a switch together with a trigger electrode. The inner of the casing is additionally provided with a music mechanism consisting of an integrated circuit and a sounder and being powered by batteries. A LED within a cover is provided above the batteries.

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The perfume in the barrel can be selected according to one's need, for instance, nicotine oil with tobacco smell to substitute cigarettes, herbal medicine based on prescriptions for quitting smoking or healing diseases of respiratory system, compound natural perfume made of mint, lemon and so on, agonists capable of refreshing people and promoting working efficiency, or compound perfume consisting multiple spices, etc.

The utility model has novel well-designed structure which integrates music, flashing and fragrance together. Besides, no fire is needed and no pollutant is made. Therefore, the electronic smoking controller is capable of multiple functions, such as substituting cigarettes and helping to quit smoking.

Brief description of drawings

Hereinafter the utility model will be illustrated in detail with companying drawings.

Figure 1 is a front view of the present utility model.

Figure 2 is a schematic diagram of the structure of the perfume barrel.

Figure 3 is a side view of the battery barrel.

Figure 4 is a principle diagram of the circuit.

As shown in figure 1, a casing 3 can be formed by rounding a non-toxic polyethylene plastic part or plastic film, whose size is almost the same to a normal cigarette. About 20 holes 14 are punched on the casing, corresponding to the position of the music mechanism. A mouthpiece 1 is inserted into the casing 3 and inside the mouthpiece 1 is provided a dust filter 2 made of the same material with the filter tips of normal cigarettes. The perfume barrel is numbered as 6 while the top cover in the shape of a straw hat is numbered as 4. Two magnetic rings 5 correspond to each other, wherein one is on the periphery of the top cover and the other is arranged in the perfume barrel. The bottom cover 9, in the shape of a bowl, is secured to the recess of the bottom barrel 8. The top cover 4 and the bottom cover 9 are connected by a guide wire and the guide wire is stuffed with perfume carrier 7 made from the same material with the dust filter, the perfume carrier 7 is loaded with perfume particles or fully saturated by liquid perfume. A sounder 12 is made of piezoelectric ceramic with frequency between 2000-8000Hz and in the shape of a half cylinder, a triangle, or a rectangle etc. The integrated circuit 13 may be selected from KD-9300 series. A trigger electrode 11 stretches from the integrated circuit 13 and together with the guiding wire 10 constitutes a trigger switch K. A retaining clip is numbered as 19 while a battery barrel is numbered as 15. Three button batteries 16 are connected in series and placed in the battery barrel where output voltage of each is 1.55 V. A LED 17 can be selected from HG 300 series and a red light cover 18 is arranged on the top of the controller.

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DESCRIPTION

Figures 2-3 shows the perfume barrel 6, the bottom barrel 8, the top cover 4, the bottom cover 9, the retaining clip 19, the strip 20 for sealing batteries while figure 4 shows the LED 17, the sounder 12, the integrated circuit 13, battery pack 16 and the switch K, wherein the sounder 12 and the integrated circuit 13 are connected in parallel.

The operation of the mentioned structure is as follows: a user sucks on the mouthpiece 1 and the magnetic rings are disengaged, and then the top and bottom covers open at the same time; air flows into the casing via holes 14 and acts as a gas carrier to carry fragrance into the user's oral cavity; meanwhile, the guide wire 10 of the switch K is connected to the trigger electrode 11, allowing the integrated circuit to be activated and then the sounder 12 is driven to play music and LED flashes along with the music.

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DRAWINGS

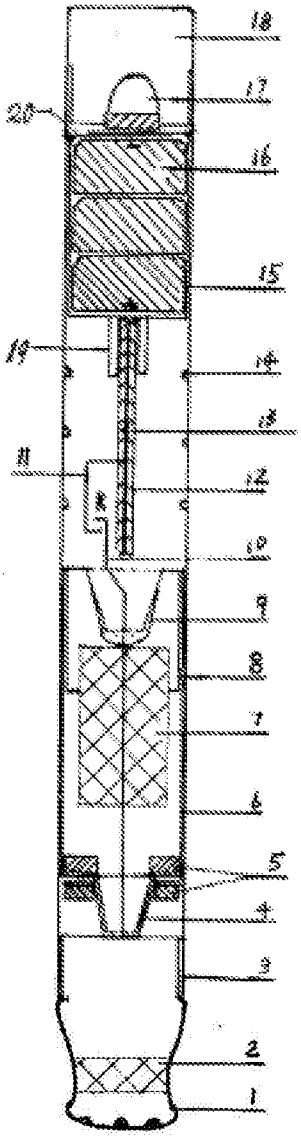


Figure 1

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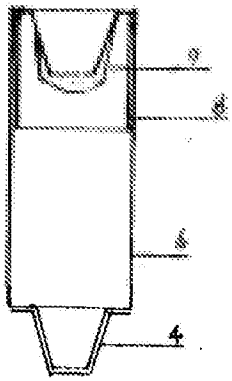


Figure 2

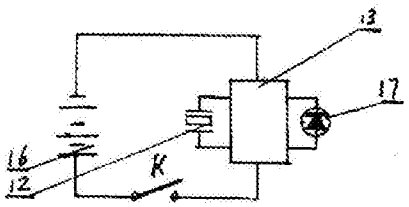


Figure 4

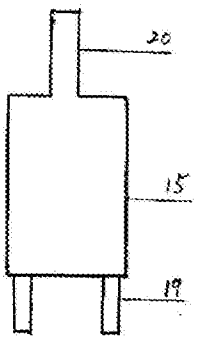


Figure 3

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[19]中华人民共和国专利局

[51]Int.Cl[6]
A24F 47/00

[12]实用新型专利说明书

[21] ZL 专利号 97216131.7

[45]授权公告日 1998 年 10 月 14 日

[11] 授权公告号 CN 2293957Y

[22]申请日 97.5.23 [24]颁证日 98.9.5

[73]专利权人 赵玉忠
地址 100037北京市海淀区东钓鱼台171号
[72]设计人 赵玉忠

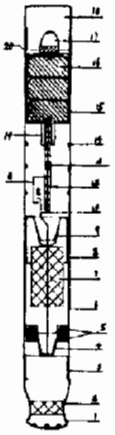
[21]申请号 97216131.7
[74]专利代理机构 北京市专利事务所
代理人 郭佩兰

权利要求书 1 页 说明书 2 页 附图页数 2 页

[54]实用新型名称 电子控烟器

[57]摘要

一种电子控烟器，它包括外壳，壳内的一端装有吸嘴、滤尘器，壳内还装有香料筒，香料筒两端盖有上盖、底盖，上盖以二个磁环压紧，在上盖与底盖的中间为香料载体，上盖、底盖之间以导丝连接，导丝与触发极构成开关，壳内还装有音乐机构，电池。当抽吮吸嘴后，烟嘴内产生负压，香料筒盖被打开，空气进入香料筒内，香气被人吸入，音乐机构奏出音乐，发光二极管随着乐曲闪光。本控烟器具有香、声、光等多功能。



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权　利　要　求　书

1、一种电子控烟器，其特征在于它包括：外壳，壳内的一端装有吸咀、滤尘器，壳内还装有香料筒，香料筒两端分别盖有上盖、底盖，上盖边沿上的磁环与筒内磁环相对应，上盖与底盖的中间为香料载体，上盖、底盖之间以导丝连接，导丝与触发极组成开关，壳体内还装有音乐机构，该机构包括集成电路和发音体，音乐机构由电池供电，电池的上方为发光二极管，二极管外罩一灯帽。

2、根据权利要求 1 所述的电子控烟器，其特征在于：所述的音乐机构的发音体为压电陶瓷。

3、根据权利要求 2 所述的电子控烟器，其特征在于：所述的压电陶瓷形状为长方形或半圆柱面形或三角形。

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说　明　书

电子控烟器

本实用新型涉及一种个人控烟用具，特别是一种电子控烟器。

据报导当前吸烟的人约占人类的半数，吸烟有害已成公论，而且是多方面的，香烟烟气中含有十多种有毒和致癌物质，它们能导致许多疾病及死亡。香烟烟雾吸进去害已，吐出来害人。常引起火灾和爆炸。

世界卫生组织和各国的已生机构号召人们戒烟，但效果很不理想，为什么如此困难如此不理想？主要是许多烟民对吸烟的危害认识半信半疑，对强大的吸烟势力的诱惑难以抗拒，再加上生理、心理、社交、习惯、消除口腔异味等多种需要，烟民很不情愿丢掉这支小棒！此外人们正在追求芳香怡人的气体享用，总感到缺少携带方便使用灵巧的装载物。

面对吸烟有害、戒烟又难这个两难选择，“世界未来学会”提出一个解决方案，它指出人类急需健康吸烟法科技产品，它规定“一种既能使吸烟者享受（自感的）吸烟乐趣，但又无损健康，不上瘾的香烟或一种能治胸肺病的香烟”。

本实用新型的目的是提供一种电子控烟器，它保留了香烟的形式、去掉了有害内容，模拟普通香烟的功能特点，可以代烟、戒烟、享受多种芳香物质的芳香气味。

为达到上述目的，本实用新型采用以下技术方案：这种电子控烟器包括：外壳，壳内的一端装有吸咀、滤尘器，壳内还装有香料筒，香料筒两端分别盖有上盖、底盖，上盖边沿上的磁环与筒内磁环相对应，上盖与底盖的中间为香料载体，上盖、底盖之间以导丝连接，导丝与触发极组成开关，壳体内还装有音乐机构，该机构包括集成电路和发音体，音乐机构由电池供电，电池的上方为发光二极管，二极管外罩一灯帽。

上述香料筒中放入的香料可以按需要决定，例如：放入具有烟草气味的烟碱以代烟；用中草药配制的戒烟方剂以戒烟；或者是用薄荷、柠檬等配制的复方天然香料，可以使人精神振奋，提高工作效率等兴奋型；也可以是多种香料构成的复方香料剂型；还可放置治疗呼吸系统疾病的中草药制剂等。

本实用新型优点：本新型结构新颖，集音乐、闪光、香气为一体，它不用火，无污染。可起到代烟、戒烟等多功能。

下面结合附图对本实用新型作进一步说明。

图 1 为本实用新型的主视图

图 2 为香料筒结构示意图

图 3 为电池筒的侧视图

图 4 为电路原理图

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图 1 中， 3 为外壳，可用无毒聚乙烯塑料件或薄膜纸卷绕而成，大小与普通香烟相近，对应于音乐机构位置的壳体上开有小孔 14 ，其数量约20 个，1 为吸咀，它插入外壳 3 内，吸咀内有滤尘器 2 ，材料与香烟过滤咀材料相同， 6 为香料筒， 4 为上盖，呈草帽形， 5 为磁环，这二块磁环相对应，一个位于上盖周沿，另一块放在香料筒内， 9 为底盖，呈碗形，扣在底筒 8 的内凸口上，上盖 4 与底盖 9 之间以导丝 10 连接，导丝中装有香料载体 7 ，其材料同滤尘器，在载体内放置香料颗料或用液体香料浸渍并饱和， 12 为发音体，用压电陶瓷构成 其形状可为半圆柱面形、三角形、 高能的长方形等，其频率在2000 - 8000Hz 内， 13 为集成电路，可用 KD - 9300 系列，由 13 引出触发极 11 ，它与导丝 10 共同构成触发开关 K ， 19 为固定夹， 15 为电池筒，筒内放有扣式电池 16 ，共有三颗，每颗电压均在 1.55 伏，三颗串联， 17 为发光二极管，可用 HG300 系列， 18 为位于顶部的红色灯帽。

图 2 、图 3 中 6 为香料筒， 8 底筒、 4 为上盖、 9 为底盖、 19 为固定夹， 20 为包封电池的封紧带，图 4 中，发光二极管 17 、发音体 12 与集成电路 13 并联， 16 为电池组， K 为开关。

上述结构的动作过程是：用咀抽吮吸咀 1 ，磁环 5 脱开，那么上盖、底盖同时打开，空气由孔 14 吸入筒内，并作为载气把香气送入口腔内，与此同时，开关 K 的导丝 10 与触发极 11 接通，集成电路被触发，驱动发音体奏出音乐，同时发光二极管随着乐曲闪光。

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说　明　书　附　图

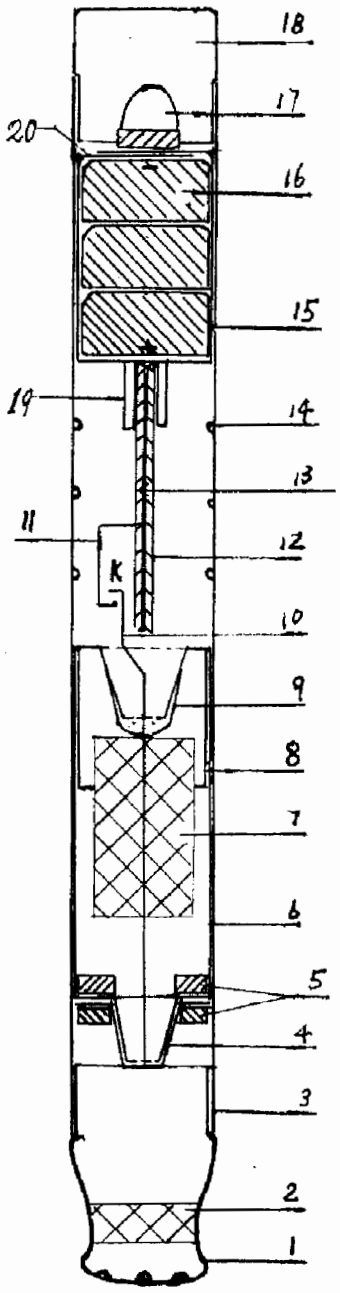


图1

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说　明　书　附　图

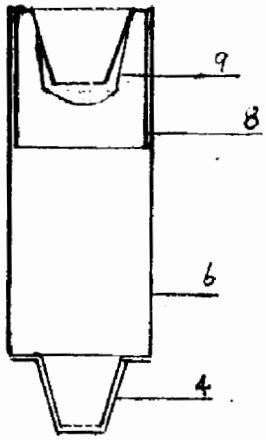


图2

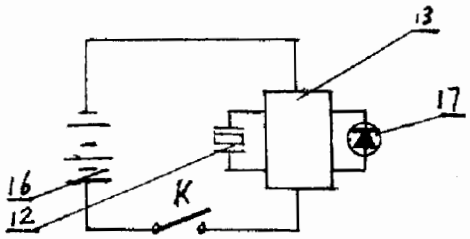


图4

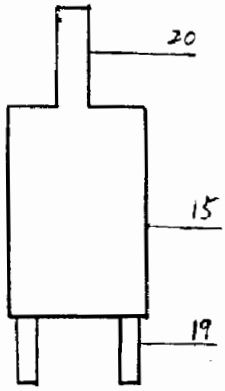


图3

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[19] State Intellectual Property Office of the People's Republic of China

[12] Invention Patent Application Publication [51]Int.Cl[6]

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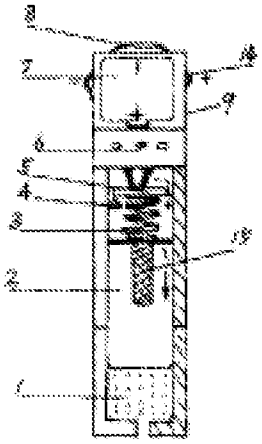
[72] Inventor: Gao Hongbin

This publication contains 1 page of claims, 2 pages of description, and 1 page of drawings

[54] Title: Liquid odor cigarette

[57] Abstract

The liquid odor cigarette relates to a type of cigarette. It comprises a cigarette liquid and a cigarette holder. The cigarette liquid is prepared by use of pepper juice, carrot juice, wind medicated oil and alcohol etc. The cigarette holder comprises an outer casing, a filter tip, a smoking material evaporation chamber, air intake vents, a valve plate, a power supply battery, an indicator, and an electronic heater. The cigarette holder might also comprise an inner casing, a mezzanine, and a chemical substance which can be triggered by a metallic plate to give out heat. The advantage of the present invention is free of any poison, harm, or environment pollution, and benefits people's health.



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Claims

1. A liquid odor cigarette relates to a type of cigarette, characterized in that a filter tip [1] is set at one end of the outer casing [9] of the cigarette holder, a smoking material evaporation chamber [2] is set above the filter tip, air intake vents [6] are set above the smoking material evaporation chamber, and a suction control valve plate [5] and a spring [3] are set between the smoking material evaporation chamber and the air intakes.

2. The liquid odor cigarette according to claim 1, characterized in that an indicator [8] is set at the other end of the outer casing of the cigarette holder, a power supply battery [7] is installed under the indicator, one electrode of the power is connected to the indicator and the other electrode is connected to the valve plate [5], a power contactor [4] is set under the valve plate, and the power contactor is connected to the indicator with a wire.

3. The liquid odor cigarette according to claim 2, characterized in that an electronic heater [15] is set in the smoking material evaporation chamber, one electrode of the electronic heater is connected to the power supply battery with a wire, the other electrode is connected to the power contactor [4], and an external power supply [14] is set on the outer casing of the cigarette holder.

4. A liquid odor cigarette relates to a type of cigarette, characterized in that an inner casing [10] is set in the outer casing [9] of the cigarette holder, a mezzanine is reserved between the outer casing and the inner casing, a chemical substance which can be triggered by a metallic plate to give out heat is loaded in the mezzanine, the metallic triggering plate [13] is set in the mezzanine, a triggering plate button [12] is set on the outer casing, a filter tip [1] is set at the bottom of the outer casing, a smoking material evaporation chamber [2] is set above the filter tip, air intake vents [6] are set above the smoking material evaporation chamber, and a suction control valve plate [5] and a spring [3] are set between the smoking material evaporation chamber and the air intake vents.

5. The liquid odor cigarette according to claim 4, characterized in that an indicator [8] is set at the other end of the outer casing of the cigarette holder, a power supply battery [7] is installed under the indicator, one electrode of the power is connected to the indicator and the other electrode is connected to the valve plate [5], a power contactor [4] is set under the valve plate, and the power contactor is connected to the indicator with a wire.

6. A liquid odor cigarette relates to a type of cigarette, characterized in that 0.3 ml of pepper juice, 1 ml of carrot juice, 0.5 ml of ginger juice, 0.1 ml of wind medicated oil, and 0.1 ml of alcohol are mixed evenly.

Liquid Odor Cigarette

This invention relates to a type of cigarette.

The existing cigarettes do harm to the health of people and pollute the environment. The inventor of the present invention developed a smoking liquid which is free of any poison, harm, or environment pollution and benefits people's health.

The present invention is intended to design a liquid odor cigarette which is free of any poison, harm, or environment pollution.

The above-mentioned objectives are realized by adopting the following scheme:

0.3 ml of pepper juice, 1 ml of carrot juice, 0.5 ml of ginger juice, 0.1 ml of wind medicated oil, and 0.1 ml of alcohol are mixed evenly.

The cigarette holder of the liquid odor cigarette is designed as follows: A filter tip 1 is set at one end of the outer casing 9 of the cigarette holder, a smoking material evaporation chamber 2 is set above the filter tip, the vaporizable liquid cigarette is loaded in the smoking material evaporation chamber, air intake vents 6 are set above the smoking material evaporation chamber, a suction control valve plate 5 and a spring 3 are set between the smoking material evaporation chamber and the air intake vents, the valve plate touches closely against the air intake vents to close the air intake vents when the cigarette is not smoked, and the valve plate is sucked away when the cigarette is smoked.

To increase the fun of smoking, an indicator 8 can be set at the other end of the outer casing of the cigarette holder, a power supply battery 7 is installed under the indicator, one electrode of the power is connected to the indicator and the other electrode is connected to the valve plate 5, a power contactor 4 is set under the valve plate, and the power contactor is connected to the indicator with a wire. Usually, the valve plate is disconnected from the power contactor. When the cigarette is smoked, the valve plate is sucked away from air intake vents to connect the power contactor and the indicator gives out light.

In order to electrically heat the smoking material to promote evaporation, an electronic heater 15 can be set in the smoking material evaporation chamber. One electrode of the electronic heater is connected to the power supply battery with a wire, and the other electrode is connected to the power contactor 4. Considering that the electronic heater consumes much electricity, an external power supply 14 can be set above the outer casing of the cigarette holder to provide a backup for the battery

Another scheme is to heat the smoking material by using a chemical energy. In this scheme, the cigarette holder is structurally changed a little bit in the following way: An inner casing 10 is set in the outer casing 9 of the cigarette holder, with a mezzanine is reserved in between, a chemical substance (available in the market) which can be triggered by a metallic plate to give out heat is loaded in the mezzanine, the metallic triggering plate 13 is set in the mezzanine, a triggering plate button 12 is set on the outer casing, a filter tip 1 is set at the bottom of the outer casing, a smoking material evaporation chamber 2 is set above the filter tip, air intake vents 6 are set above the smoking material evaporation chamber, and a suction control valve plate 5 and a spring 3 are set between the smoking material evaporation chamber and the air intake vents. When smoking, the user presses down the triggering plate button, and the chemical substance in the mezzanine gives out heat so that the liquid cigarette in the smoking material evaporation chamber vaporizes and the gas which smells like cigarettes is sucked through the filter tip into the mouth.

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To increase the fun of smoking, as described previously, an indicator 8 can be set at the other end of the cigarette holder, a power supply battery 7 is installed under the indicator, one electrode of the power is connected to the indicator and the other electrode is connected to the valve plate 5, a power contactor 4 is set under the valve plate, and the power contactor is connected to the indicator with a wire.

The advantages of the present invention are as follows: The liquid odor cigarette is free of any poison, harm, or environment pollutions, and benefits people's health. In addition, the tip can give out light so that it is more real and have more fun.

Figure 1 is a cutaway view of the first design scheme of the cigarette holder.

Figure 2 is a cutaway view of the second design scheme of the cigarette holder.

Description of reference numbers in the drawings: 1. filter tip; 2. smoking material evaporation chamber; 3. spring; 4. power contactor; 5. valve plate; 6. air intake vent; 7. power supply battery; 8. indicator; 9 outer casing; 10. inner casing; 11. mezzanine; 12. button; 13 triggering plate; 14. external power supply, 15. electronic heater

Embodiment 1: 0.3 ml of pepper juice, 1 ml of carrot juice, 0.5 ml of ginger juice, 0.1 ml of wind medicated oil, and 0.1 ml of alcohol are mixed evenly.

Embodiment 2: A filter tip 1 is set at one end of the outer casing 9 of the cigarette holder, a smoking material evaporation chamber 2 is set above the filter tip, air intake vents 6 are set above the smoking material evaporation chamber, and a suction control valve plate 5 and a spring 3 are set between the smoking material evaporation chamber and the air intake vents.

Embodiment 3: After the preparations in embodiment 2 are completed, an indicator 8 is set at the other end of the cigarette holder, a power supply battery 7 is installed under the indicator, one electrode of the power is connected to the indicator and the other electrode is connected to the valve plate 5, a power contactor 4 is set under the valve plate, and the power contactor is connected to the indicator with a wire.

Embodiment 4: After the preparations in embodiment 3 are completed, an electronic heater 15 is set in the smoking material evaporation chamber, one electrode of the electronic heater is connected to the power supply battery with a wire, the other electrode is connected to the power contactor 4, and an external power supply 14 is set on the outer casing of the cigarette holder.

Embodiment 5: An inner casing 10 is set in the outer casing 9 of the cigarette holder, a mezzanine is set between the outer casing and the inner casing, a chemical substance which can be triggered by a metallic plate to give out heat is loaded in the mezzanine, the metallic triggering plate 13 is set in the mezzanine, a triggering plate button 12 is set on the outer casing, a filter tip 1 is set at the bottom of the outer casing, a smoking material evaporation chamber 2 is set above the filter tip, air intake vents [6] are set above the smoking material evaporation chamber, and a suction control valve plate 5 and a spring 3 are set between the smoking material evaporation chamber and the air intake vents.

Embodiment 6: After the preparations in embodiment 5 are completed, an indicator 8 is set at the other end of the cigarette holder, a power supply battery 7 is installed under the indicator, one electrode of the battery is connected to the indicator and the other electrode is connected to the valve plate 5, a power contactor 4 is set under the valve plate, and the power contactor is connected to the indicator with a wire.

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Drawings

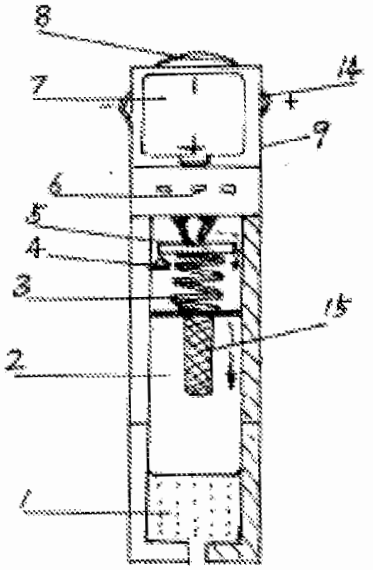


Figure 1

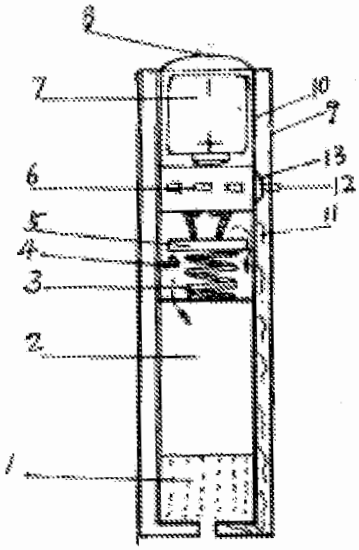


Figure 2

TRANSPERFECT

City of New York, State of New York, County of New York

I, Angela Lo, hereby certify that the document "CN1233436A" is, to the best of my knowledge and belief, a true and accurate translation from Chinese to English.

Angela Lo

Sworn to before me this
June 14, 2016

Signature, Notary Public

ALITASHA YOUNGER
Notary Public - State of New York
No. 01YO6335137
Qualified in KING County
Commission Expires Dec 28, 2019

Stamp, Notary Public

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[19]中华人民共和国国家知识产权局

[51]Int. Cl[6]
A24D 3/18

[12]发明专利申请公开说明书

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[43]公开日 1999年11月3日

[11]公开号 CN 1233436A

[22]申请日 98.4.27 [21]申请号 98108145.2

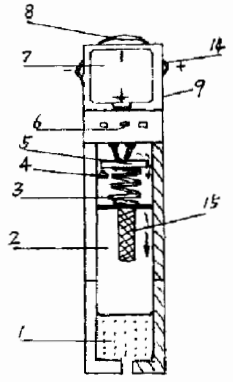
[71]申请人 高洪斌
地址 111300 辽宁省灯塔市邮电局关学寨
[72]发明人 高洪斌

权利要求书1页 说明书2页 附图页数1页

[54]发明名称 液体气味香烟

[57]摘要

液体气味香烟涉及一种香烟。它包括烟液及烟嘴，烟液由辣椒汁、胡萝卜汁、姜汁、风油精、酒精等配制而成；烟嘴包括外壳、过滤嘴、烟料蒸发室、进气孔、阀片、电源电池、指示灯、电子加热器等，还可以有内壳、夹层及能用金属片引发放热的化学物质等。优点是无毒无害，不污染环境，有益人体健康。



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权 利 要 求 书

1、液体气味香烟涉及一种香烟，其特征在于在烟咀外壳[9]的一端设过滤咀[1]，过滤咀的上方设烟料蒸发室[2]，烟料蒸发室的上方有进气孔[6]，在烟料蒸发室与进气孔之间设吸气控制阀片[5]和弹簧[3]。

2、按照权利要求 1 所说的液体气味香烟，其特征在于在烟咀外壳的另一端设指示灯[8]，指示灯下方装电源电池[7]，电源的一极与指示灯相接，另一极接在阀片[5]上，阀片的下方设电源接触器[4]；电源接触器通过导线与指示灯相连。

3、按照权利要求 2 所说的液体气味香烟，其特征在于在烟料蒸发室内设电子加热器[15]，电子加热器一极通过导线与电源电池相接，另一极与电源接触器[4]相接；另在烟咀外壳上设外接电源[14]。

4、液体气味香烟涉及一种香烟，其特征在于在烟咀外壳[9]的里面设内壳[10]，中间留有夹层，夹层内装能用金属片引发放热的化学物质，并设金属引发片[13]，在外壳上设引发片按钮[12]，外壳的下端设过滤咀[1]，过滤咀上方设烟料蒸发室[2]，烟料蒸发室的上方设进气孔[6]，在烟料蒸发室与进气孔之间设吸气控制阀片[5]和弹簧[3]。

5、按照权利要求 4 所说的液体气味香烟，其特征在于在烟咀外壳的另一端设指示灯[8]，指示灯下方设电源电池[7]，电源的一极与指示灯相接，另一极接在阀片[5]上，阀片的下方设电源接触器[4]，电源接触器通过导线与指示灯相连。

6、液体气味香烟涉及一种香烟，其特征在于取辣椒汁 0.3 毫升、胡萝卜汁 1 毫升、姜汁 0.5 毫升、风油精 0.1 毫升、酒精 0.1 毫升混匀。

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液体气味香烟

本 项发明 涉及一种香烟。

现有的香烟危害人体健康，污染环境，本人研制了一种无毒无害，不污染环境，而且有保健作用的烟液。

本 项发明 的目的是要设计一种无毒无害，不污染环境的液体气味香烟。

上述目的可以由下述方案来实现：

取辣椒汁 0.3 毫升、胡萝卜汁 1 毫升、姜汁 0.5 毫升、风油精 0.1 毫升、酒精 0.1 毫升，混匀即可。

对液体气味香烟的烟咀设计如下：在烟咀外壳 9 的一端设过滤咀 1，过滤咀的上方设烟料蒸发室 2，可蒸发的液体烟就装在这里，烟料蒸发室的上方有进气孔 6，在烟料蒸发室与进气孔之间设吸气控制阀片 5 和弹簧 3，不吸烟时阀片在弹簧的作用下紧贴在进气孔上，将其封闭，吸烟时阀片被吸开。

为了增加吸烟的趣味性，可以在烟咀的另一端设指示灯 8，指示灯下方装电源电池 7，电源的一极与指示灯相接，另一极接在阀片 5 上，阀片的下方设电源接触器 4，电源接触器通过导线与指示灯相连。平时阀片与电源接触器断开，吸烟时阀片被吸离开进气孔，与电源接触器接触导通，指示灯发光。

为了能用电给烟料加热促进蒸发，可在烟料蒸发室内设电子加热器 15，电子加热器一极通过导线与电源电池相接，另一极与电源接触器 4 相接；考虑到电子加热器用电较多，还可以在烟咀外壳上设外接电源 14，以便另备电池。

另一种方案，就是用化学能给烟料加热，在烟咀结构上作了一点改动，办法是：在烟咀外壳 9 的里面设内壳 10，中间留有夹层，夹层内装能用金属片引发放热的化学物质（市场有售），并设金属引发片 13，在外壳上设引发片按钮 12，外壳的下端设过滤咀 1，过滤咀上方设烟料蒸发室 2，烟料蒸发室的上方设进气孔 6，在烟料蒸发室与进气孔之间设吸气控制阀片 5 和弹簧 3。吸烟时按动引发片按钮，夹层中的化学物质发热，使烟料蒸发室中的液体烟蒸发，放出香烟味气体经过滤咀被吸入口中。

为了增加吸烟的趣味性，也可以和前边说的一样，在烟咀的另一端

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设指示灯 8，指示灯下方设电源电池 7，电源的一极与指示灯相接，另一极接在阀片 5 上，阀片的下方设电源接触器 4，电源接触器通过导线与指示灯相连。

本 项发明 的优点是无毒无害，不污染环境，对人体健康有利，而且烟头能发光，使之更逼真，更具趣味性。

图 1 是关于烟咀的第一种设计方案的剖面示意图；

图 2 是关于烟咀的第二种设计方案的剖面示意图。

图中：1. 过滤咀；2. 烟料蒸发室；3. 弹簧；4. 电源接触器；5. 阀片；6. 进气孔；7. 电源电池；8. 指示灯；9. 外壳；10. 内壳；11. 夹层；12. 按钮；13. 引发片；14. 外接电源；15. 电子加热器。

实施例一、取辣椒汁 0.3 毫升、胡萝卜汁 1 毫升、姜汁 0.5 毫升、风油精 0.1 毫升、酒精 0.1 毫升混匀。

例二、在烟咀外壳 9 的一端设过滤咀 1，过滤咀的上方设烟料蒸发室 2，烟料蒸发室的上方设进气孔 6，在烟料蒸发室与进气孔之间设吸气控制阀片 5 和弹簧 3。

例三、按照例二的作法完成之后再在烟咀的另一端设指示灯 8，指示灯下方装电源电池 7，电源的一极与指示灯相接，另一极接在阀片 5 上，阀片的下方设电源接触器 4，电源接触器通过导线与指示灯相连。

例四、按照例三的作法完成之后再在烟料蒸发室内设电子加热器 15，电子加热器一极通过导线与电源电池相接，另一极与电源接触器 4 相接，并在烟咀外壳上设外接电源 14。

例五、在烟咀外壳 9 的里面设内壳 10，中间设夹层，夹层内装能用金属片引发放热的化学物质，并设金属引发片 13，在外壳上设引发片按钮 12，外壳的下端设过滤咀 1，过滤咀上方设烟料蒸发室 2，烟料蒸发室的上方设进气孔 6，在烟料蒸发室与进气孔之间设吸气控制阀片 5 和弹簧 3。

例六、按照例五的作法完成之后再在烟咀的另一端设指示灯 8，指示灯下方装电源电池 7，电源的一极与指示灯相接，另一极接在阀片 5 上，阀片的下方设电源接触器 4，电源接触器通过导线与指示灯相连。

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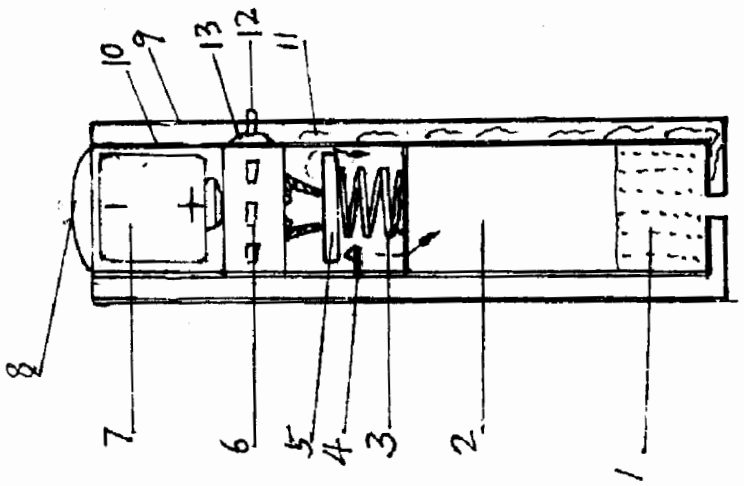


图2.

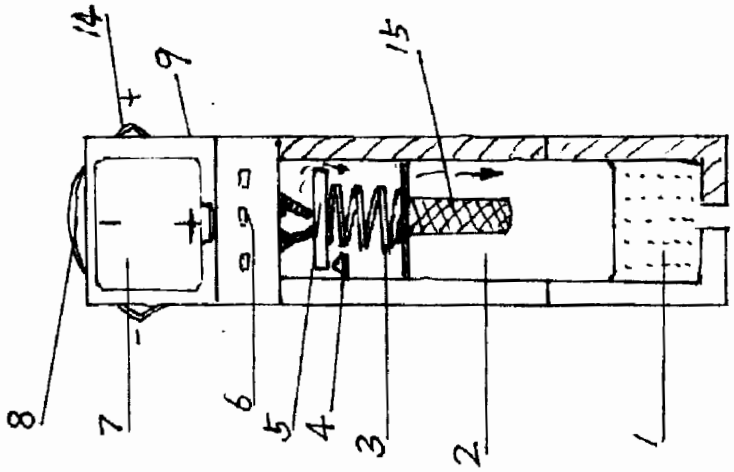


图1.

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Christine Drake 2/15/2018

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(54) Title: SYSTEM FOR SUPPLYING AN INHALABLE AEROSOL

(57) Abstract [see original]

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System for supplying an inhalable aerosol

The invention concerns a system for supplying an inhalable aerosol as well as the components of such a system. This system is suitable in particular as a smoking article for supplying smoke aerosol to smokers.

When conventional cigarettes are smoked, most of the tobacco is burned not during the puffing, but in the intermissions. This leads to the formation of so-called second-hand smoke, which is often felt to be a nuisance by nonsmokers.

To overcome this problem, many new smoking articles have been proposed in which no tobacco is burned during intermissions between puffs. A common principle of such developments is that it is not the heat of combustion of the tobacco, but rather other energy sources are used to release the smoke aerosol. In this way, not only is the formation of secondhand smoke largely prevented, but also thanks to a changed temperature control during the puffs a preferred release of aromatic substances can also be accomplished and the formation of irritating or unwanted by-products reduced. Often the proposed smoking articles for formation of an aerosol make use not of tobacco, but substitute materials such as special homogenized sheet tobaccos or substrates coated with aromatic substances.

Thus, there is known a cigarette-like smoking article in which the thermal energy of a glowing carbon element is transmitted to an aluminum capsule arranged inside the cigarette, containing an aerosol-forming material.

In a modification of this smoking article, the aerosol-forming material used is a special homogenized sheet tobacco coated with large amounts of glycerin.

What is common to both of the aforementioned smoking articles is that the combustion gases of the heating element are inhaled along with the smoke aerosol, which leads to an increased uptake of carbon monoxide by the smoker. The spatial separation of energy source and aerosol former results in a lack of flavor during the first puffs on account of the difficult heat transfer. Furthermore, the entire smoking article, which unlike conventional cigarettes retains its length, must be disposed of after being smoked. This leads to a substantial accrual of complex residual materials and associated disposal problems.

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Another known smoking article works by a different principle. Here, a cigarette-shaped article with filter and tobacco component at the tobacco end is inserted into an electronically controlled smoking device. In the smoking device, thanks to electrical heating elements, the tobacco-containing portion is heated at radially successive places with the puffs. This principle requires a complicated design of the smoking device, which has to be outfitted with several heating elements and a complicated electronic control unit. The manipulating of such a device is cumbersome on account of its size and shape and differs considerably from that of a conventional cigarette.

The problem which is solved by the present invention is to create a system for supplying of an inhalable aerosol, which has a simple basic layout and in particular can serve as a smoking article offering a similar taste experience to traditional cigarettes, yet whose use does not generate any secondhand smoke during the puffs.

This problem is solved by a system with the features of claim 1, having an inhalation device with the features of claim 33 and a substrate portion with the features of claim 35 and can have a mouthpiece with the features of claim 39. Advantageous configurations of the invention appear in the dependent claims.

The system according to the invention for supplying an inhalable aerosol is especially suited to smoking articles whose mode of operation is based on the heating of an aerosol-forming material during puffs. A preferably cylindrical substrate portion, which has at least one heating resistor and contains aerosol-forming material inside a sheath, is smoked in a special, preferably cigar or cigarette-shaped inhalation device. The heating resistor is preferably the sheath of the substrate portion, which is electrically conductive for this purpose, at least for part of its length. The substrate portion is heated in the inhalation device during puffs by supplying electric energy to the conductive sheath, so that aerosol is formed, which can be taken up by the smoker by drawing air through the air inlet opening of the sheath and across the aerosol outlet opening of the sheath. Thanks to the use of the smoking article, the formation of secondhand smoke during the pauses between puffs is prevented.

The basic principle of the invention thus relies on the closest possible physical arrangement of heat source and aerosol former.

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This is accomplished in that the substrate portion itself has the heating resistor (or also several heating resistors), which is preferably configured as a conductive sheath of the substrate portion and is heated by applying a voltage across the contacts in the inhalation device.

As compared to the aforementioned known smoking articles, the system according to the invention has the advantage that despite a simple design no combustion gases are inhaled and the residues remaining after use can be disposed of in an environmentally compatible manner.

The invention shall be explained below with the help of sample embodiments. The drawings show

Fig. 1a, a perspective view of a substrate portion according to the invention,

Fig. 1b, a longitudinal section through the substrate portion of Fig. 1a,

Fig. 1c, a transverse section through the substrate portion of Fig. 1a,

Fig. 2a, a longitudinal section through another sample embodiment of a substrate portion according to the invention, having an integrated mouthpiece,

Fig. 2b, a perspective view of a sample embodiment of a substrate portion, in which a number of zones of electrical conductivity are provided spaced in the circumferential direction.

Fig. 2c, a perspective view of a sample embodiment of a substrate portion, in which a number of axially spaced zones of electrical conductivity are provided in the circumferential direction,

Fig. 3, a schematic longitudinal section through an inhalation device according to the invention, in which the substrate portion per Fig. 2a is used and which has a separate housing for control components and power supply,

Fig. 4a, a schematic longitudinal section through another sample embodiment of an inhalation device according to the invention, which is designed for the use of a separate mouthpiece and which has a separate housing for control components and power supply, with installed substrate portion and installed mouthpiece,

Fig. 4b, an illustration of the use of the system according to Fig. 4a by a smoker, and

Fig. 5, a schematic longitudinal section through another sample embodiment of an inhalation device according to the invention, which is designed for the use of a separate mouthpiece and in which the power supply is located in the housing, with installed substrate portion and installed mouthpiece.

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A preferred sample embodiment of a substrate portion 1 is represented in figures 1a to 1c. The substrate portion 1 in the sample embodiment has a cylindrical shape, as can be seen in Fig. 1a to 1c. It contains an aerosol-forming material 2, which is surrounded by a radially arranged (i.e., on the cylindrical envelope) electrically conductive sheath 3.

The aerosol-forming material 2 can consist, for example, of cut lamina tobacco, cut tobacco stems, reconstituted tobacco, or a substrate material coated with aromatic substances. The use of cut lamina and stem can also be done in expanded form, such as is obtained for example by the use of the method described in the patents DE 29 03 300, DE 31 19 330 and DE 34 14 625. As substrate materials for the aromatic substances, one can use both organic materials such as paper and inorganic ones, such as silica gel. Any given mixtures of the mentioned components can also be used.

In the preferred sample embodiment, the material 2 contains a fraction of around 3% to 30% of a volatile polyol, such as glycerin or propylene glycol, in order to intensify the aerosol formation. Another way of intensifying the aerosol formation is the use of aerosol-forming material with a moisture content above the equilibrium moisture content. Thus, e.g., one can use tobacco whose equilibrium moisture content is around 10% to 12%, with a moisture content of 20%. In this case, a suitable packaging will ensure that no moisture loss occurs prior to use.

The electrically conductive sheath 3 can consist of paper provided with conductive additives (such as metals or graphite/carbon) or homogenized sheet tobacco or a plastic film made conductive likewise by additives. A multilayered sheath can also be used, while the inner layer can consist of paper or homogenized sheet tobacco and the outer layer of one of the mentioned conductive materials.

It is likewise possible to form the sheath first from a nonconductive material and then to put in place a conductive film before or after ensheathing the aerosol-forming material, e.g., by vapor deposition or spraying.

The production of substrate portions 1 can occur in simple manner on a traditional continuous cigarette making machine: at first, an endless strand of tobacco or substitute material is formed in a format section; this is surrounded by the conductive sheath material, supplied in the direction of manufacture from a reel, and glued along a seam. After this, the product is cut to length in the desired dimensions. A further option of manufacture is the extrusion of a suitable aerosol-forming material through a circular nozzle with subsequent ensheathing and cutting of the extruded product to length.

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Preferably, the diameter of a substrate portion 1 is in the range of 5 mm to 12 mm and the length in the range of 10 mm to 100 mm. Especially preferable are diameters of 5 mm to 10 mm and lengths of 15 mm to 60 ram.

In one preferred sample embodiment, the substrate portion 1, as shown in Fig. 2a, is connected by a common sheath 11 to a mouthpiece 10. The manufacturing of such a connection is familiar to the person skilled in the manufacture of filter cigarettes. The substrate portion 1 can additionally have a higher electrical conductivity in zones 12 as compared to the rest of the sheath, such as can be accomplished e.g. by winding it with metal foil in the zones 12, in order to improve the electrical contact with the contacts in an inhalation device (see below).

Whereas in the sample embodiment of the substrate portion per Fig. 2a the substrate portion is designed as a single cohesive heating resistor, other sample embodiments of the substrate portion call for a segmented or sectionwise distribution of the electric conductivity of the sheath. This can be done as represented in Figure 2b or as in Fig. 2c, for example.

The sheath of the substrate portion per Figure 2b has a number of annular zones 13 with relatively high electric conductivity, every two neighboring zones 13 being separated by an insulating zone. Each of the zones 13 forms a separate heating resistor, which can be individually provided with power across appropriate contacts in the inhalation device on an inhalation device adapted to the substrate portion. The position of such contacts is indicated in Fig. 2b by arrows as well as the polarities "+" and "-". In one variant of this sample embodiment, the individual zones 13 do not run along the entire periphery of the substrate portion, but instead have each time an insulating interruption. In another variant, the zones 13 are merged in electrically conducting manner in a zone extending along the substrate portion, for example, one running along the contact sites "-" (or the "+" contact sites) per Fig. 2b, so that only one contact need be present in the inhalation device for this pole, as a kind of ground connection.

In the sample embodiment of a substrate portion shown in Fig. 2c, the sheath of the substrate portion has a number of electrically conductive zones 15 insulated against each other and staggered in the circumferential direction. The zones 15 serving as separate heating resistors extend over the length of the substrate portion. In an end region of the substrate portion, they are merged in electrically conducting manner by a ring-shaped contact zone 14, where the electrical resistance of the contact zone 14 is preferably less than that of a zone 15.

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At this end, in an inhalation device adapted to the substrate portion, only one "-" contact is required, while at the other end a number of contacts are provided, being shown by arrows in Fig. 2c and designated with "+". The "+" contacts enable a separate actuating of the zones 15. In order to ensure the required orientation of the substrate portion in the inhalation device in a defined angular position, a positioning feature is provided in the sample embodiment in the form of a notch 16, which engages with a corresponding guide shoulder on the inhalation device when the substrate portion is introduced into the inhalation device.

A sample embodiment of an inhalation device (called hereinafter a smoking device) shall be described below with the aid of Fig. 3. This smoking device is designed for use with a substrate portion per Fig. 2a.

As shown by Fig. 3, two contacts (electrodes) 21 and 22 are situated in a housing 20, by which the contact with the conductive sheath of a substrate portion contained in the smoking device is produced. The cavity inside the housing 20 and the contacts 21 and 22 form a receiving mechanism to hold the substrate portion. Through an opening 24, air can be drawn through the substrate portion. By an electrical connection 25, the contact 21 is connected directly to a power supply unit 30 arranged in a separate housing. The connection to the contact 22 runs across a switch 23, by which the circuit can be closed. The power supply unit 30 contains a battery or a storage battery 31 and also optionally a control unit 32. In the case of a storage battery, this can be charged across plug contacts 33.

The smoking device is used as follows: the smoking device is joined to the power supply unit 30 by a cord (connection 25) (also see Fig. 4b). The substrate portion 1 provided with the mouthpiece 10 is shoved into a conically configured opening at one end face of the housing 20, until it stops against the contact 21, see Figure 3. The smoking device is now placed in one's mouth and the switch 23 is operated. By closing the circuit, the substrate portion is heated by the current flowing across the contacts 21 and 22 through the sheath acting as heating resistor, and the resulting aerosol can be removed through the mouthpiece 10. Disconnection is done by releasing the switch 23 or by the control unit 32. In this way, several puffs can be taken. After use, the substrate portion 1 with the mouthpiece 10 is removed from the smoking device and disposed of. From time to time a battery replacement or charging of the storage battery 31 in the power supply unit 30 is necessary.

Figure 4a shows another sample embodiment of the system, differing from the preceding one in that mouthpiece 10' and substrate portion 1' are not joined together. The mouthpiece 10' is inserted into a base 42, and after the substrate portion 1' is inserted into a smoking device having a housing 40, this is screwed together with the housing 40. The base 42 serves at the same time as a contact.

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The function and use of this smoking device and the other components of the system otherwise correspond to the previous sample embodiment. In Figure 4a the second contact is designated as 41, the switch as 43, the opening for the air intake as 44, the connection cord as 45, the power supply unit as 30', the battery or the storage battery as 31', the control unit as 32' and the plug contacts as 33'.

The use of the smoking article is shown in Figure 4b. The smoking device with mouthpiece and substrate portion can be handled like a traditional cigarette; the power supply unit is preferably carried in a breast pocket, a belt holder, or the like. The two parts are joined together by a highly flexible cord (connection cord 45) of sufficient length.

A single-piece sample embodiment of the smoking device with cigarette shape is shown in Figure 5. A housing 50 has at the front end a screw-off cap 53, by which it is possible to replace a battery or a storage battery 51. A swiveling flap 52, which is also drawn in the swiveled open state, serves to insert a substrate portion 1". When the flap 52 is opened, at the same time a rod, not shown, moves a receiving section 55 backward against the force of a helical spring 56 in order to facilitate the inserting of the substrate portion 1". The force of the helical spring 56 acting when the flap 52 is closed produces a fixation of the substrate portion 1" between a contact 57 and the receiving section 55, which serves at the same time as a mating contact. By closing a switch 60, current flows between the contacts 55, 57 across the conductive sheath of the substrate portion 1", so that this becomes heated. The smoke aerosol can be removed by puffing on a mouthpiece 10" inserted into the receiving section 55, being configured as a separate component and not connected permanently to the substrate portion 1" in this sample embodiment. Air flows through a channel 54 and enters the substrate portion 1" at its front end.

In a smoking device which is designed for use of a substrate portion per Fig. 2b or per Fig. 2c, there are contacts coordinated in pairs with a zone 13 or 15 serving as a heating resistor. If, as described above, a common pole is provided in electrically conducting manner, only one contact needs to be present for this. By a sequential power supply each time to a zone 13 or 15, a new piece of the substrate portion can be heated each time, which ensures a more uniform aerosol output through the puffs. This produces a largely constant flavor output per puff. The control can occur through a puff detector, for example, which responds to the change in pressure when the user draws in air and supplies power to one of the zones 13 or 15 through a switching mechanism. During the next puff, the switching mechanism responds once more, but this time an electronic circuit ensures that the heating current is applied across the coordinated contacts to a different, not yet used zone 13 or 15, and so on.

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For the design of the mouthpiece 10, 10' or 10", basically all principles familiar to the specialist in the cigarette industry can be used. In the most simple case, the mouthpiece consists of a hollow roll of paper or carton. Preferable, however, is a design as a filter mouthpiece. In this case, a filter material such as cellulose acetate, polypropylene or paper is provided with a single or multiple layered sheath. One can also use a design corresponding to the known multiple filters, in which several segments with different properties are arranged in succession in the axial direction and joined by an outer sheath. In this case, one or more segments can be provided with axial boreholes. In all mentioned designs, furthermore, it is possible to use a zone-perforated sheath or a subsequent perforation of the sheath, for example, by laser beam. In this way, the smoke can be diluted by intake of outside air during the puffs.

Further variants of the system or its components will emerge directly from the claims.

In what follows, a further example is given for a substrate portion with mouthpiece and its use in the system.

Example

An American-Blend tobacco mixture with content

30% Burley tobacco
40% expanded Virginia tobacco
20% nonexpanded Virginia tobacco, and
10% Turkish tobacco

was conditioned and sprayed with 12 wt.-% of an aqueous casing with a glycerin content of 80 wt.-%. Next, the tobacco was cut with a cut width of 0.8 mm and dried to a moisture content of 12%. 180 kg of this cut tobacco was blended with 20 kg of expanded stem cut.

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This blend was used to produce an endless strand with a diameter of 6 mm and a **packing** density of 200 mg/ml on a continuous cigarette making machine. As the sheath material, air-impermeable paper made conductive by addition of graphite was used. The endless strand was cut into individual portions of 40 mm length, and these were connected to an acetate filter plug in familiar fashion by a mouthpiece joining paper.

The substrate portion so obtained was smoked in a smoking device per Figure 3, without producing any visible amounts of secondhand smoke. The flavor was judged by taste testers as being uniform and equivalent to a that of traditional cigarettes.

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Patent claims

1. System for supplying an inhalable aerosol, with
   - a substrate portion (1; 1'; 1") , having at least one heating resistor (3; 13; 15) and containing aerosol-forming material (2) inside a sheath (3), wherein the sheath (3) has an air inlet opening and an aerosol outlet opening, and
   - an inhalation device, having a housing (20; 40; 50), a receiving section to hold the substrate portion (1; 1'; 1") and contacts (21, 22; 41, 42; 55, 57) in contact or able to be brought into contact with a voltage source (31; 31'; 51) for supply of electric power to the at least one heating resistor (3; 13; 15) of the substrate portion (1; 1'; 1").

2. System according to claim 1, characterized by a mouthpiece (10; 10'; 10"), which can be connected separately (10'; 10") to the inhalation device or which is connected to the substrate portion (1) and in the operating state stands in communication with the aerosol outlet opening of the substrate portion (1; 1'; 1").

3. System according to claim 1 or 2, characterized in that the sheath (3) of the substrate portion (1; 1'; 1") is electrically conductive at least in sections and is designed as at least one heating resistor (3; 13; 15).

4. System according to claim 3, characterized in that the sheath (3) of the substrate portion is designed as a single cohesive heating resistor.

5. System according to claim 3, characterized in that the substrate portion has a longitudinal axis and the sheath of the substrate portion has a number of axially staggered and mutually insulated heating resistors (13), which are merged in electrically conducting manner preferably in a zone extending along the substrate portion.

6. System according to claim 3, characterized in that the substrate portion has a longitudinal axis and the sheath of the substrate portion has a number of heating resistors (15) staggered in the circumferential direction and insulated from each other, which extend preferably along the length of the substrate portion and which are preferably merged in electrically conducting manner in an end region (14) of the substrate portion, while the substrate portion preferably has a positioning feature (16) adapted to the inhalation device for inserting into the inhalation device in a defined angular position.

7. System according to one of claims 3 to 6, characterized in that the sheath (3) of the substrate portion (1; 1'; 1") has metal foil, metal-coated or metal-containing paper, carbon containing paper, graphite-containing paper, an electrically conductive film, plastic film provided with conductive additives and/or homogenized sheet tobacco provided with conductive additives.

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8. System according to one of claims 3 to 7, characterized in that the sheath (3) of the substrate portion (1; 1'; 1") has several layers of sheath materials, wherein the outer layer has electrically conductive material and the inner layer consists preferably of paper or homogenized sheet tobacco.

9. System according to one of claims 3 to 8, characterized in that the sheath (3) of the substrate portion (1; 1'; 1") in the region between the contact sites to the two contacts (21, 22; 41, 42; 55, 57) of the inhalation device coordinated with a heating resistor (3; 13; 15) has an electrical resistance of 0.1 Ohm to 1000 Ohm.

10. System according to one of claims 3 to 9, characterized in that the zones (12) of the sheath (3) of the substrate portion (1) which can be brought into contact with the contacts (21, 22; 41, 42; 55, 57) of the inhalation device have an increased electrical conductivity as compared to the other material of the sheath (3), preferably by means of a metal coating.

11. System according to one of claims 1 to 10, characterized in that the substrate portion (1; 1'; 1") has a cylindrical shape with a length of 10 mm to 100 mm, preferably 15 mm to 60 mm, and a diameter of 4 mm to 12 mm, preferably 5 mm to 10 mm.

12. System according to one of claims 3 to 10 and according to claim 11, characterized in that the at least sectionwise electrically conductive sheath (3) of the substrate portion (1; 1' ; 1") is arranged as a cylindrical envelope and the end faces of the cylinder are designed as an air inlet opening and an aerosol outlet opening.

13. System according to one of claims 1 to 12, characterized in that the aerosol-forming material (2) of the substrate portion (1; 1'; 1") has cut tobacco, cut tobacco stems, homogenized sheet tobacco cut and/or an extruded tobacco material.

14. System according to one of claims 1 to 13, characterized in that the aerosol-forming material (2) of the substrate portion (1; 1'; 1") has a substrate material coated with aromatic substances.

15. System according to one of claims 1 to 14, characterized in that the aerosol-forming material (2) of the substrate portion (1; 1'; 1") contains an evaporable polyol, preferably glycerin or propylene glycol, in a fraction of 5 wt.-% to 50 wt.-%, preferably 10 wt.-% to 30 wt.-%.

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16. System according to one of claims 1 to 15, characterized in that the inhalation device has at least one switch (23; 43; 60) for the at least one heating resistor (3; 13; 15).

17. System according to one of claims 1 to 16, characterized in that the inhalation device has a puff detector, which together with a switching mechanism is designed to switch the circuit leading through a heating resistor (3; 13; 15) of the substrate portion (1; 1' ; 1") in dependence on the flow rate directed toward the air inlet opening of the substrate portion (1; 1'; 1").

18. System according to one of claims 1 to 17, characterized in that the inhalation device has a circuit, preferably an electronic circuit (32; 32'), for controlling the power put out by the at least one heating resistor (3; 13; 15) of the substrate portion (1; 1'; 1").

19. System according to claim 18 in conjunction with claim 4, characterized in that the circuit (32; 32') of the inhalation device is designed to control the voltage or the current for the heating resistor (3) of the substrate portion (1; 1'; 1") so that the heating power upon the first puff is set to a higher value than for the other puffs, and also to interrupt the power supply after a defined puffing time in order to avoid an overheating.

20. System according to claim 18 in conjunction with claim 5 or 6, characterized in that the circuit (32; 32') of the inhalation device is designed to sequentially activate the contacts coordinated with the individual heating resistors (13; 15) to sequentially turn on the individual heating resistors (13; 15).

21. System according to one of claims 18 to 20, characterized in that the circuit is accommodated inside the housing of the inhalation device.

22. System according to one of claims 18 to 20, characterized in that the circuit (32; 32') is accommodated in a separate housing (30; 30'), which is connected or can be connected to the housing (20; 40) of the inhalation device via a cord (25; 45).

23. System according to one of claims 1 to 22, characterized in that a battery or a storage battery (31; 31'; 51) is provided for the power supply to the contacts (21, 22; 41, 42; 55, 57) of the inhalation device, which is accommodated or can be accommodated in the housing (50) of the inhalation device or in a separate housing (30; 30').

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24. System according to one of claims 1 to 23, characterized in that the housing (50) of the inhalation device has the shape of a cigar.

25. System according to one of claims 1 to 23, characterized in that the housing (20; 40) of the inhalation device has the shape of a cigarette.

26. System according to one of claims 2 to 25 in conjunction with claim 2, characterized in that the mouthpiece (10; 10'; 10") has a length of 10 mm to 50 mm and a diameter of 4 mm to 12 mm.

27. System according to one of claims 2 to 26 in conjunction with claim 2, characterized in that the mouthpiece (10; 10'; 10") has a hollow sleeve of paper or carton.

28. System according to one of claims 2 to 26 in conjunction with claim 2, characterized in that the mouthpiece (10; 10'; 10") is configured as a filter mouthpiece, where the filter material has preferably cellulose acetate, paper, myria and/or polypropylene with a single or multiple layer paper sheath.

29. System according to claim 28, characterized in that the mouthpiece (10; 10'; 10") has a filter plug of several partial elements arranged in succession in the axial direction, one or more of which preferably have axial boreholes.

30. System according to one of claims 2 to 29 in conjunction with claim 2, characterized in that the mouthpiece (10; 10'; 10") has one or more perforation zones.

31. System according to one of claims 2 to 30 in conjunction with claim 2, characterized in that the substrate portion (1) and the mouthpiece (10) have a similar diameter and are joined together.

32. System according to claim 31, characterized in that the substrate portion (1) and mouthpiece (10) are connected by a common wrapping (11) with a mouthpiece joining paper.

33. Inhalation device, with a housing (20; 40; 50), with a receiving section for holding a substrate portion (1; 1'; 1") having an aerosol-forming material, and with contacts (21, 22; 41, 42; 55, 57) connected to or able to be connected to a voltage source (31; 31'; 51) for the supplying of electric power to at least one heating resistor of the substrate portion (1; 1'; 1").

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34. Inhalation device according to claim 33, characterized by features of the inhalation device from one of claims 16 to 25.

35. Substrate portion, which is designed for use with an inhalation device according to claim 33 or 34 and having at least one heating resistor (3; 13; 15) and containing aerosol-forming material (2) inside a sheath (3), wherein the sheath (3) has an air inlet opening and an aerosol outlet opening.

36. Substrate portion according to claim 35, characterized by features of the substrate portion (1; 1' ; 1") from one of claims 3 to 15.

37. Substrate portion according to claim 35 or 36, characterized by a mouthpiece (10), which is connected to the substrate portion (1) and stands in communication with the aerosol outlet opening of the substrate portion (1).

38. Substrate portion according to claim 37, characterized, in that the mouthpiece (10; 10'; 10") has features from one of claims 26 to 32.

39. Mouthpiece, which is designed for use with an inhalation device according to claim 33 or 34, can be connected separately (10'; 10") to the inhalation device and in the operating state stands in communication with the aerosol outlet opening of the substrate portion (1'; 1").

40. Mouthpiece according to claim 39, characterized by features of the mouthpiece (10'; 10") from one of claims 26 to 30.

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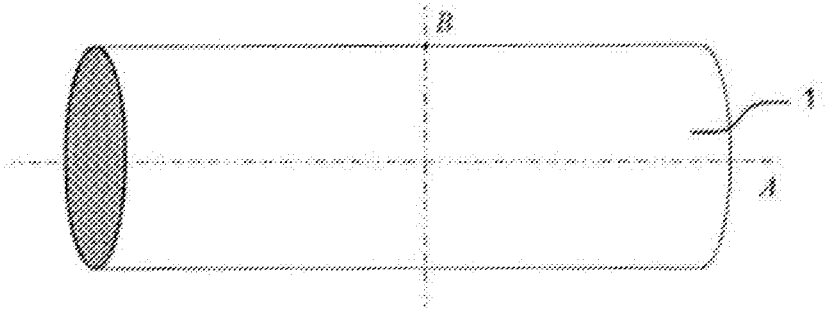


Fig. 1a

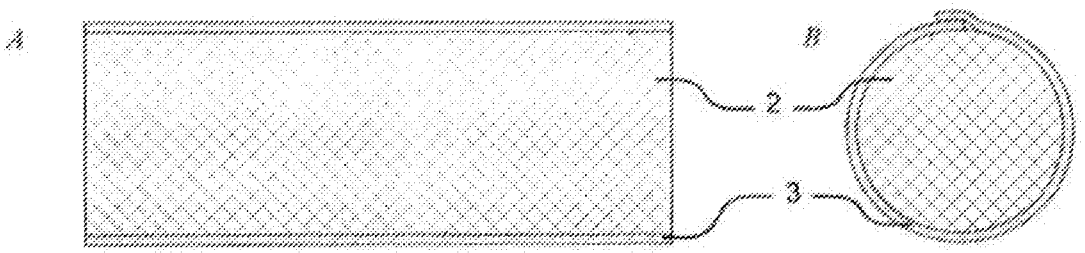
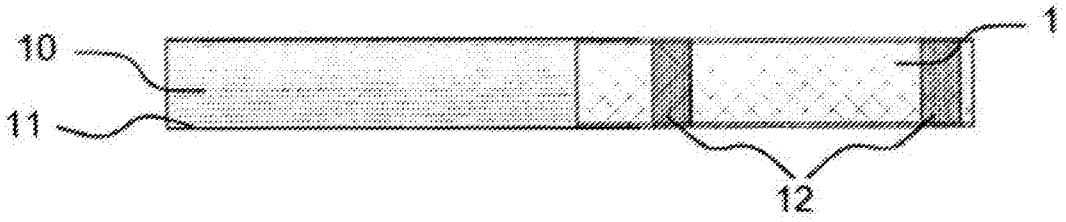


Fig. 1b

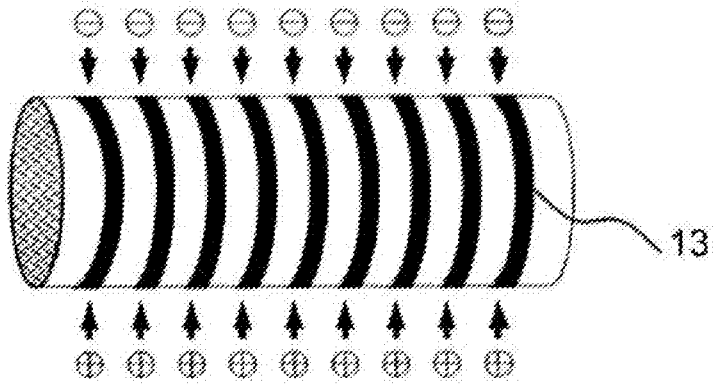
Fig. 1c

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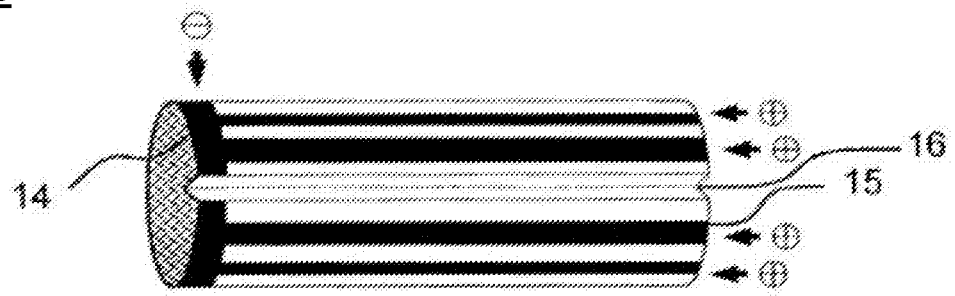
Figures. 2 a



Figures. 2b

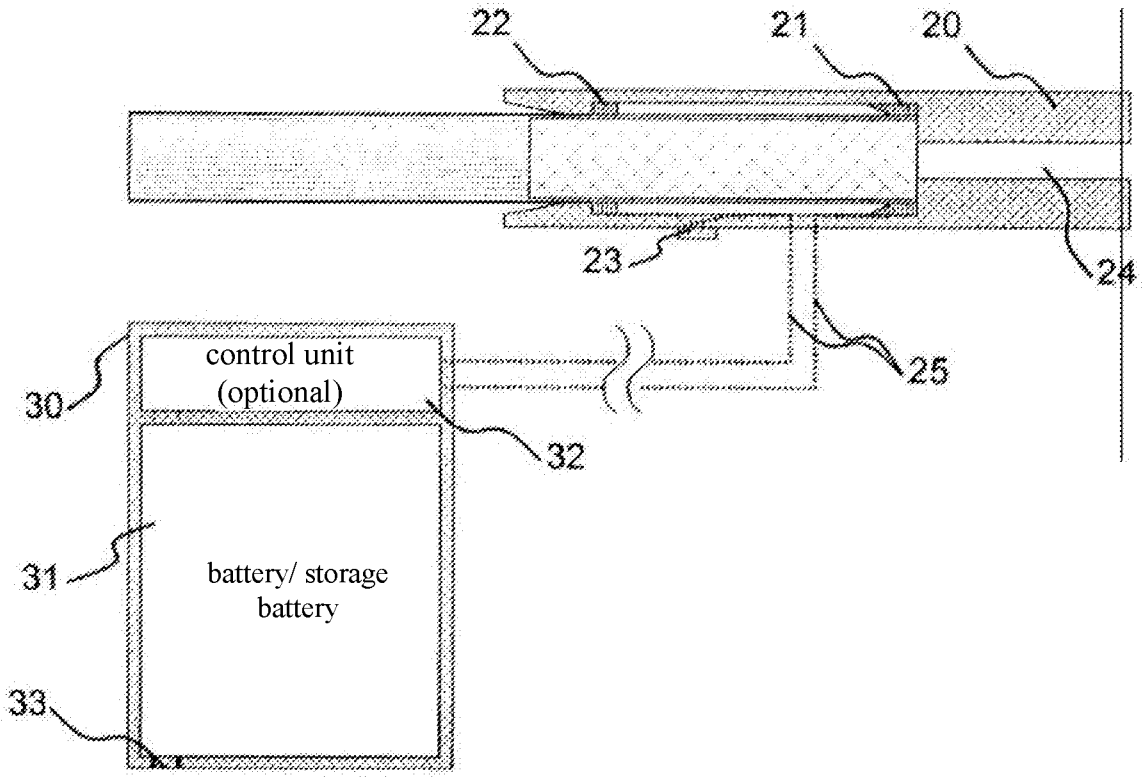


Figures. 2c



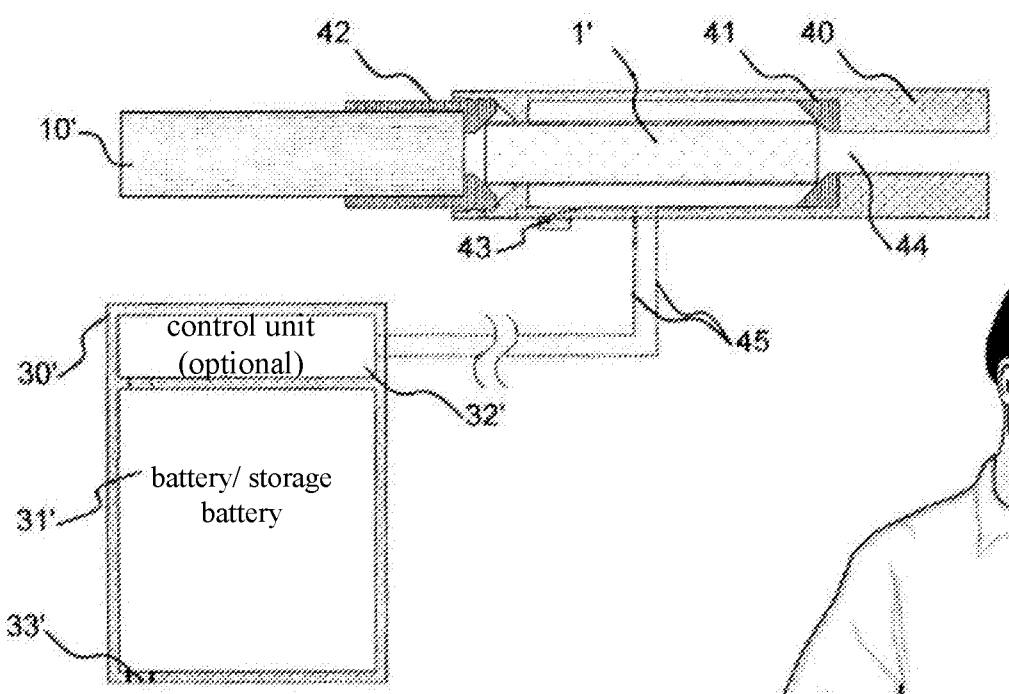
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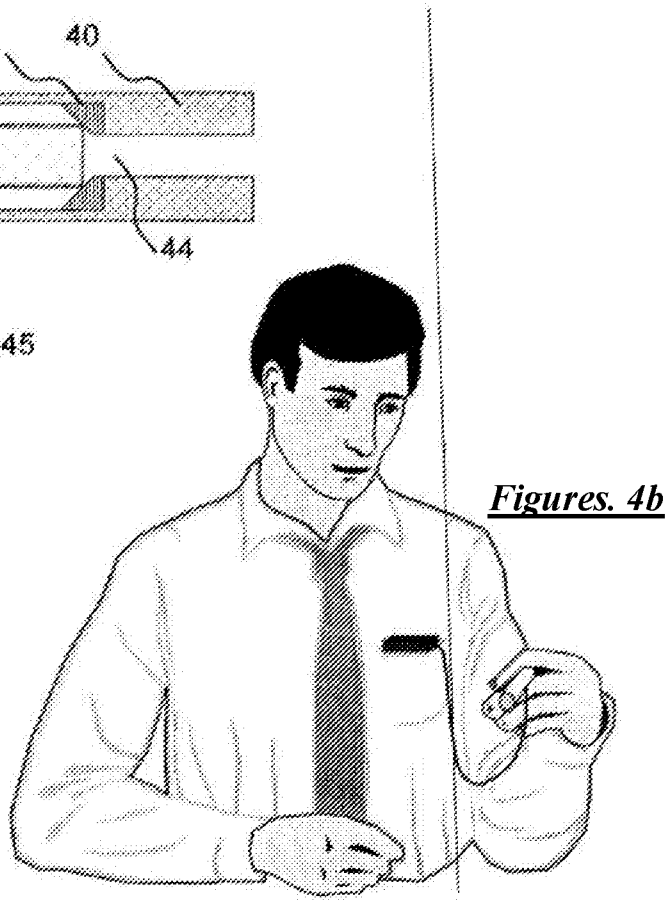
Figures. 3



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Figures. 4a

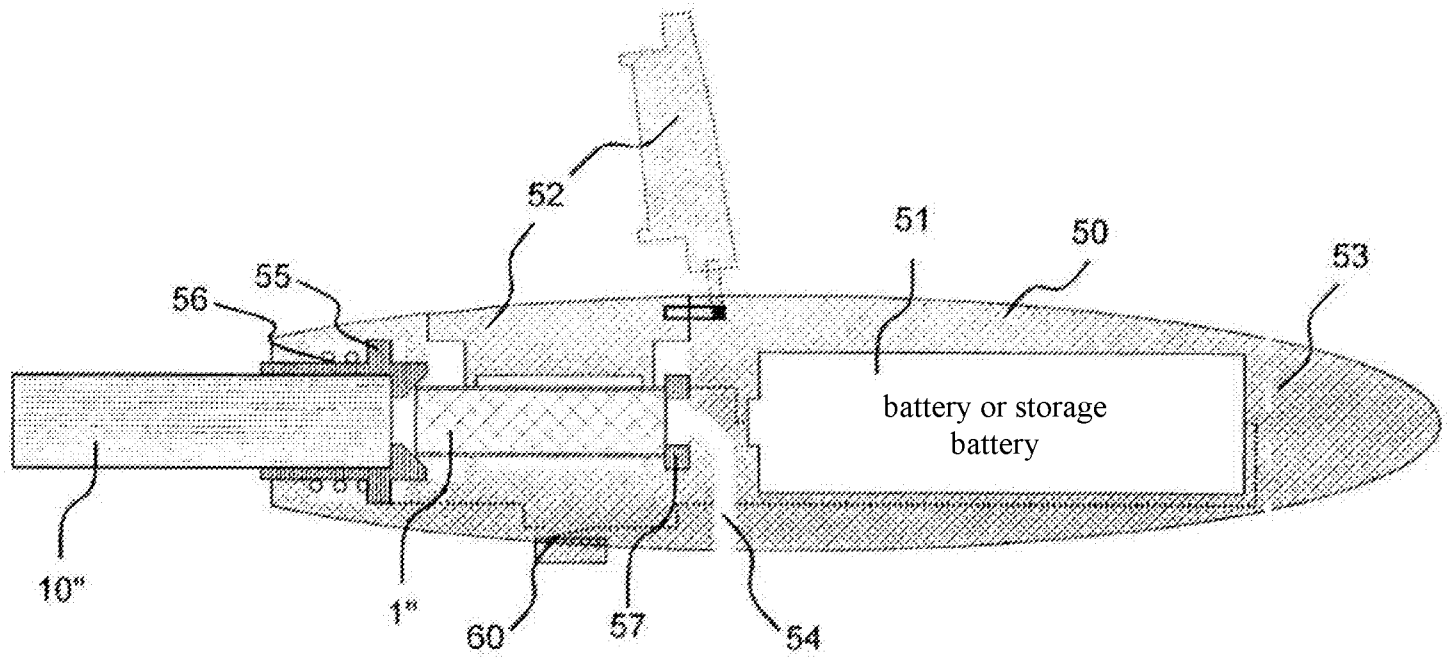




Figures. 4b

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Figures. 5



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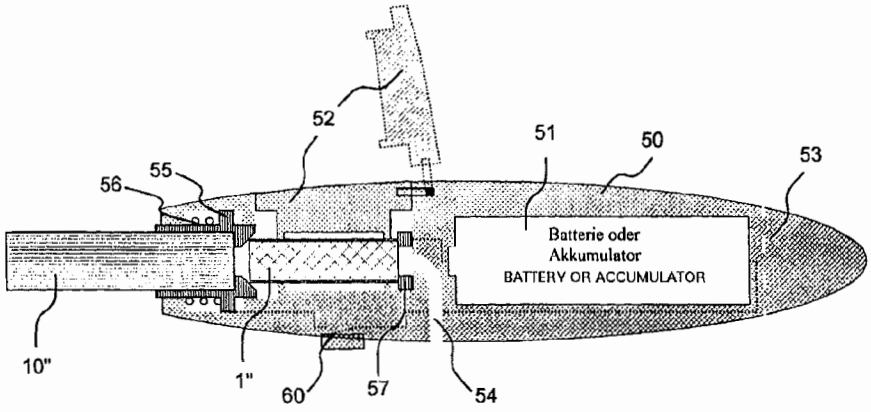
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(81) **Bestimmungsstaaten:** AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO Patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), eurasisches Patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), europäisches Patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI Patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Veröffentlicht
Mit internationalem Recherchenbericht.

(54) **Title:** SYSTEM FOR SUPPLYING AN INHALABLE AEROSOL

(54) **Bezeichnung:** SYSTEM ZUR BEREITSTELLUNG EINES INHALIERBAREN AEROSOLS



(57) **Abstract**

A system for supplying an inhalable aerosol contains a substrate portion (1") and an inhaling device. The substrate portion (1") has at least one heat resistor and contains an aerosol–forming material inside a casing which has an air inlet and an aerosol outlet. The casing of the substrate portion (1") is preferably electroconductive at least in sections and forms the at least one heat resistor. The inhaling device has a housing (50), a receiving device for holding the substrate portion (1") and contacts (55, 57) which are or can be connected to a voltage source (51) for supplying electrical power to the at least one heat resistor of the substrate portion (1").

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(57) Zusammenfassung

Ein System zur Bereitstellung eines inhalierbaren Aerosols enthält eine Substratportion (1") und eine Inhaliervorrichtung. Die Substratportion (1") weist mindestens einen Heizwiderstand auf und enthält innerhalb einer Umhüllung aerosolbildendes Material, wobei die Umhüllung eine Lufteintrifttsöffnung und eine Aerosolaustrittsöffnung hat. Dabei ist vorzugsweise die Umhüllung der Substratportion (1") zumindest abschnittsweise elektrisch leitfähig und bildet den mindestens einen Heizwiderstand. Die Inhaliervorrichtung hat ein Gehäuse (50), eine Aufnahmeeinrichtung zum Halten der Substratportion (1") und mit einer Spannungsquelle (51) in Verbindung stehende oder in Verbindung bringbare Kontakte (55, 57) zum Zuführen von elektrischer Leistung zu dem mindestens einen Heizwiderstand der Substratportion (1").

LEDIGLICH ZUR INFORMATION

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System zur Bereitstellung eines inhalierbaren Aerosols

Die Erfindung betrifft ein System zur Bereitstellung eines inhalierbaren Aerosols sowie die Komponenten eines derartigen Systems. Dieses System ist insbesondere als Rauchartikel zur Bereitstellung von Rauchaerosol für Raucher geeignet.

Beim Abrauchen konventioneller Cigaretten wird der größte Teil des Tabaks nicht während der Züge, sondern in den Zugpausen verbrannt. Dies führt zur Bildung des sogenannten Nebenstromrauchs, der von Nichtrauchern oft als belästigend empfunden wird.

Zur Überwindung dieses Problems sind zahlreiche neue Rauchartikel, in denen während der Zugpausen kein Tabak verbrannt wird, vorgeschlagen worden. Ein gemeinsames Prinzip solcher Entwicklungen ist, daß nicht die Verbrennungswärme des Tabaks, sondern andere Energiequellen zur Freisetzung des Rauchaerosols genutzt werden. Hierdurch wird nicht nur die Entstehung von Nebenstromrauch weitgehend vermieden, sondern durch eine geänderte Temperaturführung während der Züge kann auch eine bevorzugte Freisetzung von Aromasubstanzen erreicht und die Bildung von reizenden oder unerwünschten Nebenprodukten reduziert werden. Häufig kommen in den vorgeschlagenen Rauchartikeln zur Aerosolbildung statt Tabak Ersatzmaterialien wie spezielle Folientabake oder mit Aromasubstanzen beaufschlagte Trägermaterialien zur Anwendung.

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So ist ein cigarettenförmiger Rauchartikel bekannt, bei dem die Wärmeenergie eines glimmenden Kohleelements auf eine in Innern der Cigarette angeordnete Aluminiumkapsel übertragen wird, die ein aerosolbildendes Material enthält.

Bei einer Modifikation dieses Rauchartikels kommt als aerosolbildendes Material ein spezieller, mit hohen Mengen an Glycerin beaufschlagter Folientabak zum Einsatz.

Beiden vorgenannten Rauchartikeln ist gemeinsam, daß die Verbrennungsgase des Heizelements mit dem Rauchaerosol inhaliert werden, was zu einer erhöhten Aufnahme von Kohlenmonoxid durch den Raucher führt. Die räumliche Trennung von Energiequelle und Aerosolbildner führt aufgrund der schwierigen Wärmeübertragung zu einem Geschmacksdefizit bei den ersten Zügen. Weiterhin muß der gesamte Rauchartikel, der im Gegensatz zu herkömmlichen Cigaretten seine Länge beibehält, nach dem Abrauchen entsorgt werden. Dies führt zu einem erhöhten Anfall komplex zusammengesetzter Reststoffe und damit verbundenen Entsorgungsproblemen.

Nach einem anderen Prinzip arbeitet ein weiterer vorbekannter Rauchartikel. Dabei wird ein cigarettenförmiger Gegenstand mit Filter- und Tabakteil am tabakseitigen Ende in ein elektronisch gesteuertes Abrauchgerät gesteckt. In dem Abrauchgerät erfolgt mit Hilfe von elektrischen Heizelementen eine Erhitzung des tabakhaltigen Teils an mit den Zügen radial aufeinanderfolgenden Stellen. Dieses Prinzip bedingt eine aufwendige Konstruktion des Abrauchgeräts, das mit mehreren Heizelementen und einer komplizierten elektronischen Steuerung ausgerüstet sein muß. Die Handhabung eines derartigen Geräts ist aufgrund der Größe und Gestaltung aufwendig und unterscheidet sich deutlich von der einer herkömmlichen Cigarette.

Es ist Aufgabe der vorliegenden Erfindung, ein System zur Bereitstellung eines inhalierbaren Aerosols zu schaffen, das einen einfachen Grundaufbau hat und insbesondere als Rauchartikel

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dienen kann, der einen ähnlichen Geschmackseindruck wie herkömmliche Cigaretten bietet, bei dessen Gebrauch jedoch zwischen den Zügen kein Nebenstromrauch erzeugt wird.

Diese Aufgabe wird gelöst durch ein System mit den Merkmalen des Anspruchs 1, das eine Inhaliervorrichtung mit den Merkmalen des Anspruchs 33 und eine Substratportion mit den Merkmalen des Anspruchs 35 aufweist und ein Mundstück mit den Merkmalen des Anspruchs 39 aufweisen kann. Vorteilhafte Ausgestaltungen der Erfindung ergeben sich aus den abhängigen Ansprüchen.

Das erfindungsgemäße System zur Bereitstellung eines inhalierbaren Aerosols ist insbesondere als Rauchartikel geeignet, dessen Funktionsweise auf dem Erhitzen eines aerosolbildenden Materials während der Züge beruht. Dabei wird eine vorzugsweise zylindrische Substratportion, die mindestens einen Heizwiderstand aufweist und innerhalb einer Umhüllung das aerosolbildende Material enthält, in einer speziellen, vorzugsweise cigaretten- oder cigarrenförmigen Inhaliervorrichtung abgeraucht. Als Heizwiderstand dient vorzugsweise die Umhüllung der Substratportion, die zu diesem Zweck zumindest abschnittsweise elektrisch leitfähig ist. Die Substratportion wird in der Inhaliervorrichtung während der Züge durch Zuführung elektrischer Energie in die leitfähige Umhüllung erhitzt, so daß sich Aerosol bildet, das durch Ziehen von Luft durch die Lufteintrittsöffnung der Umhüllung über die Aerosolaustrittsöffnung der Umhüllung vom Raucher aufgenommen werden kann. Durch den Gebrauch des Rauchartikels wird die Bildung von Nebenstromrauch in den Zugpausen vermieden.

Das Grundprinzip der Erfindung beruht also auf einer möglichst nahen räumlichen Anordnung von Wärmequelle und Aerosolbildner. Dies wird dadurch erreicht, daß die Substratportion selbst den Heizwiderstand (oder auch mehrere Heizwiderstände) aufweist, der vorzugsweise als leitfähige Umhüllung der Substratportion gestaltet ist und durch Anlegen einer Spannung über die Kontakte in der Inhaliervorrichtung erhitzt wird.

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Gegenüber den oben erwähnten vorbekannten Rauchartikeln besitzt das erfindungsgemäße System den Vorteil, daß trotz einfacher Konstruktion keine Verbrennungsgase inhaliert werden und die nach Gebrauch verbleibenden Reststoffe umweltverträglich entsorgbar gestaltet werden können.

Im folgenden wird die Erfindung anhand von Ausführungsbeispielen näher erläutert. Die Zeichnungen zeigen in

Fig. 1a eine perspektivische Ansicht einer Substratportion gemäß der Erfindung,

Fig. 1b einen Längsschnitt durch die Substratportion gemäß Figur 1a,

Fig. 1c einen Querschnitt durch die Substratportion gemäß Figur 1a,

Fig. 2a einen Längsschnitt durch eine andere Ausführungsform einer Substratportion gemäß der Erfindung, die ein integriertes Mundstück aufweist,

Fig. 2b eine perspektivische Ansicht einer Ausführungsform einer Substratportion, bei der eine Anzahl axial beabstandeter Zonen elektrischer Leitfähigkeit vorgesehen ist,

Fig. 2c eine perspektivische Ansicht einer Ausführungsform einer Substratportion, bei der eine Anzahl in Umfangsrichtung beabstandeter Zonen elektrischer Leitfähigkeit vorgesehen ist,

Fig. 3 einen schematischen Längsschnitt durch eine Inhaliervorrichtung gemäß der Erfindung, in die die Substratportion gemäß Figur 2a eingesetzt ist und die ein sepa-

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rates Gehäuse für Steuerungskomponenten und Stromversorgung aufweist,

Fig. 4a einen schematischen Längsschnitt durch eine andere Ausführungsform einer Inhaliervorrichtung gemäß der Erfindung, die für die Verwendung eines separaten Mundstücks konstruiert ist und die ein separates Gehäuse für Steuerungskomponenten und Stromversorgung aufweist, mit eingesetzter Substratportion und eingesetztem Mundstück,

Fig. 4b eine Veranschaulichung der Benutzung des Systems gemäß Figur 4a durch einen Raucher und

Fig. 5 einen schematischen Längsschnitt durch eine weitere Ausführungsform einer Inhaliervorrichtung gemäß der Erfindung, die für die Verwendung eines separaten Mundstücks konstruiert ist und bei der sich die Stromversorgung im Gehäuse befindet, mit eingesetzter Substratportion und eingesetztem Mundstück.

Eine bevorzugte Ausführungsform einer Substratportion 1 ist in den Figuren 1a bis 1c dargestellt. Die Substratportion 1 besitzt im Ausführungsbeispiel eine zylindrische Form, wie aus den Figuren 1a bis 1c ersichtlich. Sie enthält ein aerosolbildendes Material 2, das mit einer radial (d.h. auf dem Zylindermantel) angeordneten elektrisch leitfähigen Umhüllung 3 umgeben ist.

Das aerosolbildende Material 2 kann z.B. aus geschnittenem Blattabak, geschnittenen Tabakrippen, rekonstituiertem Tabak oder aus einem mit Aromasubstanzen behandelten Trägermaterial bestehen. Der Einsatz von Blatt- und Rippenschnitt kann auch in expandierter Form erfolgen, wie sie z.B. durch Anwendung des in den Patentschriften DE 29 03 300, DE 31 19 330 und DE 34 14 625 beschriebenen Verfahrens erhalten wird. Als Trägermaterialien für Aromastoffe können sowohl organische Materialien wie z.B.

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Papier, als auch anorganische wie z.B. Kieselgel zur Anwendung kommen. Auch beliebige Mischungen der genannten Komponenten sind einsetzbar.

In der bevorzugten Ausführungsform enthält das Material 2 einen Anteil von etwa 3% bis 30% eines flüchtigen Polyols, z.B. Glycerin oder Propylenglykol, um die Aerosolbildung zu verstärken. Eine andere Möglichkeit, die Aerosolbildung zu verstärken, ist der Einsatz der aerosolbildenden Materialien mit einer Feuchte, die deutlich über der Gleichgewichtsfeuchte liegt. So kann z.B. Tabak, dessen Gleichgewichtsfeuchte bei ca. 10% bis 12% liegt, mit einer Feuchte von 20% verwendet werden. In diesem Fall ist durch eine geeignete Verpackung dafür zu sorgen, daß bis zum Gebrauch kein Feuchteverlust auftritt.

Die elektrisch leitfähige Umhüllung 3 kann aus mit leitenden Additiven (wie Metalle oder Graphit/Kohlenstoff) versehenem Papier oder Folientabak oder einer ebenfalls durch Additive leitfähig gemachten Kunststoffolie bestehen. Auch eine mehrlagige Umhüllung ist verwendbar, wobei die innere Lage aus Papier oder Folientabak bestehten kann und die äußere aus einem der genannten, leitfähigen Materialien.

Ebenfalls möglich ist es, die Umhüllung zunächst aus einem nicht leitfähigen Material zu bilden und anschließend vor oder nach dem Umhüllen des aerosolbildenden Materials einen leitfähigen Film aufzubringen, z.B. durch Bedampfen oder Besprühen.

Die Herstellung von Substratportionen 1 kann in einfacher Weise auf einer herkömmlichen Cigarettenstrangmaschine erfolgen: Zunächst wird in einem Formatteil ein Endlosstrang von Tabak oder Ersatzmaterial gebildet; dieser wird mit dem von einer Bobine in Herstellungsrichtung zugeführten, leitfähigen Umhüllungsmaterial umgeben und an einer Naht verleimt. Anschließend erfolgt ein Ablängen in den gewünschten Abmessungen. Eine weitere Möglichkeit der Herstellung ist das Extrudieren eines geeigneten aero-

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solbildenden Materials durch eine Runddüse mit anschließendem Umhüllen und Ablängen des Extrudats.

Vorzugsweise liegt der Durchmesser einer Substratportion 1 im Bereich von 5 mm bis 12 mm und die Länge im Bereich von 10 mm bis 100 mm. Besonders bevorzugt werden Durchmesser von 5 mm bis 10 mm und Längen von 15 mm bis 60 mm.

In einer bevorzugten Ausführungsform ist die Substratportion 1, wie in Figur 2a dargestellt, durch eine gemeinsame Umhüllung 11 mit einem Mundstück 10 verbunden. Die Herstellung eines solchen Verbundes ist dem Fachmann aus der Fertigung von Filtercigaretten vertraut. Die Substratportion 1 kann zusätzlich in Zonen 12 eine im Vergleich zu der übrigen Umhüllung erhöhte elektrische Leitfähigkeit aufweisen, was z.B. durch Umwicklen mit Metallfolie in den Zonen 12 erreicht werden kann, um den elektrischen Kontakt mit den Kontakten in einer Inhaliervorrichtung (siehe unten) zu verbessern.

Während bei der Ausführungsform der Substratportion gemäß Fig. 2a die Substratportion als ein einziger zusammenhängender Heizwiderstand eingerichtet ist, sehen weitere Ausführungsformen der Substratportion eine segmentierte oder abschnittsweise Aufteilung der elektrischen Leitfähigkeit der Umhüllung vor. Dies kann z.B. wie in Figur 2b oder wie in Fig. 2c dargestellt erfolgen.

Die Umhüllung der Substratportion gemäß Figur 2b weist eine Anzahl ringförmiger Zonen 13 mit relativ hoher elektrischer Leitfähigkeit auf, wobei jeweils zwei benachbarte Zonen 13 durch eine isolierende Zone getrennt sind. Jede der Zonen 13 bildet einen separaten Heizwiderstand, der sich in einer auf die Substratportion abgestimmten Inhaliervorrichtung einzeln über entsprechende Kontakte in der Inhaliervorrichtung mit Strom versorgen läßt. Die Lage derartiger Kontakte ist in Fig. 2b durch Pfeile sowie die Polaritäten "+" und "-" gekennzeichnet. Bei einer Varianten dieser Ausführungsform verlaufen die einzelnen

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Zonen 13 nicht über den gesamten Umfang der Substratportion, sondern haben jeweils eine isolierende Unterbrechung. Bei einer anderen Varianten sind die Zonen 13 in einer sich längs der Substratportion erstreckenden Zone elektrisch leitend zusammengelegt, die z.B. entlang der Kontaktstellen "-" (oder der Kontaktstellen "+") gemäß Fig. 2b verläuft, so daß in der Inhaliervorrichtung für diesen Pol in Art einer Masseverbindung nur ein Kontakt vorhanden sein muß.

Bei der in Figur 2c gezeigten Ausführungsform einer Substratportion weist die Umhüllung der Substratportion eine Anzahl in Umfangsrichtung gegeneinander versetzter und gegeneinander isolierter elektrisch leitfähiger Zonen 15 auf. Die als separate Heizwiderstände dienenden Zonen 15 erstrecken sich über die Länge der Substratportion. In einem Endbereich der Substratportion sind sie durch eine ringartige Kontaktzone 14 elektrisch leitend zusammengelegt, wobei der elektrische Widerstand der Kontaktzone 14 vorzugsweise kleiner ist als der einer Zone 15. An diesem Ende ist in einer an die Substratportion angepaßten Inhaliervorrichtung nur ein "-"-Kontakt erforderlich, während am anderen Ende eine Anzahl von Kontakten vorgesehen ist, die in Fig. 2c mit Pfeilen gekennzeichnet und mit "+" bezeichnet sind. Die "+"-Kontakte ermöglichen ein separates Ansteuern der Zonen 15. Um die erforderliche Ausrichtung der Substratportion in der Inhaliervorrichtung in definierter Winkelposition zu gewährleisten, ist im Ausführungsbeispiel eine Positioniereinrichtung in Form einer Kerbe 16 vorgesehen, in die beim Einsetzen der Substratportion in die Inhaliervorrichtung ein entsprechender Führungsvorsprung an der Inhaliervorrichtung eingreift.

Ein Ausführungsbeispiel einer Inhaliervorrichtung (nachfolgend Rauchgerät genannt) wird im folgenden anhand der Figur 3 beschrieben. Dieses Rauchgerät ist zur Benutzung mit einer Substratportion gemäß Fig. 2a eingerichtet.

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Wie Figur 3 zeigt, befinden sich in einem Gehäuse 20 zwei Kontakte (Elektroden) 21 und 22, über die der Kontakt zur leitfähigen Umhüllung einer von dem Rauchgerät aufgenommenen Substratportion hergestellt wird. Der Hohlraum im Innern des Gehäuses 20 und die Kontakte 21 und 22 bilden dabei eine Aufnahmeeinrichtung zum Halten der Substratportion. Durch eine Öffnung 24 kann Luft durch die Substratportion gezogen werden. Über eine elektrische Verbindung 25 ist der Kontakt 21 direkt mit einer in einem separaten Gehäuse angeordneten Versorgungseinheit 30 verbunden. Die Verbindung zum Kontakt 22 verläuft über einen Schalter 23, mit dem der Stromkreis geschlossen werden kann. Die Versorgungseinheit 30 enthält eine Batterie oder einen Akkumulator 31 sowie optional eine Steuerung 32. Im Falle eines Akkumulators kann dieser über Steckkontakte 33 aufgeladen werden.

Der Gebrauch des Rauchgerätes geht wie folgt vor sich: Das Rauchgerät ist mit der Versorgungseinheit 30 über ein Kabel (Verbindung 25) verbunden (siehe auch Figur 4b). Die mit dem Mundstück 10 versehene Substratportion 1 wird in eine konisch ausgestaltete Öffnung an einer der Stirnseiten des Gehäuses 20 geschoben, bis sie einen Anschlag bei dem Kontakt 21 erreicht, siehe Figur 3. Das Rauchgerät wird nun zum Mund geführt und der Schalter 23 betätigt. Durch Schließen des Stromkreises wird die Substratportion durch den über die Kontakte 21 und 22 durch die als Heizwiderstand wirkende Umhüllung fließenden Strom erhitzt, und das entstehende Aerosol kann durch das Mundstück 10 entnommen werden. Das Abschalten geschieht durch Loslassen des Schalters 23 oder durch die Steuerung 32. Auf diese Weise können mehrere Züge entnommen werden. Nach Gebrauch wird die Substratportion 1 mit dem Mundstück 10 aus dem Rauchgerät entnommen und entsorgt. Von Zeit zu Zeit ist ein Batteriewechsel oder Aufladen des Akkumulators 31 in der Versorgungseinheit 30 notwendig.

Figur 4a zeigt eine andere Ausführungsform des Systems, die sich von der vorhergehenden dadurch unterscheidet, daß Mundstück 10' und Substratportion 1' nicht miteinander verbunden sind. Das

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Mundstück 10′ wird in einen Sockel 42 eingesteckt, der nach Einlegen der Substratprotion 1′ in ein Rauchgerät, das ein Gehäuse 40 aufweist, mit dem Gehäuse 40 verschraubt wird. Der Sockel 42 dient gleichzeitig als Kontakt. Funktion und Gebrauch dieses Rauchgeräts und der übrigen Komponenten des Systems entsprechen ansonsten dem vorherigen Ausführungsbeispiel. In Figur 4a sind der zweite Kontakt mit 41, der Schalter mit 43, die Öffnung für die Luftzuführung mit 44, das Verbindungskabel mit 45, die Versorgungseinheit mit 30′, die Batterie oder der Akkumulator mit 31′, die Steuerung mit 32′ und die Steckkontakte mit 33′ bezeichnet.

Der Gebrauch des Rauchartikels ist in Figur 4b dargestellt. Das Rauchgerät mit Mundstück und Substratportion kann wie eine herkömmliche Cigarette gehandhabt werden; die Versorgungseinheit wird bevorzugt in einer Brusttasche, Gürtelhalterung o.ä. getragen. Beide Teile sind durch ein hochflexibles Kabel (Verbindungskabel 45) ausreichender Länge miteinander verbunden.

Eine einteilige Ausführungsform des Rauchgeräts mit cigarrenähnlicher Form ist in Figur 5 dargestellt. Ein Gehäuse 50 besitzt am vorderen Ende eine abschraubbare Kappe 53, durch die ein Wechsel einer Batterie bzw. eines Akkumulators 51 möglich ist. Ein schwenkbare Klappe 52, die auch in aufgeschwenktem Zustand eingezeichnet ist, dient zum Einlegen einer Substratportion 1". Beim Öffnen der Klappe 52 wird über ein nicht dargestelltes Gestänge gleichzeitig ein Aufnahmeteil 55 gegen die Kraft einer Schraubenfeder 56 nach hinten bewegt, um das Einlegen der Substratportion 1" zu erleichtern. Die bei geschlossener Klappe 52 wirkende Kraft der Schraubenfeder 56 bewirkt eine Fixierung der Substratportion 1" zwischen einem Kontakt 57 und dem Aufnahmeteil 55, das gleichtzeitig als Gegenkontakt dient. Durch Schließen eines Schalters 60 fließt zwischen den Kontakten 55, 57 Strom über die leitfähige Umhüllung der Substratportion 1", so daß diese erwärmt wird. Das Rauchaerosol kann durch Ziehen an einem in das Aufnahmeteil 55 eingesteckten Mundstück 10" ent-

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nommen werden, das als separate Komponente gestaltet ist und in diesem Ausführungsbeispiel nicht fest mit der Substratportion 1" verbunden ist. Dabei strömt Luft durch einen Kanal 54 nach und tritt an der vorderen Stirnseite der Substratportion 1" in die Substratportion 1" ein.

In einem Rauchgerät, das für die Benutzung einer Substratportion gemäß Fig. 2b oder gemäß Fig. 2c eingerichtet ist, befinden sich Kontakte, die paarweise einer als Heizwiderstand dienenden Zone 13 bzw. 15 zugeordnet sind. Wenn, wie oben beschrieben, ein gemeinsamer Pol elektrisch leitend zusammengelegt ist, braucht dafür nur ein Kontakt vorhanden zu sein. Durch sequentielle Stromversorgung jeweils einer Zone 13 bzw. 15 kann jeweils ein neuer Teil der Substratportion erhitzt werden, wodurch eine gleichmäßigere Aerosolausbeute über die Züge erreicht wird. Dies ergibt ein weitgehend konstantes Geschmacksangebot pro Zug. Die Steuerung kann beispielsweise über einen Zugdetektor erfolgen, der auf die Druckänderung beim Ansagen von Luft durch den Benutzer reagiert und über eine Schalteinrichtung die Stromversorgung einer der Zonen 13 bzw. 15 bewirkt. Beim nächsten Zug spricht die Schalteinrichtung wieder an, aber eine elektronische Schaltung sorgt dafür, daß der Heizstrom über die zugeordneten Kontakte diesmal an eine andere, noch nicht benutzte Zone 13 bzw. 15 gelegt wird, usw.

Für die Konstruktion des Mundstückes 10, 10' oder 10" sind grundsätzlich alle dem Fachmann aus der Cigarettenindustrie bekannten Prinzipien anwendbar. Im einfachsten Fall besteht das Mundstück aus einer hohlen Papier- oder Kartonrolle. Bevorzugt wird jedoch die Ausführung als Filtermundstück. In diesem Fall ist ein Filtermaterial wie Celluloseacetat, Polypropylen oder Papier mit einer ein- oder mehrlagigen Umhüllung versehen. Auch eine den bekannten Mehrfachfiltern entsprechende Konstruktion kann verwendet werden, bei der in axialer Richtung mehrere Segmente mit unterschiedlichen Eigenschaften hintereinander angeordnet und durch eine äußere Umhüllung verbunden sind. In diesem

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Fall können ein oder mehrere Segmente mit axialen Bohrungen versehen sein. Bei allen genannten Konstruktionen besteht weiterhin die Möglichkeit des Einsatzes einer zonenperforierten Umhüllung oder einer nachträglichen Perforation der Umhüllung z.B. mit Hilfe eines Laserstrahls. Hierdurch kann bei den Zügen der Rauch durch Hinzuströmen von Außenluft verdünnt werden.

Weitere Varianten des Systems bzw. seiner Komponenten ergeben sich unmittelbar aus den Ansprüchen.

Im folgenden ist ein weiteres Beispiel für eine Substratportion mit Mundstück und seine Benutzung in dem System angegeben.

Beispiel

Eine American-Blend-Tabakmischung mit einem Gehalt von

30% Burley-Tabak
40% expandiertem Virginia-Tabak
20% nicht expandiertem Virginia-Tabak und
10% Orient-Tabak

wurde konditioniert und mit 12 Gew.-% eines wäßrigen Casings mit einem Glyceringehalt von 80 Gew.-% besprüht. Anschließend wurde der Tabak mit 0,8 mm Schnittbreite geschnitten und auf eine Feuchte von 12% abgetrocknet. 180 kg dieses Schnittabaks wurden mit 20 kg expandiertem Rippenschnitt vermischt.

Aus dieser Mischung wurde auf einer Cigarettenstrangmaschine ein Endlosstrang mit einem Durchmesser von 6 mm und einer Stopfdichte von 200 mg/ml hergestellt. Als Umhüllungsmaterial kam ein durch Graphitzusatz leitfähig gemachtes, luftundurchlässiges Papier zum Einsatz. Der Endlosstrang wurde in Einzelportionen von 40 mm Länge geschnitten, und diese wurden in bekannter Weise durch ein Mundstückbelagpapier mit einem Acetatfilterstöpsel verbunden.

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Die so erhaltene Substratportion wurde in einem Rauchgerät nach Figur 3 abgeraucht, ohne daß sichtbare Mengen Nebenstromrauch entstanden. Der Geschmack wurde von Probanden als gleichmäßig und dem herkömmlicher Cigaretten gleichwertig beurteilt.

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Patentansprüche

1. System zur Bereitstellung eines inhalierbaren Aerosols, mit
- einer Substratportion (1; 1'; 1"), die mindestens einen Heizwiderstand (3; 13; 15) aufweist und innerhalb einer Umhüllung (3) aerosolbildendes Material (2) enthält, wobei die Umhüllung (3) eine Lufteintrittsöffnung und eine Aerosolaustrittsöffnung aufweist, und
- einer Inhaliervorrichtung, die ein Gehäuse (20; 40; 50), eine Aufnahmeeinrichtung zum Halten der Substratportion (1; 1'; 1") und mit einer Spannungsquelle (31; 31'; 51) in Verbindung stehende oder in Verbindung bringbare Kontakte (21, 22; 41, 42; 55, 57) zum Zuführen von elektrischer Leistung zu dem mindestens einen Heizwiderstand (3; 13; 15) der Substratportion (1; 1'; 1") aufweist.

2. System nach Anspruch 1, gekennzeichnet durch ein Mundstück (10; 10'; 10"), das separat (10'; 10") mit der Inhaliervorrichtung verbindbar ist oder mit der Substratportion (1) verbunden ist und im Betriebszustand mit der Aerosolaustrittsöffnung der Substratportion (1; 1'; 1") in Verbindung steht.

3. System nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß die Umhüllung (3) der Substratportion (1; 1'; 1") zumindest abschnittsweise elektrisch leitfähig ist und als mindestens ein Heizwiderstand (3; 13; 15) eingerichtet ist.

4. System nach Anspruch 3, dadurch gekennzeichnet, daß die Umhüllung (3) der Substratportion als ein einziger zusammenhängender Heizwiderstand eingerichtet ist.

5. System nach Anspruch 3, dadurch gekennzeichnet, daß die Substratportion eine Längsachse hat und die Umhüllung der Substratportion eine Anzahl axial gegeneinander versetzter und gegeneinander isolierter Heizwiderstände (13) aufweist,

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die vorzugsweise in einer sich längs der Substratportion erstreckenden Zone elektrisch leitend zusammengelegt sind.

6. System nach Anspruch 3, dadurch gekennzeichnet, daß die Substratportion eine Längsachse hat und die Umhüllung der Substratportion eine Anzahl in Umfangsrichtung gegeneinander versetzter und gegeneinander isolierter Heizwiderstände (15) aufweist, die sich vorzugsweise über die Länge der Substratportion erstrecken und die vorzugsweise in einem Endbereich (14) der Substratportion elektrisch leitend zusammengelegt sind, wobei die Substratportion vorzugsweise eine an die Inhaliervorrichtung angepaßte Positioniereinrichtung (16) zum Einsetzen in die Inhaliervorrichtung in definierter Winkelposition aufweist.

7. System nach einem der Ansprüche 3 bis 6, dadurch gekennzeichnet, daß die Umhüllung (3) der Substratportion (1; 1'; 1") Metallfolie, metallbeschichtetes oder metallhaltiges Papier, kohlehaltiges Papier, graphithaltiges Papier, einen elektrisch leitfähigen Film, mit leitfähigen Additiven versehene Kunststoffolie und/oder mit leitfähigen Additiven versehenen Folientabak aufweist.

8. System nach einem der Ansprüche 3 bis 7, dadurch gekennzeichnet, daß die Umhüllung (3) der Substratportion (1; 1'; 1") mehrere Lagen von Umhüllungsmaterialien aufweist, wobei die äußere Lage elektrisch leitendes Material aufweist und die innere Lage vorzugsweise aus Papier oder Folientabak besteht.

9. System nach einem der Ansprüche 3 bis 8, dadurch gekennzeichnet, daß die Umhüllung (3) der Substratportion (1; 1'; 1") in dem Bereich zwischen den Kontaktstellen zu den beiden einem Heizwiderstand (3; 13; 15) zugeordneten Kontakten (21, 22; 41, 42; 55, 57) der Inhaliervorrichtung einen elektrischen Widerstand von 0,1 Ohm bis 1000 Ohm aufweist.

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10. System nach einem der Ansprüche 3 bis 9, dadurch gekennzeichnet, daß die mit den Kontakten (21, 22; 41, 42; 55, 57) der Inhaliervorrichtung in Kontakt bringbaren Zonen (12) der Umhüllung (3) der Substratportion (1) eine gegenüber dem übrigen Material der Umhüllung (3) erhöhte elektrische Leitfähigkeit aufweisen, vorzugsweise durch Metallbeschichtung.

11. System nach einem der Ansprüche 1 bis 10, dadurch gekennzeichnet, daß die Substratportion (1; 1'; 1") eine zylindrische Form mit einer Länge von 10 mm bis 100 mm, vorzugsweise von 15 mm bis 60 mm, und einem Durchmesser von 4 mm bis 12 mm, vorzugsweise von 5 mm bis 10 mm, aufweist.

12. System nach einem der Ansprüche 3 bis 10 und nach Anspruch 11, dadurch gekennzeichnet, daß die zumindest abschnittsweise elektrisch leitfähige Umhüllung (3) der Substratportion (1; 1'; 1") als Zylindermantel angeordnet ist und die Stirnseiten des Zylinders als Lufteintrittsöffnung und als Aerosolaustrittsöffnung eingerichtet sind.

13. System nach einem der Ansprüche 1 bis 12, dadurch gekennzeichnet, daß das aerosolbildende Material (2) der Substratportion (1; 1'; 1") Schnittabak, geschnittene Tabakrippen, Folientabakschnitt und/oder ein extrudiertes Tabakmaterial aufweist.

14. System nach einem der Ansprüche 1 bis 13, dadurch gekennzeichnet, daß das aerosolbildende Material (2) der Substratportion (1; 1'; 1") ein mit Aromasubstanzen beaufschlagtes Trägermaterial aufweist.

15. System nach einem der Ansprüche 1 bis 14, dadurch gekennzeichnet, daß das aerosolbildende Material (2) der Substratportion (1; 1'; 1") ein verdampfbares Polyol, vorzugsweise Glycerin oder Propylenglykol, zu einem Anteil von 5 Gew.-%

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bis 50 Gew.-%, vorzugsweise von 10 Gew.-% bis 30 Gew.-% enthält.

16. System nach einem der Ansprüche 1 bis 15, dadurch gekennzeichnet, daß die Inhaliervorrichtung mindestens einen Schalter (23; 43; 60) für den mindestens einen Heizwiderstand (3; 13; 15) aufweist.

17. System nach einem der Ansprüche 1 bis 16, dadurch gekennzeichnet, daß die Inhaliervorrichtung einen Zugdetektor aufweist, der zusammen mit einer Schalteinrichtung dazu eingerichtet ist, den durch einen Heizwiderstand (3; 13; 15) der Substratportion (1; 1'; 1") führenden Stromkreis in Abhängigkeit von der auf die Lufteintrittsöffnung der Substratportion (1; 1'; 1") gerichteten Strömungsgeschwindigkeit zu schalten.

18. System nach einem der Ansprüche 1 bis 17, dadurch gekennzeichnet, daß die Inhaliervorrichtung eine Schaltung, vorzugsweise eine elektronische Schaltung (32; 32'), zum Steuern der von dem mindestens einen Heizwiderstand (3; 13; 15) der Substratportion (1; 1'; 1") abgegebenen Leistung aufweist.

19. System nach Anspruch 18 in Verbindung mit Anspruch 4, dadurch gekennzeichnet, daß die Schaltung (32; 32') der Inhaliervorrichtung dazu eingerichtet ist, die Spannung oder den Strom für den Heizwiderstand (3) der Substratportion (1; 1'; 1") dergestalt zu steuern, daß die Heizleistung beim ersten Zug auf einen höheren Wert als bei den Folgezügen eingestellt wird, sowie nach einer definierten Zugzeit die Leistungszufuhr zu unterbrechen, um eine Überhitzung zu vermeiden.

20. System nach Anspruch 18 in Verbindung mit Anspruch 5 oder 6, dadurch gekennzeichnet, daß die Schaltung (32; 32') der

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Inhaliervorrichtung dazu eingerichtet ist, zum sequentiellen Einschalten der einzelnen Heizwiderstände (13; 15) den einzelnen Heizwiderständen (13; 15) zugeordnete Kontakte sequentiell anzusteuern.

21. System nach einem der Ansprüche 18 bis 20, dadurch gekennzeichnet, daß die Schaltung im Innern des Gehäuses der Inhaliervorrichtung untergebracht ist.

22. System nach einem der Ansprüche 18 bis 20, dadurch gekennzeichnet, daß die Schaltung (32; 32') in einem separaten Gehäuse (30; 30') untergebracht ist, das mit dem Gehäuse (20; 40) der Inhaliervorrichtung über ein Kabel (25; 45) verbunden oder verbindbar ist.

23. System nach einem der Ansprüche 1 bis 22, dadurch gekennzeichnet, daß für die Leistungszufuhr an die Kontakte (21, 22; 41, 42; 55, 57) der Inhaliervorrichtung eine Batterie oder ein Akkumulator (31; 31'; 51) vorgesehen ist, die bzw. der in dem Gehäuse (50) der Inhaliervorrichtung oder in einem separaten Gehäuse (30; 30') untergebracht oder unterbringbar ist.

24. System nach einem der Ansprüche 1 bis 23, dadurch gekennzeichnet, daß das Gehäuse (50) der Inhaliervorrichtung eine cigarrenähnliche Form aufweist.

25. System nach einem der Ansprüche 1 bis 23, dadurch gekennzeichnet, daß das Gehäuse (20; 40) der Inhaliervorrichtung eine cigarettenenähnliche Form aufweist.

26. System nach einem der Ansprüche 2 bis 25 in Verbindung mit Anspruch 2, dadurch gekennzeichnet, daß das Mundstück (10; 10'; 10") eine Länge von 10 mm bis 50 mm und einen Durchmesser von 4 mm bis 12 mm aufweist.

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27. System nach einem der Ansprüche 2 bis 26 in Verbindung mit Anspruch 2, dadurch gekennzeichnet, daß das Mundstück (10; 10'; 10") eine hohle Papier- oder Kartonhülse aufweist.

28. System nach einem der Ansprüche 2 bis 26 in Verbindung mit Anspruch 2, dadurch gekennzeichnet, daß das Mundstück (10; 10'; 10") als Filtermundstück ausgebildet ist, wobei das Filtermaterial vorzugsweise Celluloseacetat, Papier, Myria und/oder Polypropylen mit einer ein- oder mehrlagigen Papierumhüllung aufweist.

29. System nach Anspruch 28, dadurch gekennzeichnet, daß das Mundstück (10; 10'; 10") einen Filterstöpsel aus mehreren in axialer Richtung hintereinander angeordneten Teilelementen aufweist, von denen vorzugsweise eines oder mehrere axiale Bohrungen aufweisen.

30. System nach einem der Ansprüche 2 bis 29 in Verbindung mit Anspruch 2, dadurch gekennzeichnet, daß das Mundstück (10; 10'; 10") eine oder mehrere Perforationszonen aufweist.

31. System nach einem der Ansprüche 2 bis 30 in Verbindung mit Anspruch 2, dadurch gekennzeichnet, daß die Substratportion (1) und das Mundstück (10) einen ähnlichen Durchmesser aufweisen und miteinander verbunden sind.

32. System nach Anspruch 31, dadurch gekennzeichnet, daß die Substratportion (1) und das Mundstück (10) durch eine gemeinsame Umwicklung (11) mit einem Mundstückbelagpapier verbunden sind.

33. Inhaliervorrichtung, mit einem Gehäuse (20; 40; 50), mit einer Aufnahmeeinrichtung zum Halten einer ein aerosolbildendes Material aufweisenden Substratportion (1; 1'; 1") und mit mit einer Spannungsquelle (31; 31'; 51) in Verbindung stehenden oder in Verbindung bringbaren Kontakten (21, 22;

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41, 42; 55, 57) zum Zuführen von elektrischer Leistung zu mindestens einem Heizwiderstand der Substratportion (1; 1'; 1").

34. Inhaliervorrichtung nach Anspruch 33, gekennzeichnet durch Merkmale der Inhaliervorrichtung aus einem der Ansprüche 16 bis 25.

35. Substratportion, die zur Verwendung mit einer Inhaliervorrichtung nach Anspruch 33 oder 34 eingerichtet ist und die mindestens einen Heizwiderstand (3; 13; 15) aufweist und innerhalb einer Umhüllung (3) aerosolbildendes Material (2) enthält, wobei die Umhüllung (3) eine Lufteintrittsöffnung und eine Aerosolaustrittsöffnung aufweist.

36. Substratportion nach Anspruch 35, gekennzeichnet durch Merkmale der Substratportion (1; 1'; 1") aus einem der Ansprüche 3 bis 15.

37. Substratportion nach Anspruch 35 oder 36, gekennzeichnet durch ein Mundstück (10), das mit der Substratportion (1) verbunden ist und mit der Aerosolaustrittsöffnung der Substratportion (1) in Verbindung steht.

38. Substratportion nach Anspruch 37, dadurch gekennzeichnet, daß das Mundstück (10; 10'; 10") Merkmale aus einem der Ansprüche 26 bis 32 aufweist.

39. Mundstück, das zur Verwendung mit einer Inhaliervorrichtung nach Anspruch 33 oder 34 eingerichtet ist, separat (10'; 10") mit der Inhaliervorrichtung verbindbar ist und im Betriebszustand mit der Aerosolaustrittsöffnung der Substratportion (1'; 1") in Verbindung steht.

40. Mundstück nach Anspruch 39, gekennzeichnet durch Merkmale des Mundstücks (10'; 10") aus einem der Ansprüche 26 bis 30.

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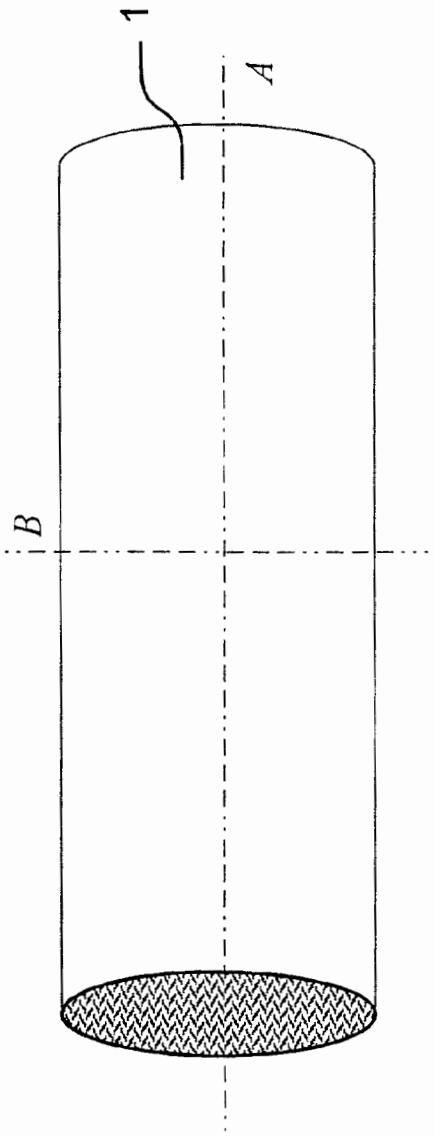


Fig. 1a

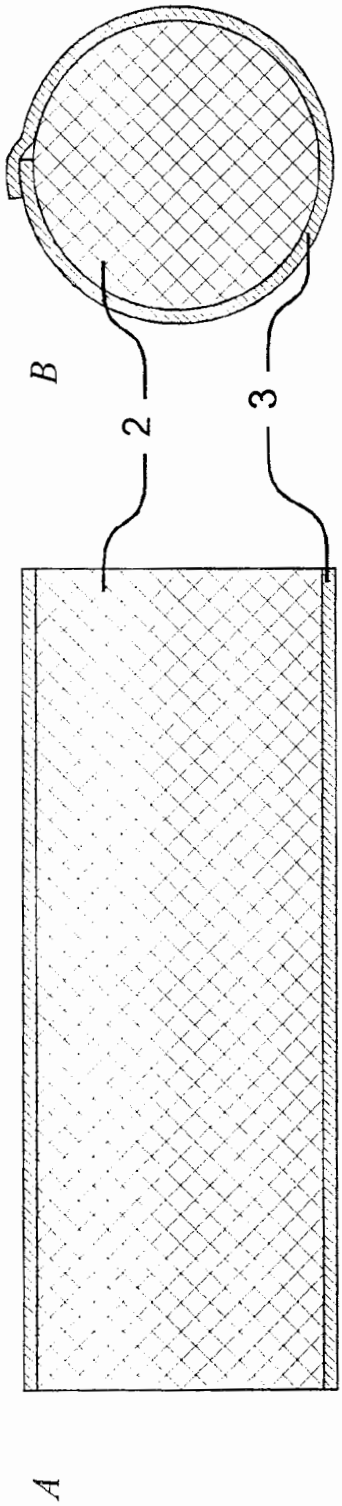


Fig. 1b

Fig. 1c

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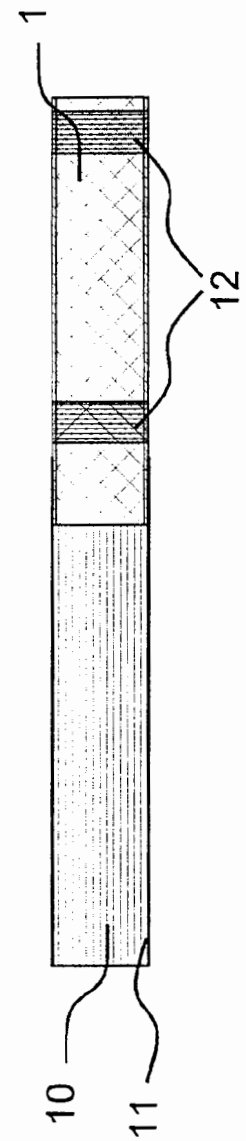


Fig. 2a

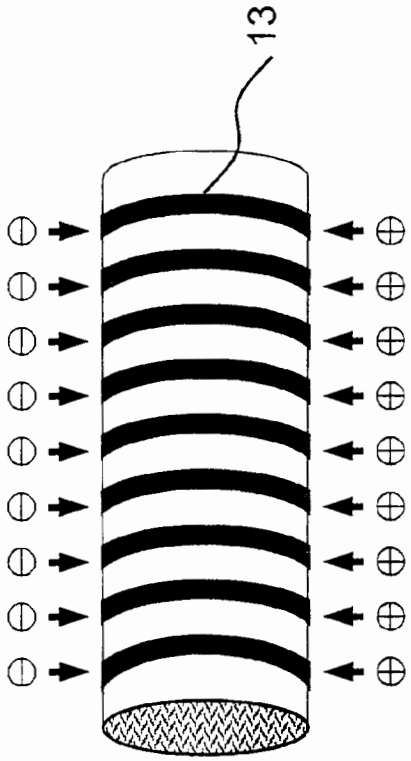


Fig. 2b

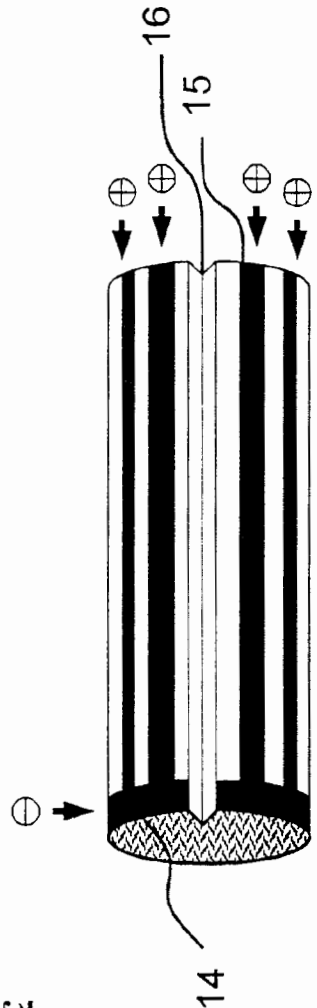


Fig. 2c

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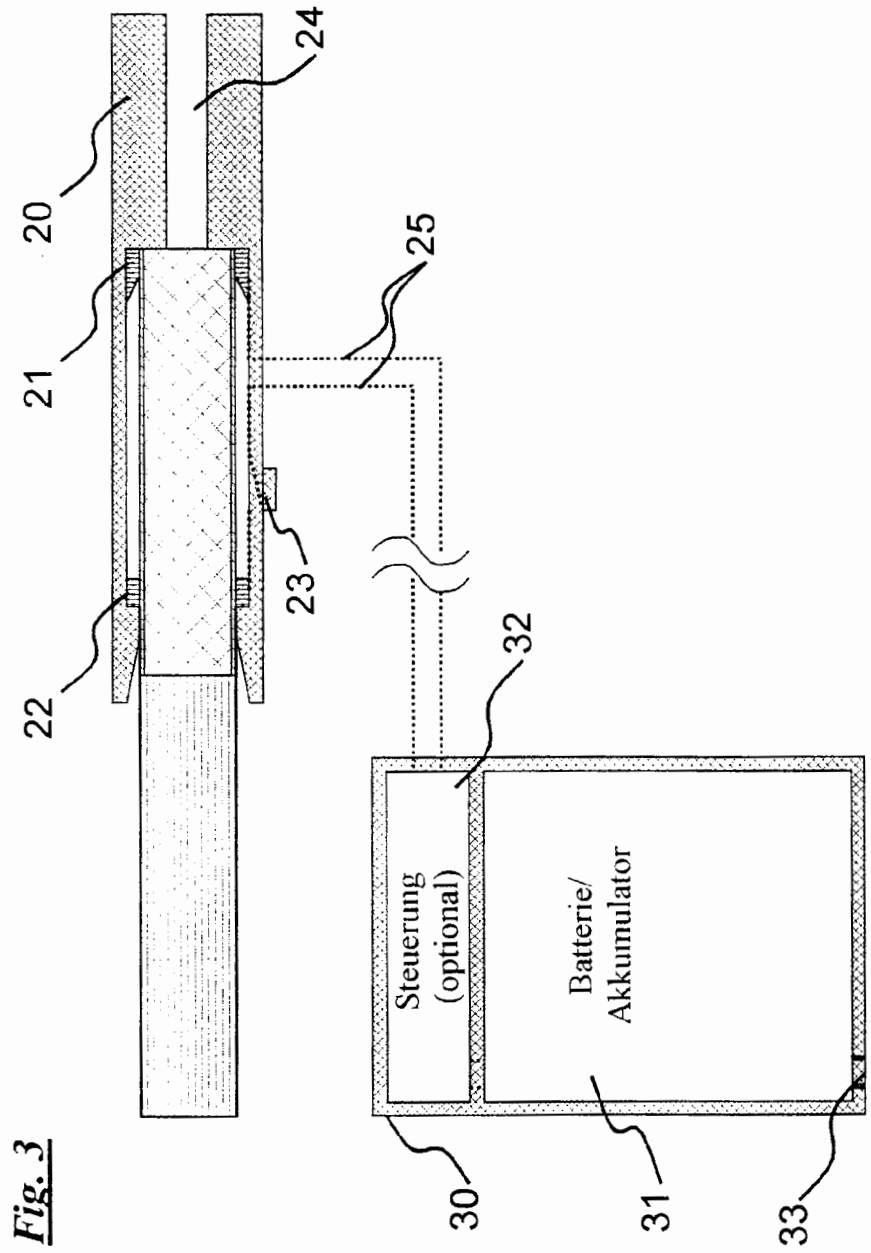


Fig. 3

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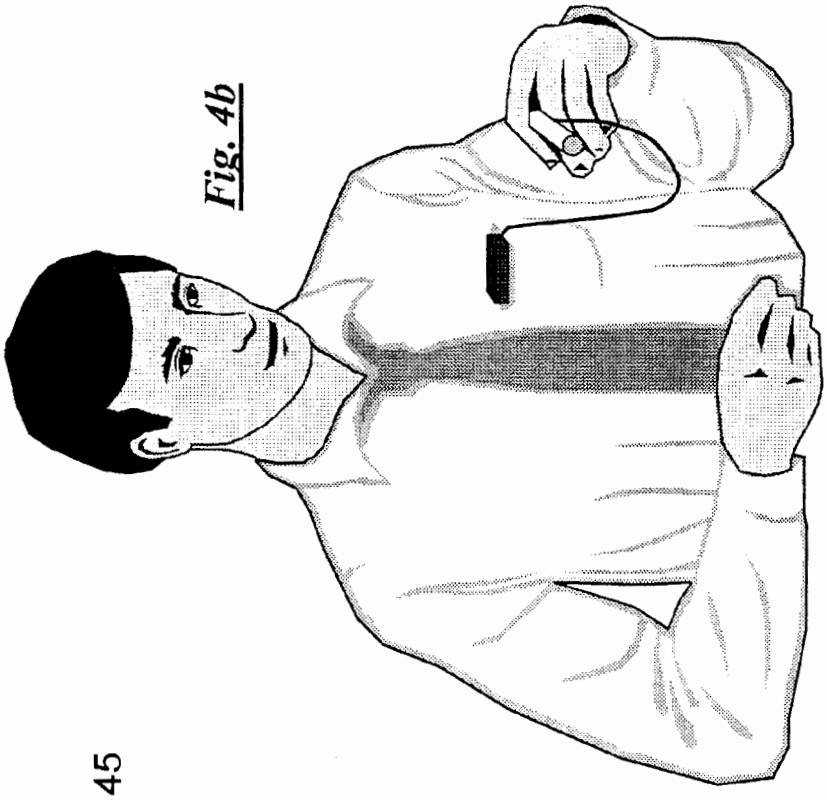


Fig. 4b

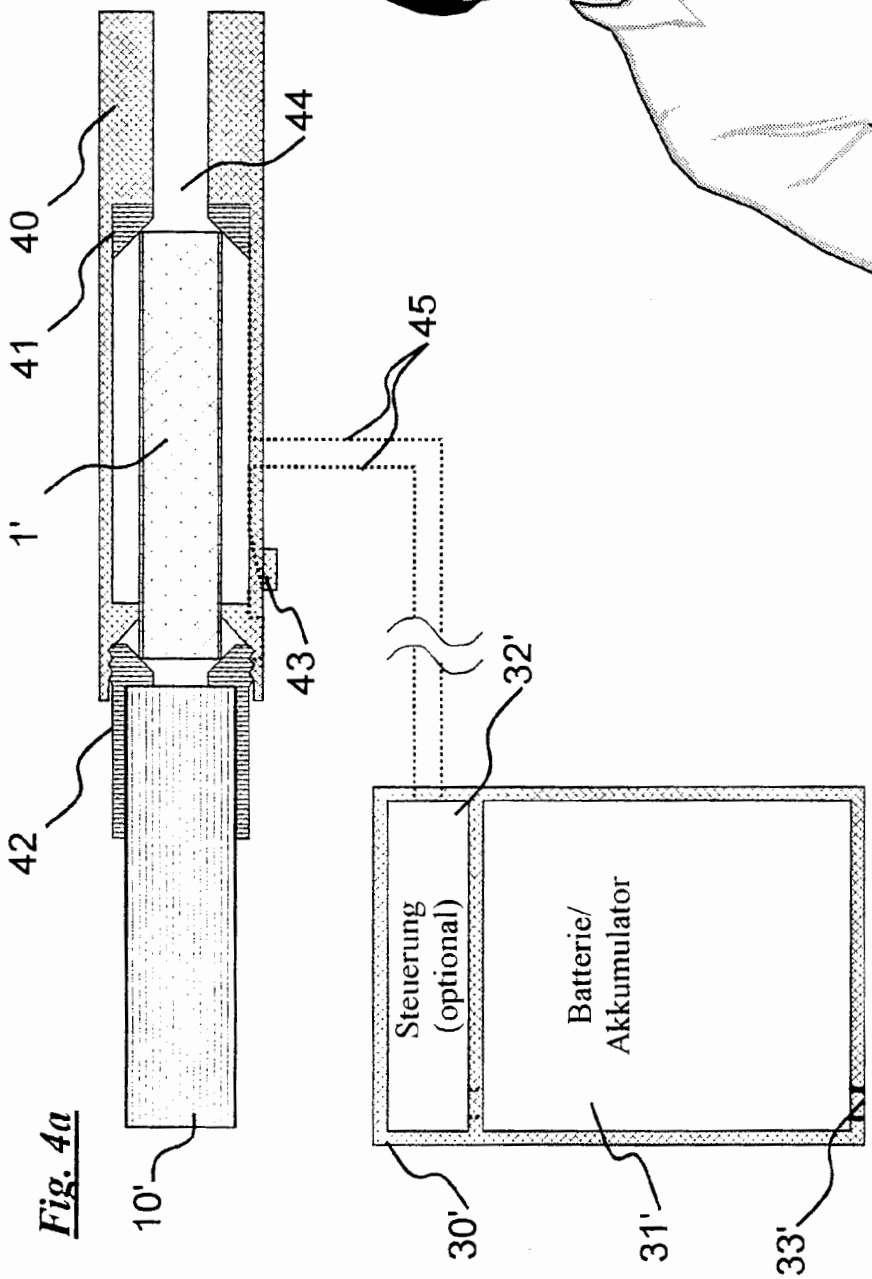


Fig. 4a

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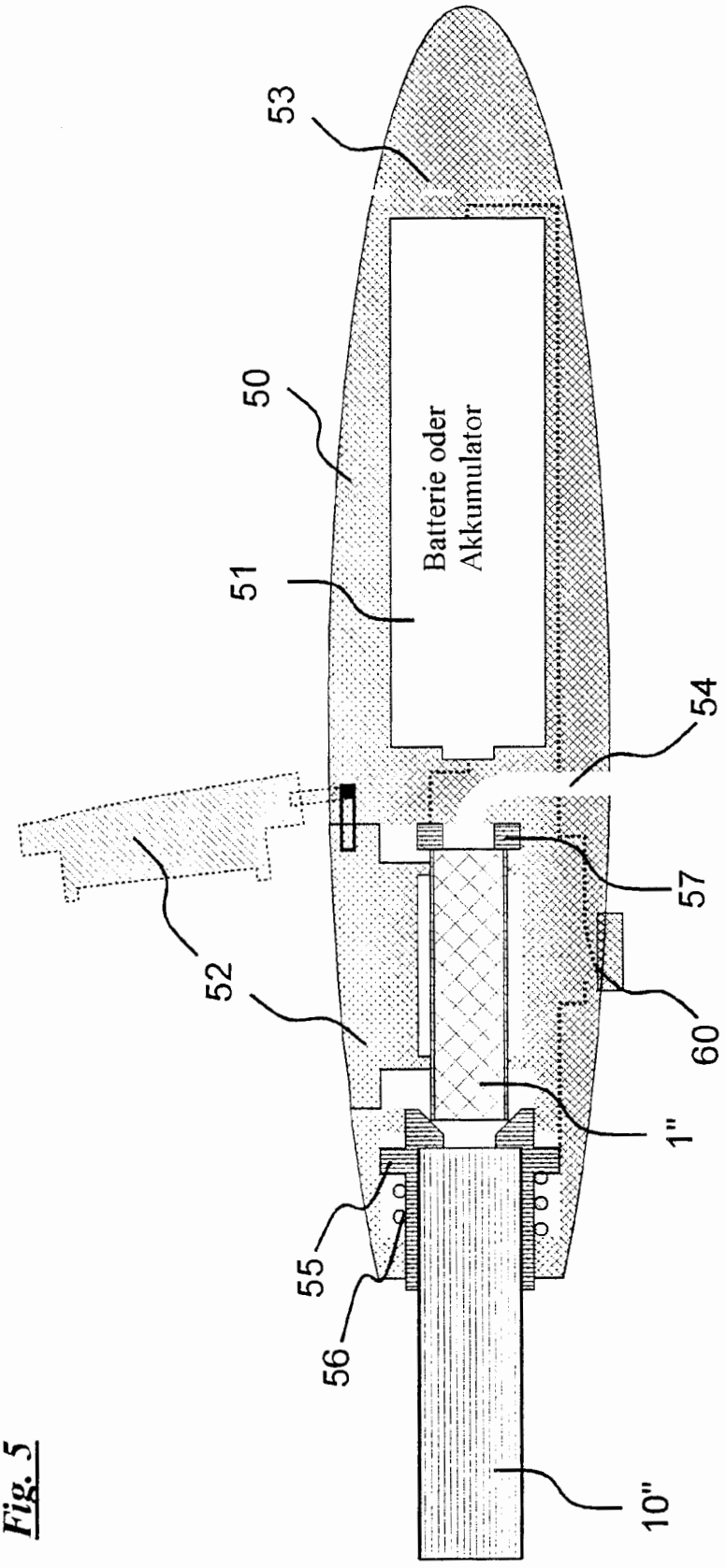


Fig. 5

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INTERNATIONAL SEARCH REPORT

Int ional Application No
PCT/EP 99/08428

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A24F47/00

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 7 A24F

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 practical, 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	EP 0 503 767 A (PHILIP MORRIS PRODUCTS INC.) 16 September 1992 (1992-09-16) the whole document ---	1,2, 13-16, 23,25, 28,31,33
A	EP 0 488 488 A (PHILIP MORRIS PRODUCTS INC.) 3 June 1992 (1992-06-03) the whole document -----	1,2, 13-16, 23,25, 28,31,33

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

☒ Patent family members are listed in annex.

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
1 February 2000	09/02/2000

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Riegel, R

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INTERNATIONAL SEARCH REPORT

Information on patent family members

Int tional Application No
PCT/EP 99/08428

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INTERNATIONALER RECHERCHENBERICHT

Inte ionales Aktenzeichen
PCT/EP 99/08428

A. KLASSIFIZIERUNG DES ANMELDUNGSGEGENSTANDES
IPK 7 A24F47/00

Nach der Internationalen Patentklassifikation (IPK) oder nach der nationalen Klassifikation und der IPK

B. RECHERCHIERTE GEBIETE

Recherchierter Mindestprüfstoff (Klassifikationssystem und Klassifikationssymbole)
IPK 7 A24F

Recherchierte aber nicht zum Mindestprüfstoff gehörende Veröffentlichungen, soweit diese unter die recherchierten Gebiete fallen

Während der internationalen Recherche konsultierte elektronische Datenbank (Name der Datenbank und evtl. verwendete Suchbegriffe)

C. ALS WESENTLICH ANGESEHENE UNTERLAGEN

Kategorie°	Bezeichnung der Veröffentlichung, soweit erforderlich unter Angabe der in Betracht kommenden Teile	Betr. Anspruch Nr.
A	EP 0 503 767 A (PHILIP MORRIS PRODUCTS INC.) 16. September 1992 (1992-09-16) das ganze Dokument	1,2, 13-16, 23,25, 28,31,33
A	EP 0 488 488 A (PHILIP MORRIS PRODUCTS INC.) 3. Juni 1992 (1992-06-03) das ganze Dokument	1,2, 13-16, 23,25, 28,31,33

☐ Weitere Veröffentlichungen sind der Fortsetzung von Feld C zu entnehmen

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Datum des Abschlusses der internationalen Recherche	Absendedatum des internationalen Recherchenberichts
1. Februar 2000	09/02/2000

Name und Postanschrift der Internationalen Recherchenbehörde	Bevollmächtigter Bediensteter
Europäisches Patentamt, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Riegel, R

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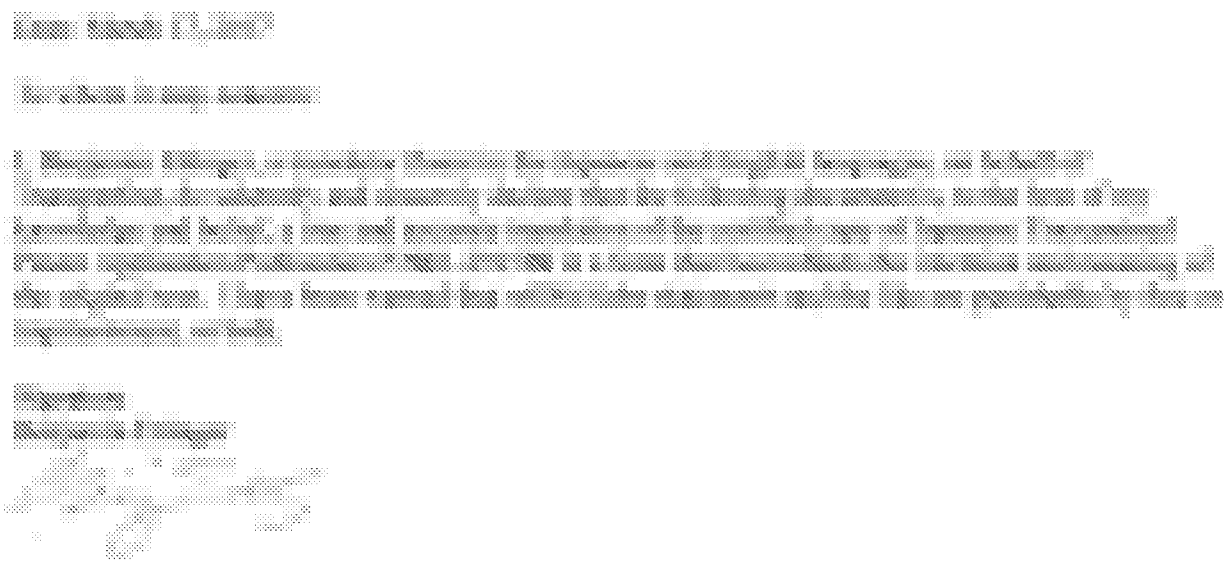
INTERNATIONALER RECHERCHENBERICHT

Angaben zu Veröffentlichungen, die zur selben Patentfamilie gehören

Internationales Aktenzeichen
PCT/EP 99/08428

Im Recherchenbericht angeführtes Patentdokument	Datum der Veröffentlichung	Mitglied(er) der Patentfamilie	Datum der Veröffentlichung
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		US 5179966 A	19-01-1993

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Request for Certificate

January 30, 2017

To: Commissioner of the Patent Office

1. Indication of the case
Japanese Patent Application 2000-108268

2. Demandant

Postal code	105-0001
Address or domicile	1307 BUREX Toranomon 7-5 Toranomon 2-chome, Minato-ku, Tokyo-to
Name or title	Shigeru Ito

3. Document to be certified

Japanese Unexamined Patent Application Publication
(Japanese Unexamined Patent Application Publication 2001-291598)

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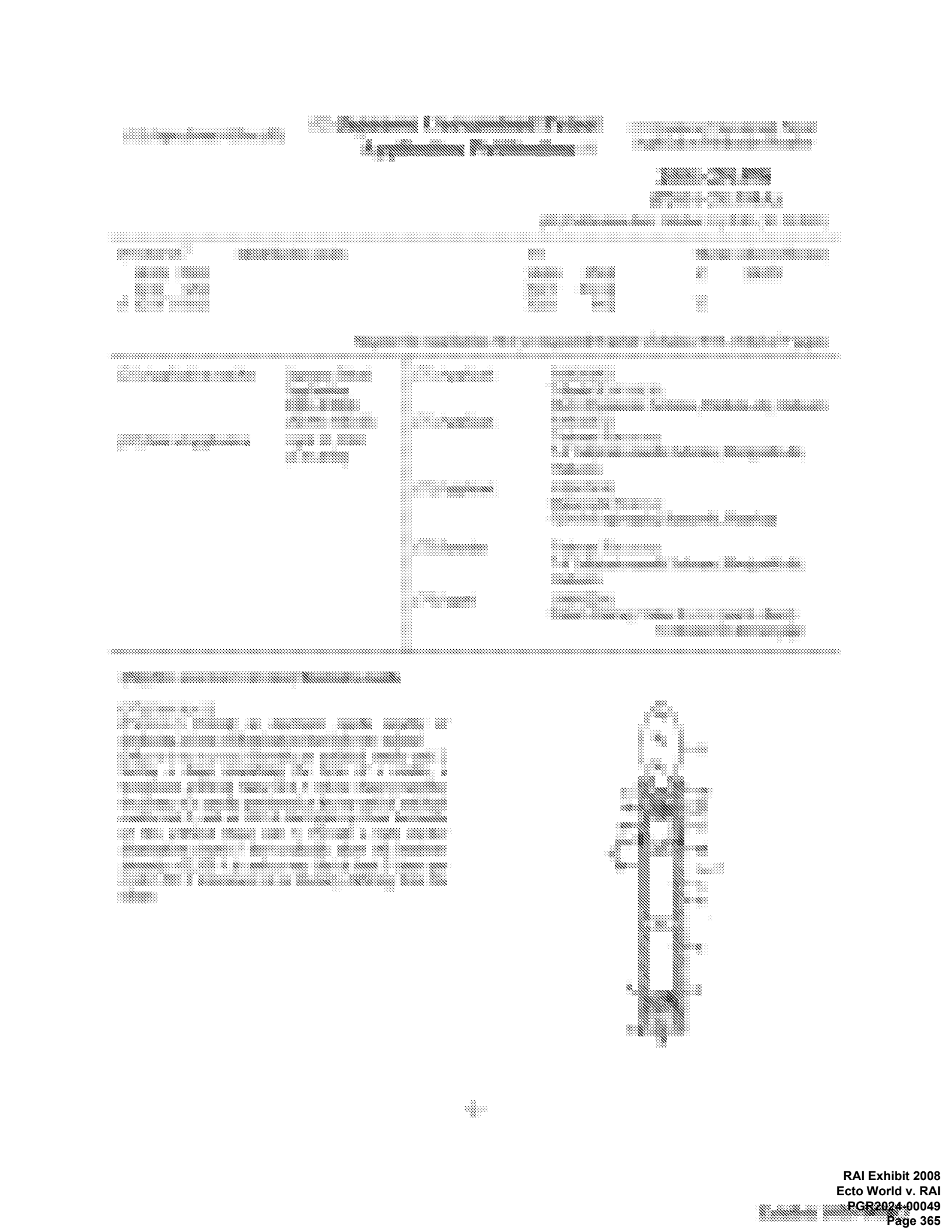
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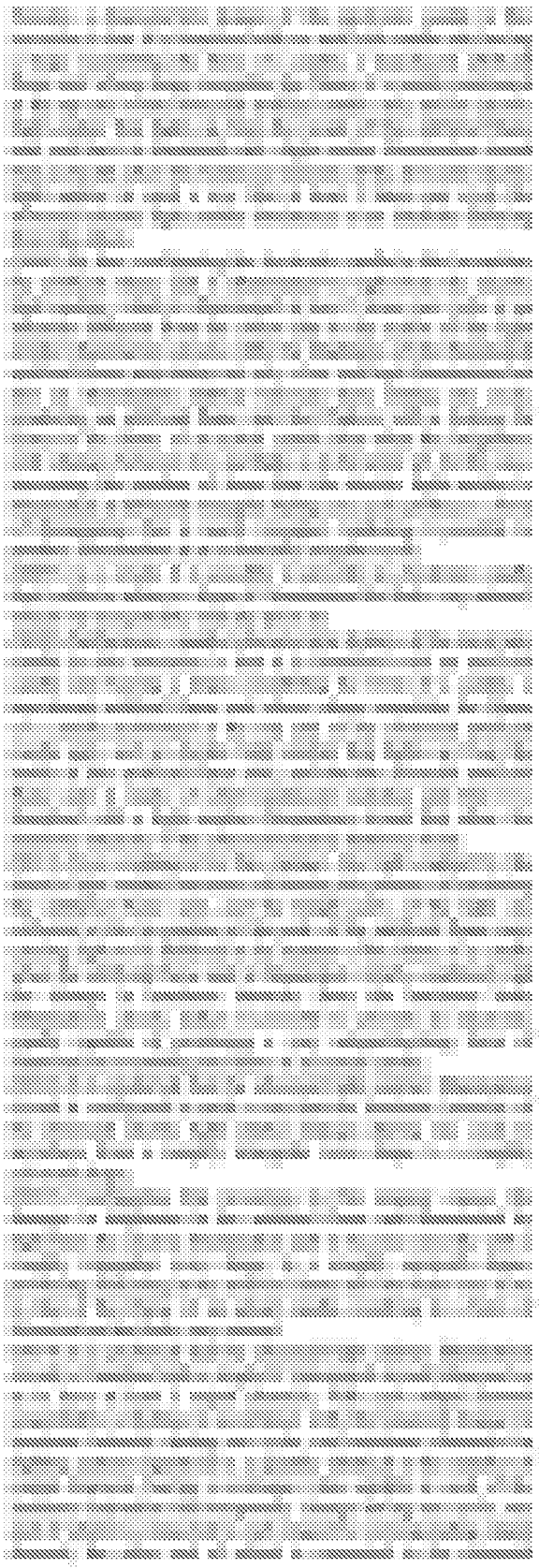
Commissioner of the Patent Office Yoshinori Komiya
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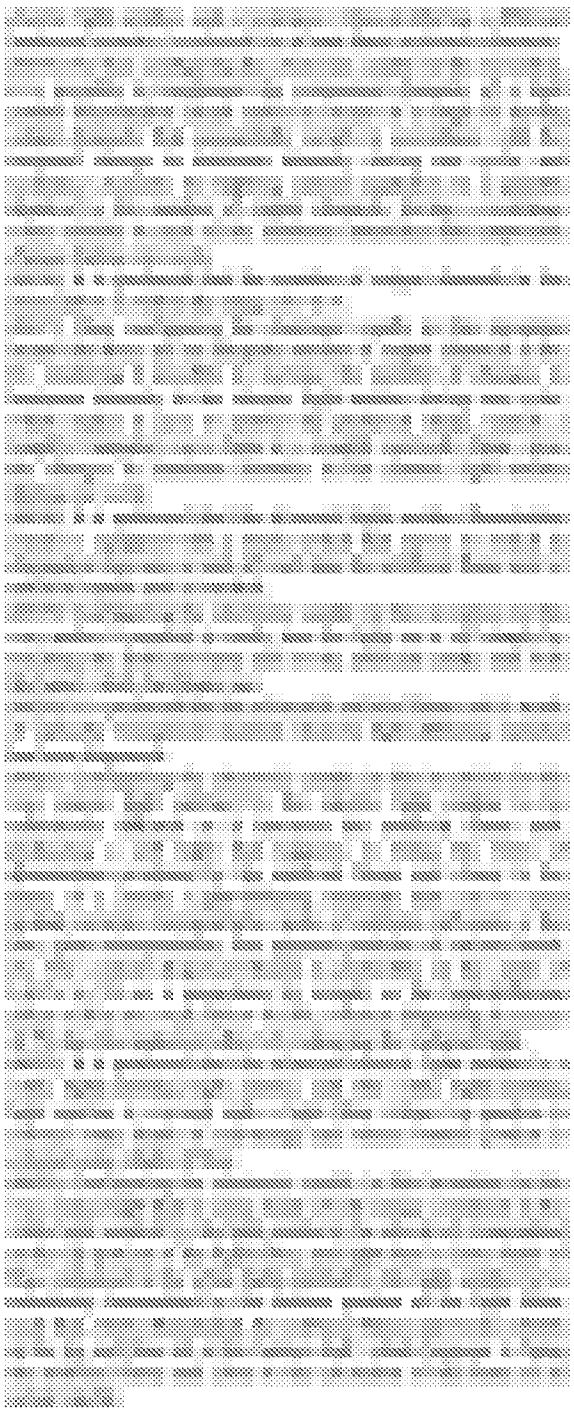
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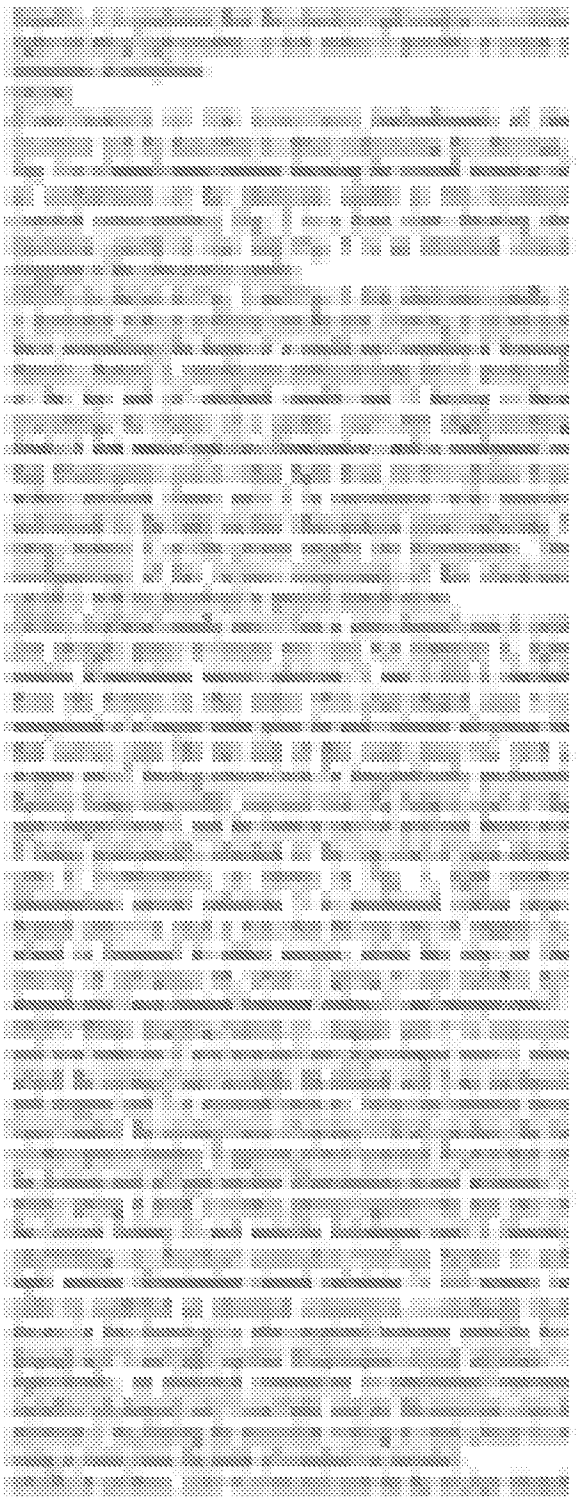
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Exhibit 1005-00003 Page 364

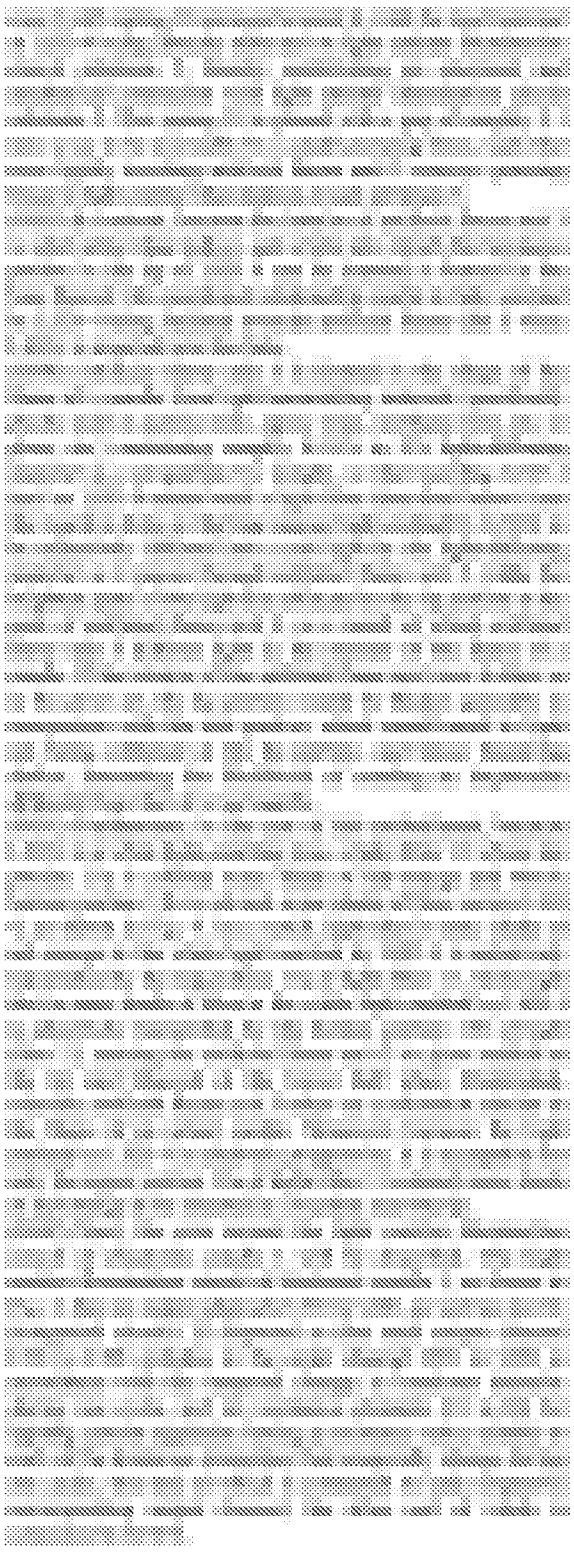














Moreover, the change in luminous intensity is not limited to the roughly triangular wave shape to roughly sawtooth shape indicated in Figs. 6 and 7, and any of various changes, including even more complex changes, can be used.

(0044) (3) In the case of electronic candle 1 in the embodiment described above, an example was cited wherein a stopper 7 with a laterally perforated narrow hole 7a was removably screwed onto the bottom end of pipe-shaped case 6, but it is also acceptable to instead use a permanent stopper 7 and to form on the interior thereof a support of adequate strength to withstand the needle T of candle holder BS being pushed firmly against it. This method is preferred in that it improves the durability of the electronic candle in this invention. In this case, battery E is replaced via the sub-piece 6b at the top of pipe-shaped case 6.

(0045) (4) In the case of electronic candle 1 in the embodiment described above, an example was cited wherein a touch switch SW was provided so that illumination would be turned alternately on and off every time the artificial flame unit 3 or the artificial candle unit 2 was touched with the hand, but it naturally goes without saying that it is acceptable to alternately make it possible to perform this operation by touching only one of these. It is also acceptable to provide a normal press switch on the artificial candle unit rather than a touch switch SW utilizing a spring capable of being moved by small pressing force.

(0046) (5) For the configuration of the artificial flame unit 3 in the embodiment described above, an example was cited wherein light-diffusing material was mixed into the optically transparent material, but it is also acceptable, either in addition to or in place of this, to render the artificial flame unit capable of emitting diffuse light by forming minute bumps on the surface in the manner of ground glass.

(0047) (6) In the electronic candle in this invention, the form of change in the luminous intensity of the LED during one cycle as well as the size and shape of the artificial candle unit and artificial flame unit, type of IC, etc., are not limited to those set forth in this embodiment, and may be altered to any other suitable form on an as-needed basis.

(0048) (7) In the embodiment described above, an example was cited that utilizes a white light-emitting LED in order to create a luxurious feeling, but this invention is not limited thereto, and an LED emitting any of various colors may be used. In other words, an LED color should be selected appropriately based on the usage location, application, etc.

(0049) (8) In the electronic candle 1 in the embodiment described above, an example was cited that utilized a battery as the power supply for LED 4, but power may alternately be obtained from an AC line.

(BRIEF DESCRIPTION OF THE REFERENCES)

(FIG. 1) Lateral cross-section showing the overall structure of an embodiment of the electronic candle in this invention

(FIG. 2) Front view showing a usage example of the electronic candle in Fig. 1

(FIG. 3) Electrical circuit diagram of the electronic candle in Fig. 1

(FIG. 4) Front view showing the light filter placed over the LED of the electronic candle in Fig. 1

(FIG. 5) Graph showing an example of luminous intensity change in an LED in the electronic candle in Fig. 1

(FIG. 6) Graph showing another example of luminous intensity change in an LED in the electronic candle in Fig. 1

(FIG. 7) Front view showing the basic structure of a prior-art electronic candle

(FIG. 8) Graph showing luminous intensity change in an LED in a prior-art electronic candle

(FIG. 9) Electronic circuit diagram for a prior-art electronic candle

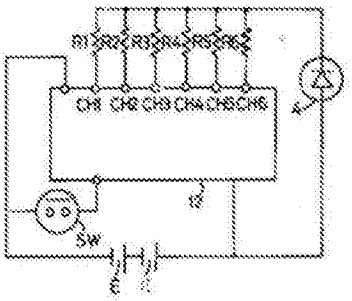
(DESCRIPTION OF THE REFERENCES)

1	Electronic candle
2	Artificial candle unit
3	Artificial flame unit
4	Electrical light emitter
5	Light emitter illumination circuit substrate
11	Light filter
11a	Top side
11b	Bottom side
12	IC
CH1 to CH6	Output channel
IA to IC	Luminous intensity
I1 to I6	Luminous intensity
R1 to R6	Resistance element
SW	Touch switch

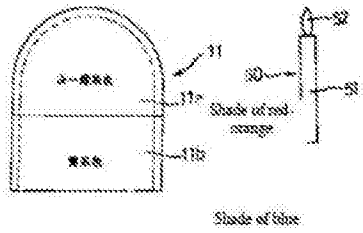
(FIG. 2)



(FIG. 3)



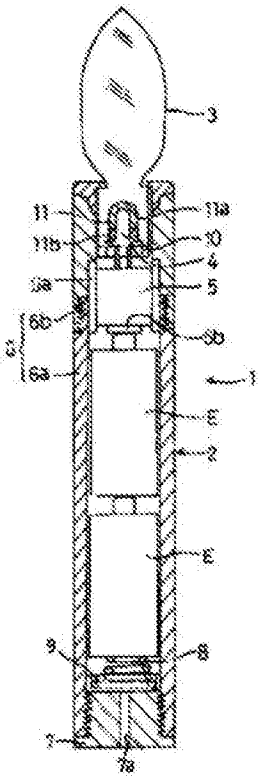
(FIG. 4)



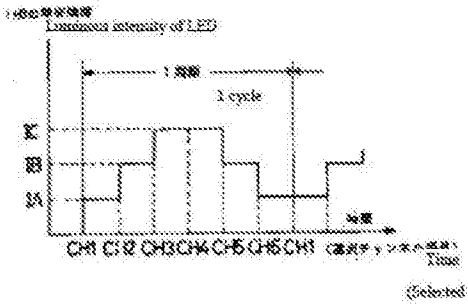
(FIG. 7)

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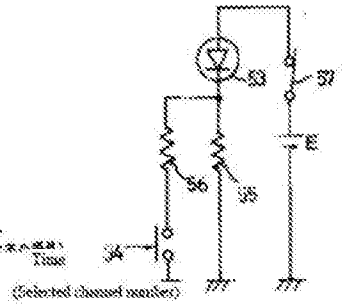
(FIG. 1)



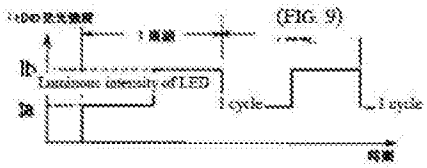
【図5】 (FIG. 5)



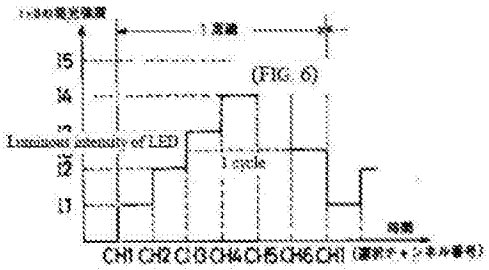
【図8】 (FIG. 8)



【図9】



【図6】



Continued from the front page

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証 明 請 求 書

平成２９年　１月３０日

特許庁長官　　殿

１．事件の表示

特願２０００－１０８２６８

２．請求人

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３．証明に係る書類名

公開特許公報（特開２００１－２９１５９８）

証明に係る書類名に記載した事項について相違ないことを証明してください。

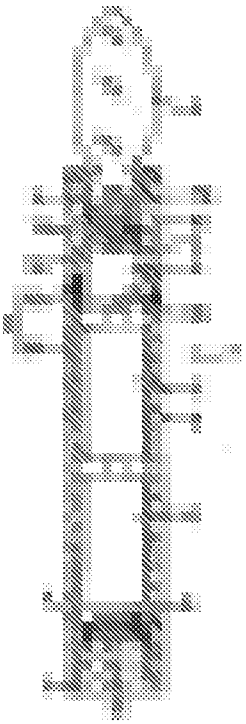
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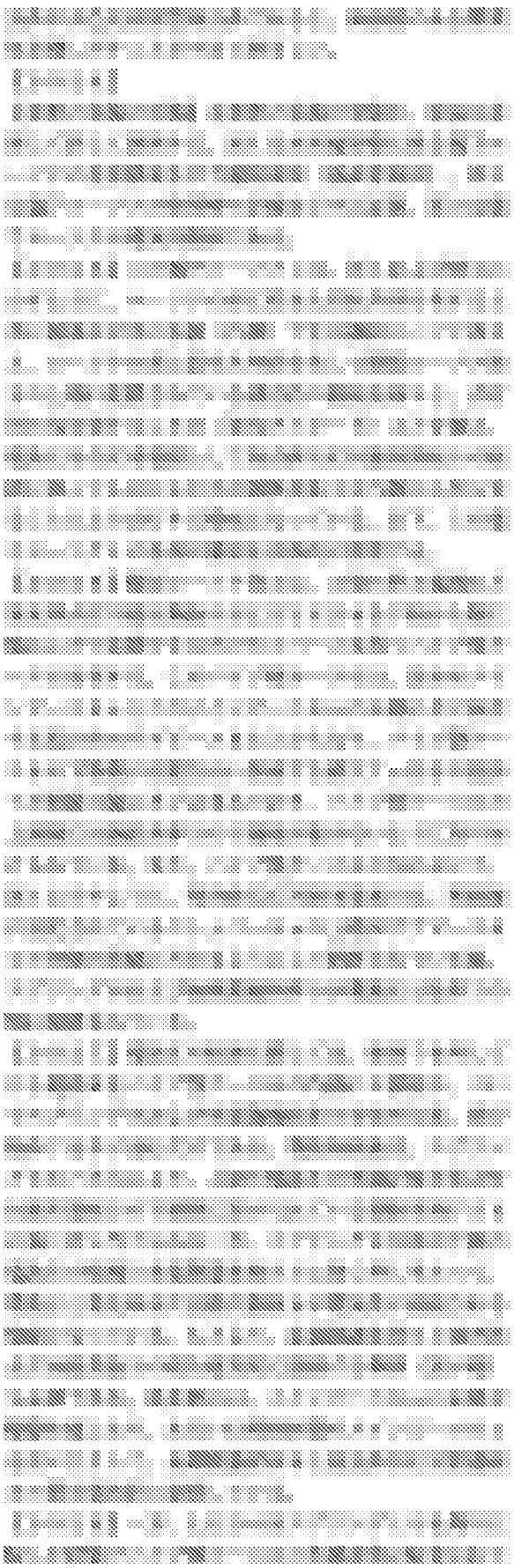
平成２９年　２月　７日

特許庁長官　　小宮義則

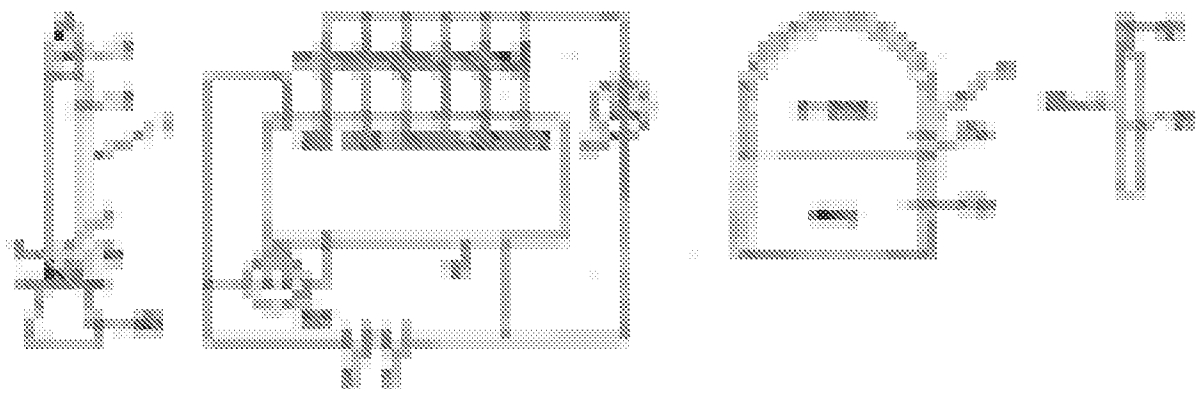
平成２９年出証第６００４７号

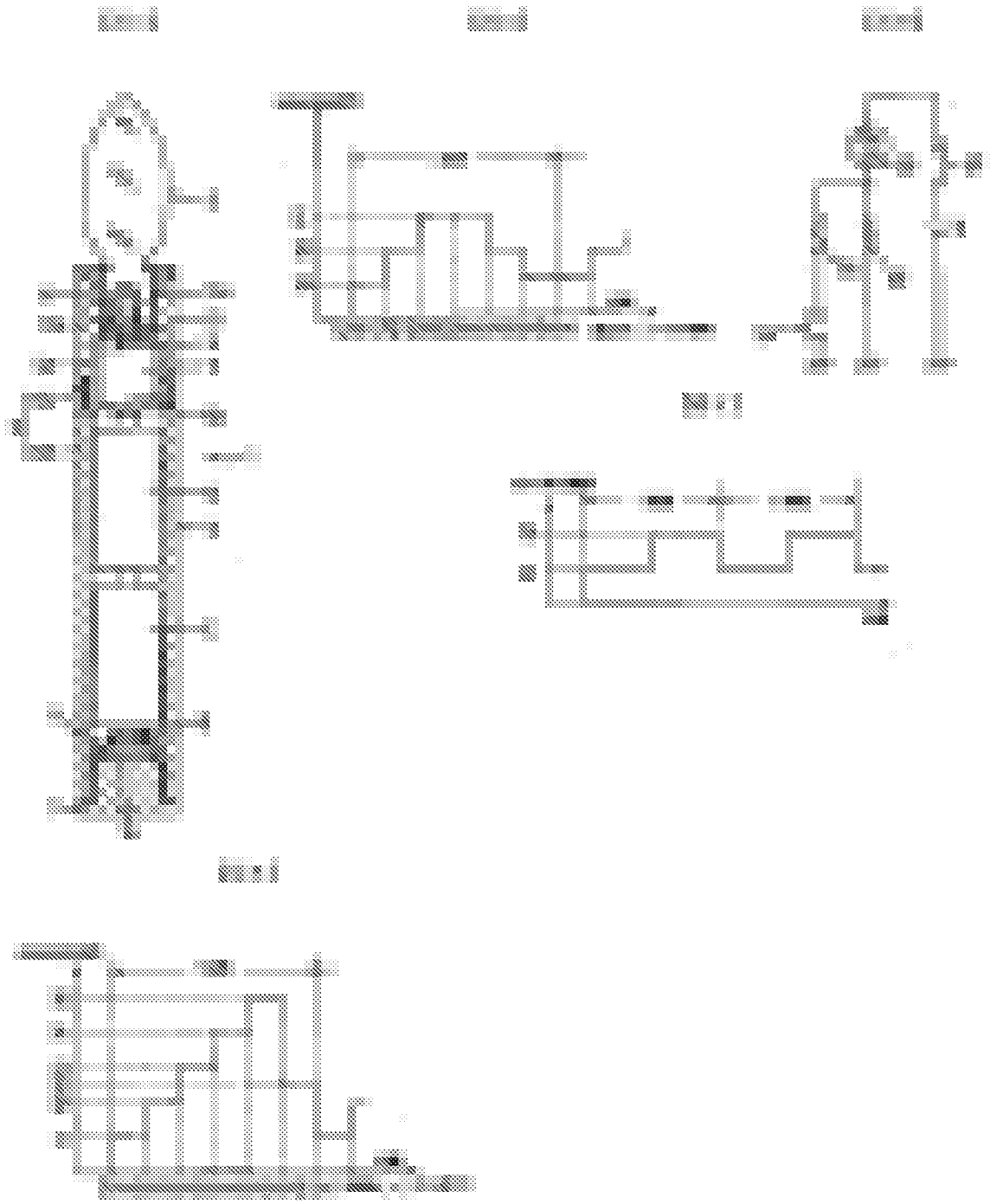
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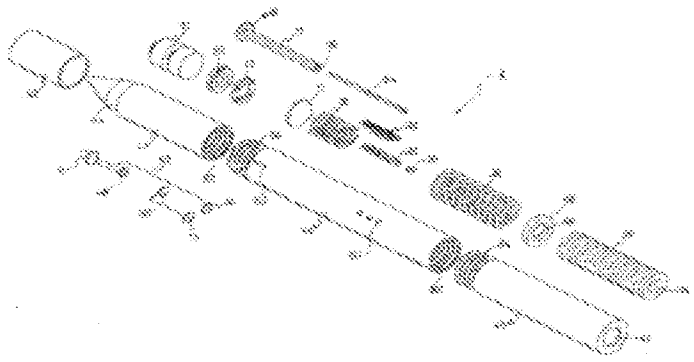
Examination requested: Yes

(54) Electronic cigar

Abstract

The present invention provides an electronic cigarette, which, each time a smoker inhales air, gives off light and fragrance, giving the feeling of smoking and helping a smoker to quit smoking; in addition, by additionally providing sounds that give a psychological sense of stability and have a therapeutic effect and by inhalation of a health auxiliary that promotes or assists in physical and mental health, it ultimately seeks to support the health for habitual smokers and thereby allowing all smokers, including patients with nicotine poisoning, to have great assistance in quitting smoking.

Representative drawing



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Key words

Electronic cigarette, LED, battery cell, piston switch, sound generator, health auxiliary

Specification

Brief Description of the Drawings

Figure 1: An overall oblique view of the present invention

Figure 2: An exploded oblique view of the present invention

Figure 3: A sectional view before a piston switch action is performed in the present invention

Figure 4: A sectional view after a piston switch action is performed in the present invention

Figure 5: A sectional view of another embodiment of the present invention

Figure 6: A sectional view of an embodiment of the body connection portion according to the present invention

Figure 7: A sectional view of another embodiment of the present invention

Figure 8: An exploded view of another embodiment of the present invention

Figure 9: Circuit diagram for an embodiment of the present invention

<Description of the main symbols shown in the drawings>

(2) – Electronic cigarette (4), (4a), (4b) – Body

(6) – LED (8) – Lamp chamber

(10) – Battery cell (12) – Battery chamber

(14), (15) – Movable contact (16), (34), (88) - Vent

(18) – Piston switch (20), (38) - Spring

(22) – Fixed contact (24) – Piston chamber

(26) – Sound generator (28) – Speaker

(30) – Switch (32) – Receiving chamber

(36), (90) – Health auxiliary (preferential component) (40) – Receiving chamber

(42) – Cap (43) – Outlet

(44) – Narrow orifice portion (46) – Support bar

(48) – Positive terminal (50) – Negative terminal

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(52), (54), (56) – Wire (58) – Moving chamber

(60) – Through hole (62) – Air supply hole

(64) – Fragrant body (66) – Through hole

(68) – Isolating plate (70), (72) – Joint portion

(74), (76) – Projecting frame (78), (80) – Recessed groove

(82), (84) – Thread (86) – Pipeline portion

(92) – Joint hole

Detailed Description of the Invention

Purpose of the Invention

Technical Field and Prior Art

The present invention relates to an electronic cigarette that resembles a cigarette in shape; more specifically, when a smoker inhales air, the electronic cigarette gives off light and fragrance, giving the feeling of smoking and helping a smoker to quit smoking; in addition, by additionally providing sounds that give a psychological sense of stability and have a therapeutic effect and by inhalation of a health auxiliary that promotes or assists in physical and mental health, it ultimately seeks health for habitual smokers and thereby allowing all smokers, including patients with nicotine poisoning, to provide great assistance in quieting smoking.

Generally, smoking cigarettes is a hobby, but it is well known that they can cause fatal diseases. However, it is difficult for smokers to break away from chronic smoking because of their diverse social life and interpersonal relationships. In particular, a cigarette contains many kinds of carcinogenic substances, such as nicotine, tar and other harmful components. These components not only lead to lung cancer or respiratory diseases (laryngeal cancer and thromboangiitis obliterans caused by vascular contraction) and other diseases, and even death; moreover, they will subject people close by to second-hand smoking.

Therefore, stop smoking campaigns are widely carried out in society. However, for smokers who are addicted to smoking, it is difficult to quit smoking because of its toxicity and habituation, and the effectiveness is poor.

Therefore, in recent years, in addition to the above-mentioned smoking pipes, many other aids, such as cigarettes and smoking aid pipes for quitting smoking, have also been developed.

Smoking cessation means making a smoker feel bitter when he or she smokes or removing the unique aroma of cigarettes so that addicts gradually lose the desire to smoke, thereby causing them to quit smoking.

In addition, a smoking cessation aid pipe is provided with a filter containing various kinds of substances that can react with the smell of smoke. When a smoker smokes, nicotine and tar is filtered out. This can, to a certain extent, filter out harmful components in cigarettes. However, the effect of immediately refusing cigarettes for smoking cessation by the filter function is still unsatisfactory.

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Moreover, with the increase in use time, filter replacement is needed, and the costs of replacement increase. With the growing popularity of smoking cessation in society, a great deal of functional foods for reducing smoking hazards have been developed in health assistance by tobacco cessation and smoking cessation. For example, functional gums, functional sugars, functional drinks and other commodities have been introduced to inhibit the conversion of nicotine into carcinogenic substances in the body and alleviate toxic and withdrawal symptoms, thereby helping smoking cessation.

In addition, after the launch of a gum emphasizing the effect of preventing tooth decay, the candy industry launched the "dutiful son commodity", which is a gum that can help quit nicotine, gradually reducing nicotine intake through the skin; the market share of patches that help with smoking cessation is also on the rise.

Summary of Invention

Therefore, the present invention departs from the R&D investment framework of a smoking cessation health assistance company that adhered to smoking cessation. Based on human smoking psychology and with creative thinking, the present invention provides a highly functional cigarette substitute suitable for the new century – electronic cigarette, letting habitual smokers get rid of the harm brought by cigarettes, thereby allowing smoke addicts to gradually get rid of harm caused by cigarettes by taking advantage of an electronic cigarette according to the present invention. It not only has the effect cutting off contact with harmful cigarettes, but also is conducive to national health and human health.

In order to achieve the above objective, each time a smoker inhales air, the electronic cigarette gives off light and fragrance, giving the feeling of smoking and helping a smoker to quit smoking; in addition, by additionally providing sounds that give a psychological sense of stability and have a therapeutic effect and by inhalation of a health auxiliary that promotes or assists in physical and mental health, it ultimately seeks health for habitual smokers and thereby allowing all smokers, including patients with nicotine poisoning, to provide great assistance in quitting smoking.

In addition, the present invention differs from conventional cigarette substitutes, smoking cessation health assistance in development and promotion direction. From the scientific and actual perspectives, it is close to the smoking population, divided into "for young people", "for women", "for men", "for smoking cessation", and so forth. By specialty, it is close to the smoking population psychologically. A product according to the present invention adopts a beautiful design and an electronic sound generation function not available in conventional cigarettes, making it become smokers' new hobby. Also, for the problem of cigarette poisoning, by cigarette imitation and intimacy of an electronic cigarette, hazards of smoking are reduced.

Structure and Operation of the Invention

Preferred embodiments of the present invention are described in detail with the accompanying drawings.

Figure 1 shows an overall oblique view of an electronic cigarette of the present invention (2). Figure 2 shows an exploded oblique view of it. Figure 3 shows a sectional view thereof.

The electronic cigarette of the present invention (2) is a cylinder of the same size as or similar to a general cigarette and obviously can be thickened like a cigarette.

The bodies (4), (4a), and (4b) forming the shape of the electronic cigarette (2) are made of synthetic resin or a metal, divided into a plurality of components that can be stuck securely in the longitudinal direction of the bodies (4), (4a), and (4b) or disassembled and assembled by screws for fastening.

In addition, preferably, the body (4) and (4a) located at the front and in the center is made of a hard material, equivalent to a filter; the rear body (4b) coming into contact with the user's mouth is made of a soft material, thereby avoiding resistance due to hardness in use.

However, in order to obtain a design with a more high-end aesthetic sense, the rear body (4b) equivalent to a filter is made of gold that is completely harmless to the human body and provides a sense of intimacy and high class, or is coated with a layer of gold (or gold-plated). In addition, the bodies (4) and (4a) at the front end and in the middle are made of silver or coated with a layer of silver (or silver-plated), adopting an exquisite design not available in conventional cigarettes; in such cases, the rear body (4b) is to be made of a hard material.

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In addition, the bodies (4), (4a), and (4b) can, by radiating far infrared rays, provide ceramics, medical stone, jade, tourmaline, and so forth,. beneficial to the human body and the surrounding environment for manufacturing and processing.

Additionally, a lamp chamber (8) is formed in the front end of the bodies (4), (4a), and (4b), the lamp chamber (8) being provided with an LED (6) that replaces a flame. The rear end of the lamp chamber (8) comprises a battery chamber (12) for mounting more than one small battery cell (10) and a battery cell (10) contact terminal and an isolating plate (11); piston chambers (24) respectively provided with piston switches (18), springs (20), and fixed contacts (22); receiving chambers (32) respectively provided with a sound generator (26), a speaker (28), and a switch (30); a receiving chamber (40) provided with a health auxiliary (36) with an air vent (34) and a spring (38) for bouncing off the health auxiliary (36); a transparent or translucent cap (42) joined to the front end of the electronic cigarette (2); and a plurality of air passages and an outlet (43) for circulating air that passes or is inhaled through a vent.

Further, the piston switch (18) comprises the movable contacts (14) and (15) fixed to an insulator (13); vent holes (16); a distribution portion, a rod portion (17), and a vent hole (16); the front end of the spring (38) is inserted into the connection groove for fixation.

The front end of the body (4) is made of a transparent or translucent material that lets out the light given off by the LED (6), formed by a narrow orifice portion (44) provided with the cap (42) that can be easily disassembled and assembled; the closer it is to the front end, the smaller the diameter is.

The LED (6) that replaces a cigarette flame is made of a yellow diode or a red diode to maximally represent the yellow color of a cigarette flame.

For the yellow diode close to a cigarette flame, in the production and processing of the cap (42) and the body (4) combined with the cap (42), a transparent or nearly transparent color is used for coloration or pigment mixture to represent a color the same as soot.

In addition, when a red LED is used, in the production and processing of the cap (42) and the body (4) combined with the cap (42), the yellow color or a color close to yellow is used for coloration or pigment mixture, or a filter is installed, for giving off (lighting up) light to the closest extent to that of a cigarette flame.

In addition, a support bar (46) fixed to the body (4) is formed between the wires of a pair of LEDs (6) to support the LEDs (6) in such manner that they do not separate.

The battery chamber (12) is provided with a positive terminal (48) that comes into elastic contact with the positive terminal of the battery cell (10) and a negative terminal (50) that comes into elastic contact with the negative terminal of the battery cell (10); the positive terminal (48) is connected with a wire on one side of the LED (6); the negative terminal (50) and a lead wire on the other side of the LED (6) are respectively connected with the movable contacts (14) and (15) by way of the wires (52).

The fixed contact (22) is integral; the movable contacts (14) (15) are divided into two parts that remain insulated; they are switches that are turned on (ON) by the mutual contact between the fixed contact (22) and the movable contacts (14) and (15) and turned off (OFF) by separation between them.

Therefore, when a user holds in his/her mouth the outlet (43) portion of the electronic cigarette (2) and inhales air, by the attractive power, the piston switch (18) as shown in Figure 3 goes backs; the fixed contact (22) comes into contact with the movable contacts (14) and (15); the negative terminal (50) and a wire on the other side of the LED (6) are electrically connected for power-on; thus, the LED (6) emits light.

In addition, the positive terminal (48) and the negative terminal (50), by the wires (54) and (56), are respectively connected with the power input terminal of the sound generator (26); the speaker (28) and the switch (30) on the sound generator (26) respectively come into contact.

The bodies (4), (4a), and (4b) are disassembled and assembled by hard plug-in or fixation with screws, and a power input line may be short-circuited (a short circuit). However, as shown in Figure 9, the power input line maintains connected properly.
This structure is generally the most applied, and so it is not detailed herein.

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Further, according to the present invention, a battery cell for making the LED (6) light up and a battery cell for driving the sound generator (26) are respectively built in the bodies (4) and (4a) for internal use; in this case, as shown in Figure 5, the battery chamber (12) and the receiving chamber (32) can be installed separately.

Certainly, when the battery cell (10) is used currently, the battery chamber (12) and the receiving chamber (32) are interconnected or made adjacent to each other.

Further, when the battery cell (10) is almost fully discharged, after separation of the front end and central portion of the bodies (4) and (4a), the fully discharged battery cell is removed, and a new battery is installed in the battery chamber (12); then, the rear end and central portion of the bodies (4) and (4a) can be simply combined.

The sound generator (26) comprises a memory portion that converts audio data, such as music, songs, and sounds, into digital signals for preservation; a D/A converter that, by the switch (30), converts a digital sound signal requested by the control portion into an analog signal for output; an amplifying portion that amplifies a signal output by the D/A converter into a strong signal and outputs it to the speaker (28) and a control portion for controlling them. Such a sound generator (26) is suitable for various industrial fields, and a detailed explanation is omitted. .

Further, the receiving chamber (32) fixing the speaker (28) is provided with a plurality of through holes (60) connected to the outside of the body (4a), directly transferring the sound generated by the speaker (28) to the outside of the electronic cigarette (2).

In order to facilitate user operation, the button of the switch (30) protrudes out of the body (4a). When the switch (30) is pressed, the sound generator (28) starts running, and the sound is output by the above-described process.

In the present invention, during the use of the electronic cigarette (2), if the user does not inhale any air, like smoking, the LED (6) emits a faint light, presenting an environment the same as that of smoking a common cigarette, by changing the light intensity of the LED (6), proportional to that of the inhalation strength thereof, so that the user enjoys a stronger sense of intimacy.

The sound generator (28) properly runs only when triggered by the switch (30). In any other time, it is best to cut off the power supply or provide only weak standby power, thus preventing unnecessary battery discharge.

The sounds include meditative music, songs, light marches, pop songs, or sounds that meet various consumer demands.

For example, when the electronic cigarette (2) is used in the morning, the switch (30) can be pressed once to output lively songs or music to the speaker (28); at lunch time or activity time, the switch (30) can be pressed twice to output popular songs and the like to the speaker (28); before going to bed, the switch (30) can be pressed three times to output meditative music or meditative sounds to the speaker (28) to achieve psychological stability and a therapeutic effect.

In other words, by specific music, suggestion, or recitation, psychological stability and a psychological treatment effect can be achieved.

Further, the sound generator (26) is provided with an additional inversion function or trigger circuit. Without the need of pressing the switch (30) continuously, by pressing it for 1 second to 2 seconds, an audio, song, music, or sound can be output or is completed.

Further, after the switch (30) is pressed for 3-4 seconds, the sound generator (26) stops running. As needed, the action state of the sound generator (26) can be stopped. It can be pressed for 5-6 seconds to set the sound or select the output of sound, audios, or music, or change the sequence of sounds, music, or audio.

Further, these are only examples, and it is obvious that a variety of sound, audio, or music changes and functions can be set up, according to user requirements.

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In one aspect, the piston chamber (24) is provided with a plurality of air supply holes (62) connected to the outside of the body (4a); a front and back opening vent (16) is formed in the center of the longitudinal direction of the piston switch (18); the peripheral surface of the piston switch (18) maintains a distance for being nearly in contact with the inner circumferential surface of the moving chamber (58) so that the piston switch (18) can move forward and backward without significant resistance.

The cross section of the vent (16) is much smaller than the total cross section of the air supply hole (62); when a suction force acts on the outlet (43), the forward piston switch (18) exceeds the tension of the spring (20) and pushes backward.

Therefore, usually, as shown in Figure 3, by the pull of the spring (20), the piston switch (18) advances towards the front end of the piston chamber (24). When a user holds in his/her mount the outlet (43) portion of the electronic cigarette (2), if the inhaled air strength is greater than the pull by the spring (20) of the piston switch (18), as shown in Figure 4, the piston switch (18) retreats, and the fixed contact (22) is electrically connected with the movable contacts (14) and (15); as mentioned previously, when the power of the battery cell (10) is input to the LED (6), light is given off.

Further, in the air supply hole (62), vanilla aromas, cinnamon, mint, tobacco flavor substances, and other fragrances or spices conducive to health and smoking cessation are provided alone or in mixture, which are added to the fragrant body (64) made of sponge or cotton and sealed with liquid or powder to give off these fragrances.

Fragrant bodies (64) that can be easily replaced on the air supply hole (62) can be used, and may be omitted according to user needs. For fragrances, various aromatics (light-emitting agents) that meet user needs can be used.

In one aspect, a plurality of health auxiliaries (preferential) (36) installed at the rear end of the receiving chamber (38) are in the doughnut shape of the vent (34) that forms central air circulation, which is a preferential type very easily melted by saliva, close to the outlet (43) with a larger inner diameter; when in contact with a user's saliva and tongue, it is melted into the mouth before being eaten or drunk.

The health auxiliary (34) can be health auxiliary foods mixed in a proper proportion and having pharmacological effects conducive to the body, such as calcium, vitamins, diet foods, pharmaceutical products with therapeutic effects on specific diseases (physiological medicine or traditional Chinese medicinal agents), other health food powder and spices and other additives processed into solids easily melted by saliva.

In one aspect, withdrawal symptoms occur because nicotine replaces neurotransmitters, eventually increasing the dopamine levels in the brain and exciting the pleasure centers. Therefore, when the nicotine decreases to a certain level, the pleasure centers decline and thus psychological displeasure occurs.

Further, caffeine, which improves one's mood, promotes blood circulation, and has an effect on the respiratory organs, is like nicotine. Although it is habitual, it increases the dopamine levels in the brain, exciting the pleasure centers. Therefore, after mixture with an appropriate amount of spices for curing, it can be used as a health auxiliary (36), according to the present invention, to maintain the excitement level of the brain or nervous system.

Further, even though the health auxiliary (36) melts by eating or drinking, by the elasticity of the spring (38), the health auxiliary (36) is pushed into the direction of the outlet (43), thus becoming close to the tongue.

When the health auxiliary (preferential component) (36) is completely or almost consumed, the bodies (4a) and (4b) at the rear end and in the center can be opened; a new health auxiliary (preferential component) (36) can be added to the receiving chamber (40); the bodies (4a) and (4b) can be assembled again for use.

A through hole (66) is formed between the spring (38) and the health auxiliary (36), in which a sanitary hard insulating plate (68) is inserted.

As shown in Figure 5, the receiving chamber (32) provided with the sound generator (26), the speaker (28), and the switch (30) is moved and installed near the battery cell (10) or the battery chamber (12) to reduce the wires of power input, ensuring that the wire connection is proper.

Further, as shown in Figure 3, the spring (20) of the piston chamber (24) is moved and installed to the moving chamber (58) provided with a narrow orifice portion (66) , elastically supporting the piston switch (18).

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Further, as shown in Figure 6, by hard plug-in, the connection parts of the bodies (4), (4a), and (4b) are disassembled and assembled. The ends of the bodies (4), (4a), and (4b) are respectively provided with joint portions (70) and (72) having the same inner diameter and outer diameter; the ends of the joint portions (70) and (72) are respectively provided with projecting frames (74) and (76); recessed grooves (78) and (80) are formed circumferentially to engage with and seize the projecting frames (74) and (76); thus, the bodies (4), (4a), and (4b) can be easily disassembled and assembled by hard plug-in.

The joint portions (70) and (72) are of a symmetrical male and female combinational structure. If the bodies (4), (4a), and (4b) are fixed by combination with screws, as shown in Figure 2, the ends of the bodies (4), (4a), and (4b) are respectively provided with threads (82) and (84) with a male and female fixed structure.

Figure 7 and Figure 8 respectively show an exploded oblique view and a sectional view of an electronic cigarette (2a), according to another embodiment of the present invention.

The composition of the electronic cigarette (2a) is substantially the same as that of the above-described the electronic cigarette (2), except that the rear end of the body (4a) is extended to form a pipeline portion (86), and a vent (88) is formed in the longitudinal direction of the pipeline portion (86); a health auxiliary (90) is inserted from the outside of the pipeline portion (86) so that it can be removed.

The health auxiliary (90) is provided with a joint hole (92) in the longitudinal direction, for combination with the pipeline portion (86). As shown in Figure 7 and Figure 8, it can be integral; alternatively, as shown in Figure 2 to Figure 5, from the outer peripheral surface of the pipeline portion (86), the vent (34) portion using a doughnut-shaped health auxiliary (36) is inserted.

The composition of the health auxiliary (90) is the same as that of the health auxiliary (36) described earlier. It can be melted by a user's saliva or tongue before being eaten or drunk, or it can be eaten as a tubular sausage or a gelatinous chew. When the health auxiliary (90) is completely or nearly consumed, a new health auxiliary can be simply inserted for use. In addition, since the health auxiliary (90) leaks to the outside, it is convenient to eat or drink.

The cylindrical bodies (4), (4a), and (4b) of the present invention have a length or diameter the same as or similar to those of a common cigarette, and resemble a common cigarette.

Further, when it is in use, like smoking a common cigarette, the outlet (43) portion is held in the mouth and air is inhaled; through the supply hole (62) formed in the body (4a), air outside the body (4a) is inhaled into the human body.

The air circulation process is as follows: Air inhaled through the air supply hole (62) in the body (4a) passes through the piston chamber (24) → the vent (16) → the receiving chamber (32) → the receiving chamber (40) → the vent (34) → the outlet (43), and flows into the oral cavity of the user. In this process, the piston switch (18) moves back; the separated fixed contact (22) comes into contact with the movable contacts (14) and (15), constituting a return circuit; the power of the battery cell (10) is input to the LED (6), and the LED (6) lights up and emits light.

Further, based on the inhalation strength, the luminosity of the LED (6) varies depending on the contact force and contact resistance of the fixed contact (22) and the movable contacts (14) and (15).

That is, with the increase in the force of the inhalation by the user through the outlet (43), the contact resistance between the fixed contact (22) and the movable contacts (14) and (15) decreases, and so the luminosity of the LED (6) increases (with increased brightness); with the decrease in the inhalation force by the user, the contact resistance between the fixed contact (22) and the movable contacts (14) and (15) increases, and so the luminosity and brightness of the LED (6) decreases.

Therefore, as in actual smoking, a luminous effect is provided.

The resistance between the fixed contact (22) and the movable contacts (14) (15) can be achieved by covering the contact surface with a resistor having a large amplitude of variation in contact pressure.

In one aspect, light emitted by the LED (6) leaks through the front end and the cap (42) of the body (4) to create an atmosphere like actual smoking, naturally meeting the unconscious desire of smoking; therefore, an effect of relieving such dissatisfaction can be achieved.

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Further, an electronic cigarette according to the present invention differs from conventional cigarette substitutes, smoking cessation health auxiliary in development and promotion direction. From the scientific, actual, and psychological perspectives, it is close to the smoking population, divided into "for young people", "for women", "for men", "for smoking cessation", etc., making it become a new hobby; alternatively, the rear body (4b) equivalent to a filter is made of gold that is completely harmless to the human body and provides a sense of intimacy and high class, or is coated with a layer of gold (or gold-plated). In addition, the bodies (4) and (4a) at the front end and in the middle are made of silver or coated with a layer of silver (or silver-plated), adopting an exquisite design not available in conventional cigarettes.

Further, an electronic sound generating function is provided, giving people a psychological sense of stability and the effect of psychotherapy. The problem of smoking poisoning can be solved by a user's will power, cigarette imitation, and health auxiliaries. For the problem of habitual cigarette smoking, by cigarette imitation and intimacy of electronic cigarettes, harms of smoking can be reduced.

While specific preferred embodiments of the present invention are described above with drawings, the present invention is not limited to the above-described embodiments. Without departing from the spirit of the present invention, those of ordinary skill in art can certainly make various modifications and variations within a scope as defined by the technical idea of the present invention and the Claims recorded as follows.

Effects of the Invention

As mentioned above, the present invention provides an electronic cigarette as a cigarette substitute that is beneficial to the human body, especially to smoking cessation by habitual smokers, and also recommends the use of a product of the present invention in patients with nicotine poisoning, in order to achieve the purpose of gradual cure.

The present invention not only resembles an actual cigarette, but also provides a feeling the same as real smoking. Therefore, it not only helps get rid of harms caused by cigarettes, but also promotes health by health auxiliaries, naturally providing beneficial medicinal materials to the human body.

Further, the present invention achieves the effect of psychological stability and psychotherapy through specific music, suggestion, or recitation.

Further, as the present invention is detachable, consumptive dry batteries and fragrant bodies can be easily replaced and auxiliaries monitored.

Further, the present invention does not harm any people close by. When air is inhaled, the LED gives off light outside the body to create an atmosphere like actual smoking, naturally meeting the unconscious desire of smoking; therefore, an effect of relieving such dissatisfaction can be achieved.

Further, the present invention is a creative commodity close to human psychology, entirely different in nature from conventional cigarette substitutes. It can be produced with minimal investment, and therefore is highly economical.

Further, its exquisite design can arouse curiosity of and welcome by various consumer classes. For a non-smoker, smoking can be quit once and for all; for a smoker, smoking can be quit at a second time, and health auxiliaries (preferential components) that achieve the purpose of smoking cessation by psychotherapy are used at the same time, making it easier to quit smoking. As health auxiliaries can be eaten or drunk naturally, a dual purpose can be served.

(57) Scope of Claim

Claim 1.

An electronic cigarette, characterized in that: the body interior comprises a lamp chamber (8) provided with an LED (6); a battery chamber (12) provided with more than one small battery cell (10) and a battery cell (10) contact terminal; a piston chamber (24) provided with a piston switch (18) in which movable contacts (14) (15) and a vent (16) are formed, a spring (20), and a fixed contact (22); a receiving chamber (32) provided with a sound generator (26), a speaker (28), and a switch (30); a receiving chamber (40) provided with a health auxiliary (36) with an air vent (34) and a spring (38) for bouncing off the health auxiliary (36); a cap (42) coupled to the front end portion of an electronic cigarette (2); and a plurality of air passages and an outlet (43) for circulating air that passes or is inhaled through a vent.

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Claim 2.

The electronic cigarette as described in claim 1, characterized in that: the body is a combined structure which can be disassembled and assembled in the longitudinal direction and comprises a plurality of bodies (4), (4a), and (4b).

Claim 3.

The electronic cigarette as described in claim 2, characterized in that the rear body (4b) comprises a soft material.

Claim 4.

The electronic cigarette as described in claim 1 or claim 2, characterized in that: positive and negative terminals making contact with the battery cell (10), which are each connected with the power supply terminals of the sound generator (26) by way of wires (54)(56); and the sound generator (26) being in contact with the speaker (28) and the switch (30), respectively.

Claim 5.

The electronic cigarette as described in claim 5, characterized in that: the sound generator (26) comprises a memory portion that can convert audio data, such as songs, music, and other sounds, into digital signals for storing; a D/A converter that, by operating the switch (30), converts a digital sound signal requested by the control portion into an analog signal for output; an amplifying portion that amplifies a signal output by the D/A frequency converter into a powerful signal and outputs it to the speaker (28); and, a control portion.

Claim 6.

The electronic cigarette as described in claim 2, characterized in that the piston chamber (24) is formed with a plurality of air supply holes (62) connected to the outside of the body (4a); a front and back opening vent (16) is formed to and fro in the center of the longitudinal direction of the piston switch (18); the peripheral surface of the piston switch (18) maintains a distance of nearly touching the inner circumferential surface of the moving chamber (58) in order to enable front and back movement without significant resistance.

Claim 7.

The electronic cigarette as described in claim 6, characterized in that a fragrant body (64) is installed in the air vent (62).

Claim 8.

The electronic cigarette as described in claim 2, characterized in that joint portions (70) and (72) having the same outer diameter and inner diameter are formed at the ends of the body; the ends of the joint portions (70) and (72) are respectively provided with projecting frames (74) and (76); recessed grooves (78) and (80) are formed circumferentially to engage with and seize the projecting frames (74) and (76).

Claim 9.

The electronic cigarette as described in claim 2, characterized in that: the rear end of the body (4a) is extended to form a pipeline portion (86), and a vent (88) is formed in the longitudinal direction of the pipeline portion (86); a health auxiliary (90) can be disassembled and assembled in the outer part of the pipeline portion (86).

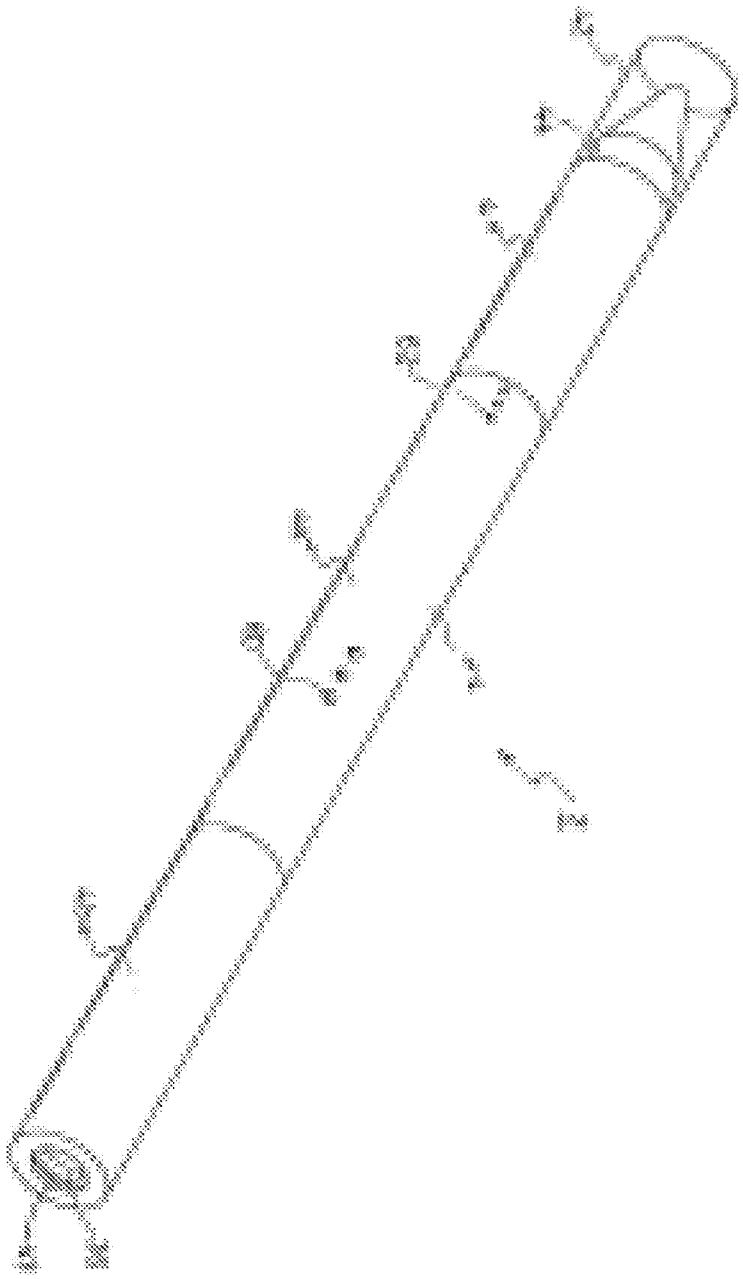
Claim 10.

The electronic cigarette as described in claim 1 or claim 2, characterized in that: the body (4a) is coated with a layer of silver, and the body (4b) is coated with a layer of gold.

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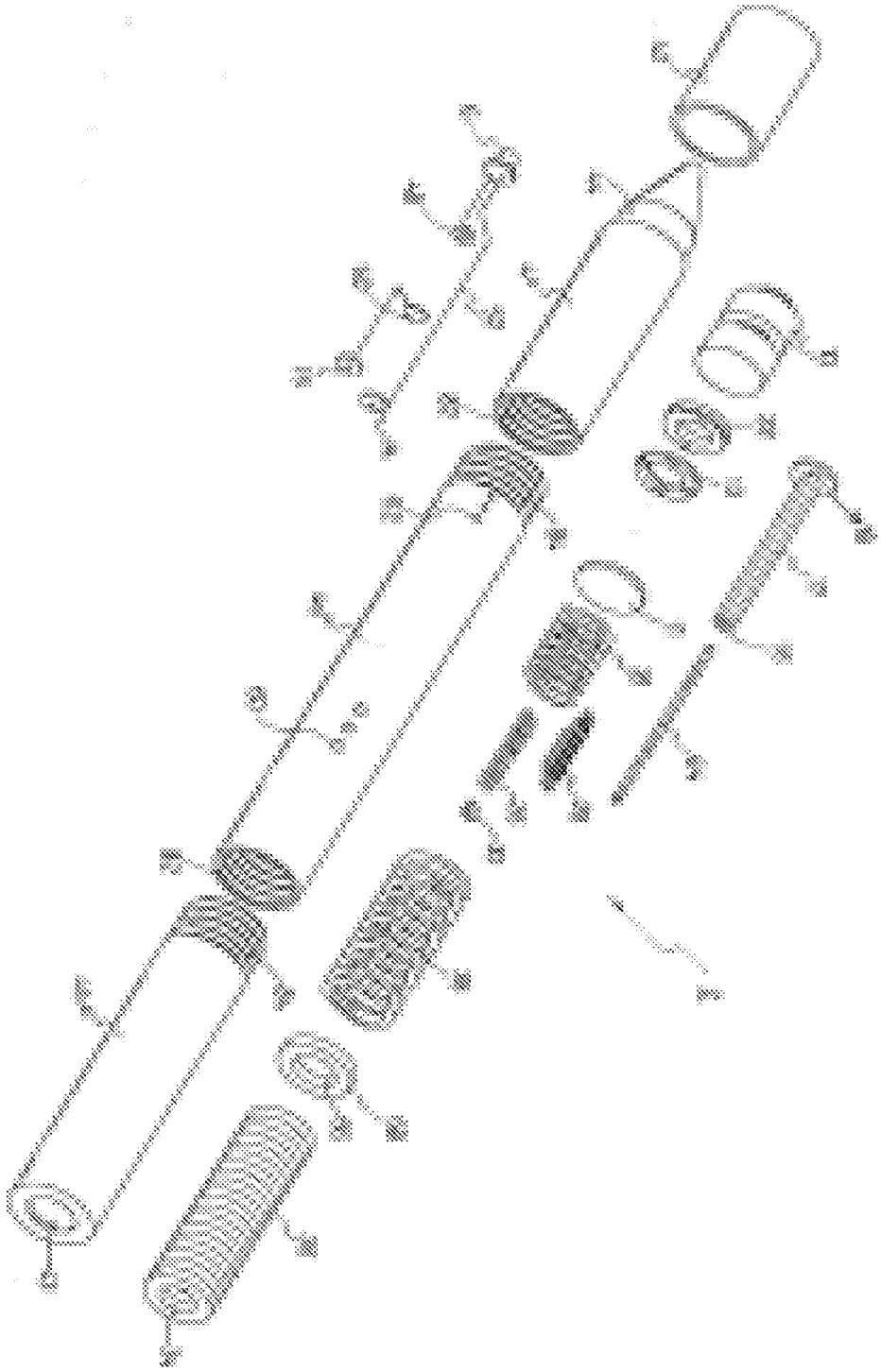
Figures

Figure 1



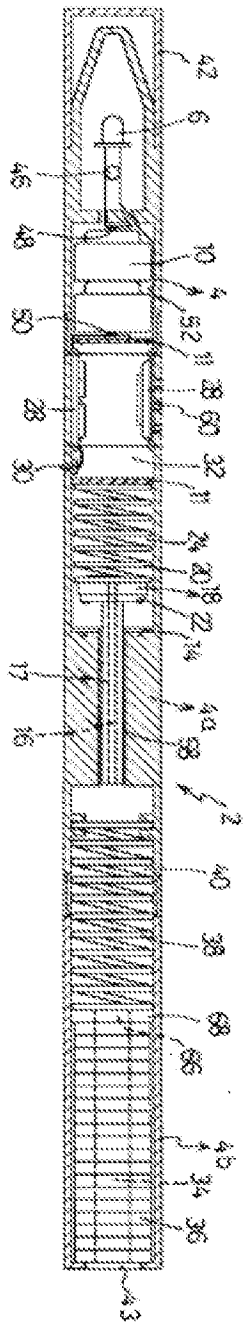
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Figure 2



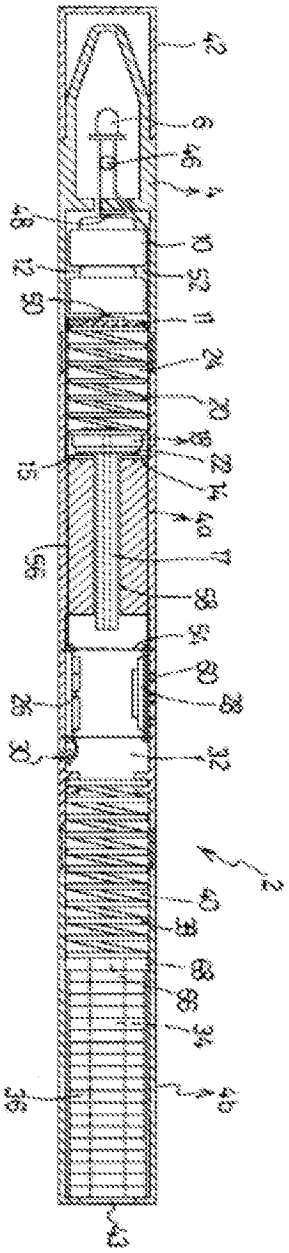
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Figure 3



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Figure 4



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Figure 5

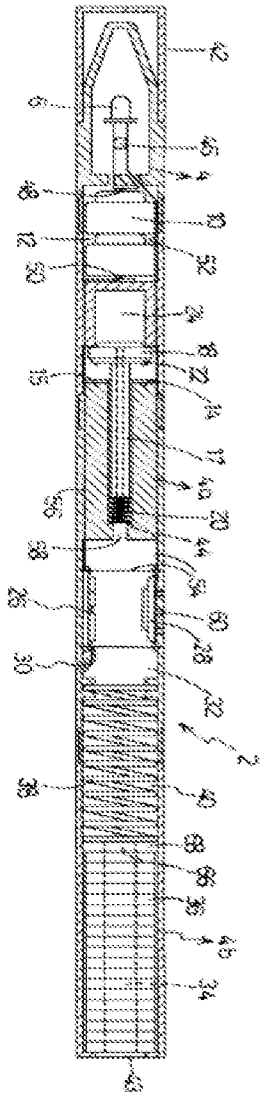
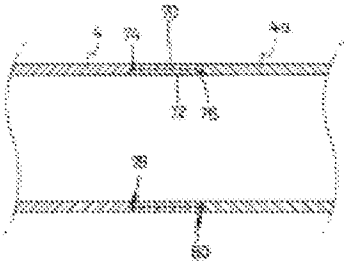
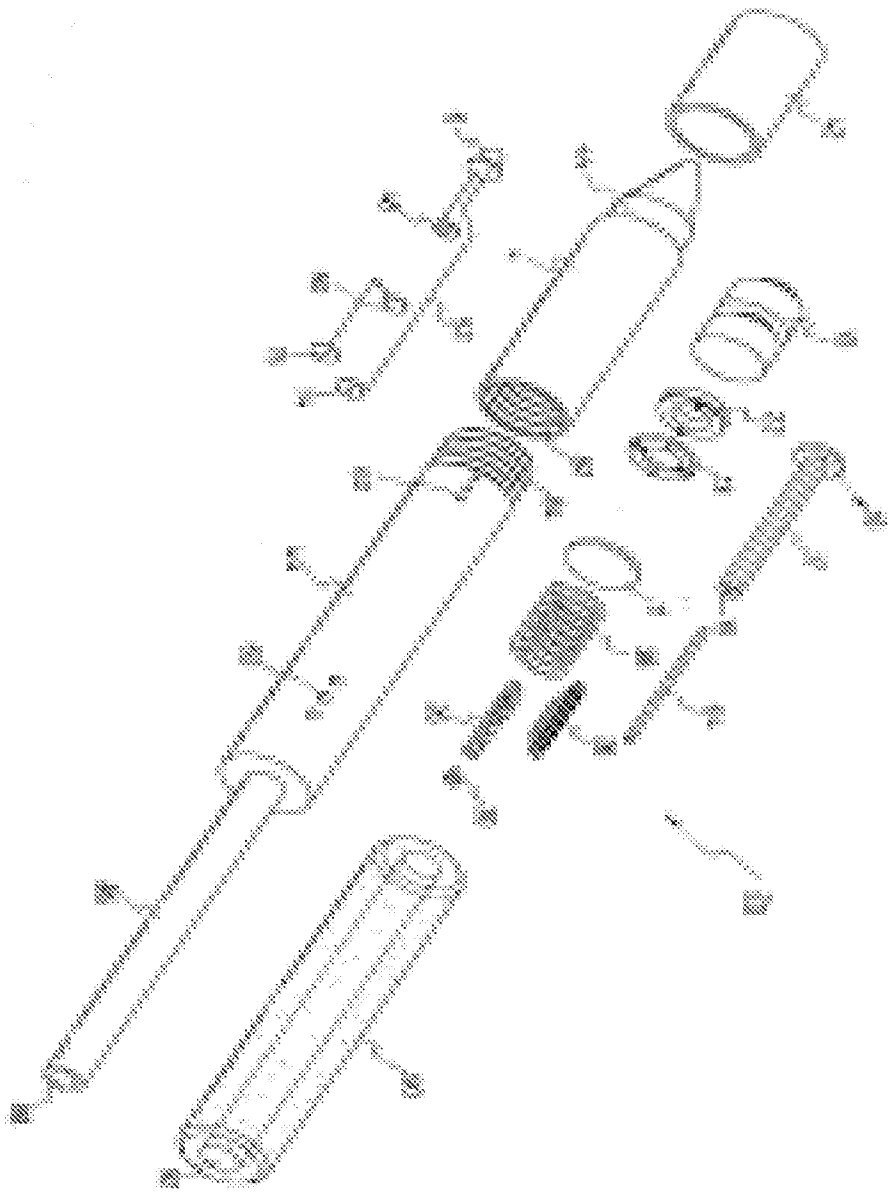


Figure 6



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Figure 7



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Figure 8

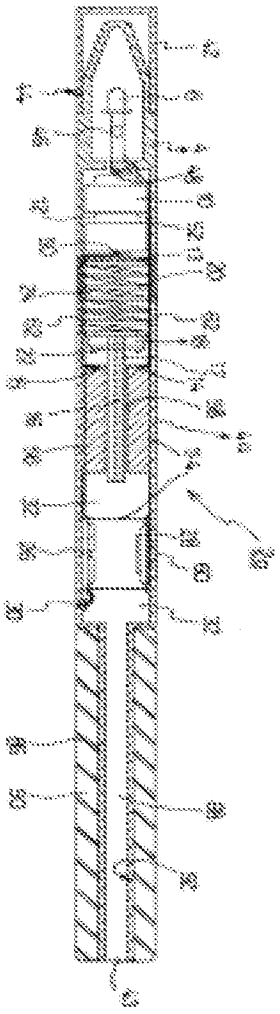
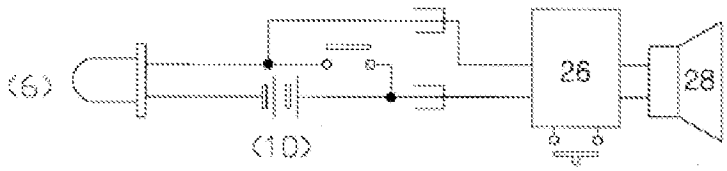


Figure 9



I hereby certify that this copy is true and correct to the original.

February 19, 2018

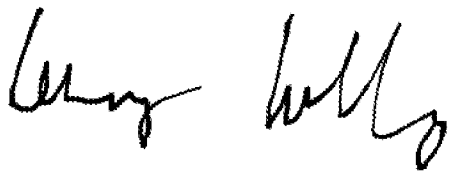
Head of the Korea Intellectual Property Office

[Seal:] *Head of the Korea Intellectual Property Office*

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Corey Colling

February 22, 2018

Date

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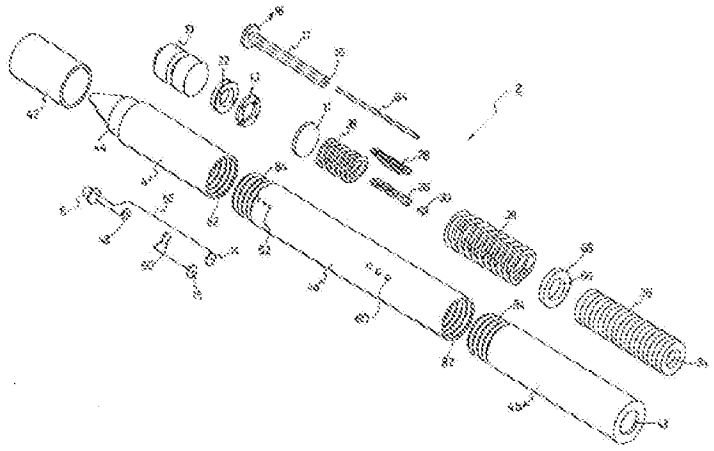
심사청구 : 있음

(54) 전자시가

요약

본 발명은 공기를 빨아들일 때 마다 전자시가로부터 발광(發光) 및 발향되게 함으로서 마치 담배를 피우는 느낌을 제공하여 금연(禁煙)에 도움을 주고, 더불어 심리적인 안정감과 치료효과가 있는 음향과 먹음으로서 건강을 증진시키거나 보조할 수 있는 건강보조식을 무가적으로 제공하여 궁극적으로는 습관성 흡연자의 건강을 도모하고 나아가 니코틴 중독자들을 포함한 모든 흡연자들의 금연에 큰 도움을 줄 수 있도록 한 전자시가(electornic cigar)에 관한 것이다.

대표도



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색인어
전자시거, 발광다이오드, 진견지, 피스톤 스위치, 음향발생장치, 건강보조식

명세서

도면의 간단한 설명

도 1 : 본 발명의 전체 외관 사시도.

도 2 : 본 발명의 분해사시도.

도 3 : 본 발명에서 피스톤 스위치가 동작하기 전의 단면도.

도 4 : 본 발명에서 피스톤 스위치가 동작한 후의 단면도.

도 5 : 본 발명 다른 실시예의 단면도.

도 6 : 본 발명 몸체 연결부의 일 실시 예 단면도.

도 7 : 본 발명 또 다른 실시 예의 단면도.

도 8 : 본 발명 또 다른 실시 예의 분해 사시도.

도 9 : 본 발명 일 실시 예의 회로도.

< 도면의 주요 부분에 대한 부호의 설명>

(2)--전자시거(4)(4a)(4b)---몸체

(6)--발광다이오드(8)--램프실

(10)--견전지(12)--전지실

(14)(15)--이동접점(16)(34)(88)--통기공

(18)--피스톤 스위치(20)(38)--스프링

(22)--고정접점(24)--피스톤실

(26)--음향발생장치(28)--스피커

(30)--스위치(32)--수납실

(36)(90)--건강보조식(기호품)(40)--수납실

(42)--캡(43)--출구

(44)--단턱부(46)--지지봉

(48)--양극단자(50)--음극단자

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(52)(54)(56)--도선(58)--운동실

(60)--통공(62)--급기공

(64)--방향체(66)--통공

(68)--격리판(70)(72)--결합부

(74)(76)--돌출대(78)(80)--요입홈

(82)(84)--나사산(86)--관체부

(92)--결합공

발명의 상세한 설명

발명의 목적

발명이 속하는 기술 및 그 분야의 종래기술

본 발명은 담배와 같거나 비슷한 향상 모양의 전자시거(electornic cigar)에 관한 것으로, 상세하게는 공기를 빨아들일 때 마다 전자시거로부터 발광(發光) 및 발향되게 함으로서 마치 담배를 피우는 느낌을 제공하여 금연(禁煙)에 도움을 주고, 더불어 심리적인 안정감과 치료효과가 있는 음향과 먹음으로서 건강을 증진시키거나 보조할 수 있는 건강보조식을 부가 제공하여 궁극적으로는 습관성 흡연자의 건강을 도모하고 나아가 니코틴 중독자들을 포함한 모든 흡연자들의 금연에 큰 도움을 줄 수 있도록 한 것이다.

일반적으로 담배는 기호품이기는 하나 인체에 치명적인 질병을 초래함은 익히 잘 알려져 있다. 그러나, 애연가들의 경우 사회생활의 다양성과 대인관계 때문에 습관적으로 피워오던 기호성 담배를 끊는 다는 것이 매우 힘든 과제중의 하나이다. 특히 담배는 각종 발암 유발물질인 니코틴, 타르 등 인체에 유해한 성분들이 많이 포함되어 있어 폐암이나 순환기 질환(후두암 및 혈관 수축에 의한 버거씨 병 등)과 같은 각종 질병 및 사망의 원인이 될 뿐 아니라 특히 주변 사람들에게는 간접흡연에 의한 피해를 주고 있다.

따라서, 금연운동이 사회적으로 널리 전개되고 있으나 이미 흡연을 하고 있는 애연가들은 그 중독성과 습관성 때문에 쉽사리 끊지 못하고 있어서 실효를 거두지 못하고 있는 실정이다.

따라서, 최근에는 상기 애연 파이프등 이외에 담배를 즐길 수 있도록 도와주는 금연담배 및 금연 보조파이프 등과 같은 보조기구가 많이 개발되어 상품화되고 있다.

즉, 금연담배의 경우 담배를 피울 때 대부분 담배맛이 쓰게하거나 담배 특유의 향취가 상실되게 함으로써 애연가들의 흡연 의욕을 점차적으로 상실시켜 담배를 서서히 끊도록 하고 있다.

그리고, 금연 보조파이프는 담배연기와 잘 반응하는 여러 물질들이 함유된 필터가 설치되어 있어서 흡연할 때 니코틴과 타르를 여과시키도록 한 것으로, 흡연에 따른 담배의 유해성분을 어느 정도 여과시키기에는 충분하나 상기한 여과기능과 함께 담배에 대한 즉각적인 거부반응을 일으켜 금연효과를 제공하는 데에는 부족한 편이다. 또한 사용시간이 경과될수록 필터교체에 의한 비용증가와 교체에 따른 불편함이 지적되고 있다.

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사회적으로 금연열풍이 확산되고 있는 근자에는 금연초와 같은 금연건강보조식에 이어 흡연 피해를 줄여주는 기능성 식품 시장이 크게 성장하고 있다. 이를테면 니코틴이 인체내에서 발암물질화하는 것을 억제시키고 중독성과 금단현상을 완화시켜 금연을 도와주는 기능성 껌, 기능성 캔디, 기능성 음료등의 상품들이 잇달아 선보이고 있다.

그리고, 제과업계에서도 충치예방 효과를 강조한 종의 틈을 이용 " 효과상품" 으로 니코틴 해독점을 정치고 있으며, 피부를 통한 니코틴 흡수량을 단계적으로 줄여가는 방식으로 금연을 도와주는 패치제도 높은 시장점유율을 보이고 있는 실정이다.

발명이 이루고자 하는 기술적 과제

따라서, 본 발명은 금연에 집착한 수 많은 금연건강보조식 회사들의 연구개발투자의 틈에서 탈피하여 인간 흡연 심리에 바탕한 보다 창의적인 사고로 뉴 밀레니엄 시대에 걸맞는 고기능성 담배 대용품인 전자시거(electornic cigar)를 제공함으로써 습관성 흡연자들이 담배의 피해로부터 벗어나도록 하고, 나아가 흡연 중독자들도 본 발명 전자시거를 이용하여 서서히 담배의 해악으로부터 벗어날 수 있어서 유해성 담배의 점축하단 효과는 물론 국민건강과 인류건강에 도움을 주고자 안출하게 된 것이다.

상기 목적을 달성하기 위하여 공기(空氣)를 빨아들일 때 마다 전자시거로부터 발광(發光) 및 발향되게 함으로서 마치 담배를 피우는 느낌을 제공하여 금연(禁煙)에 도움을 주고, 더불어 심리적인 안정감과 치료효과가 있는 음향과 먹음으로서 건강을 증진시키거나 보조할 수 있는 건강보조식을 부가적으로 제공하여 궁극적으로는 습관성 흡연자의 건강을 도모하고 나아가 니코틴 중독자들을 포함한 모든 흡연자들의 금연에 큰 도움을 줄 수 있도록 한다.

그리고, 본 발명은 기존 담배 대용제, 금연 건강보조식 등의 개발 추진 방향과는 달리 보다 과학적이고 실질적으로 흡연층에 접근하여 " 청소년용" , " 여성용" , " 남성용" , " 금연용" 등으로 구분하여 전문성을 가지고 심리적으로 접근하여 새로운 기호품이 되도록 기존의 담배로는 실행이 불가능한 새련된 디자인과 전자음향 발생기능을 부여하고, 또한 흡연 중독성 문제는 본인의 의지와 담배 이미테이션과 건강보조식으로 접근하였으며, 흡연 습관성 문제는 담배 이미테이션과 전자시거와의 친밀감으로 흡연의 폐해를 줄이도록 한 것이다.

발명의 구성 및 작용

이하 본 발명의 바람직한 실시 예를 첨부한 도면에 따라 상세히 설명하면 다음과 같다.

도 1은 본 발명 전자시거(2)의 전체 외관 사시도이고, 도 2는 그 분해 사시도이고, 도 3은 그 단면도이다.

본 발명 전자시거(2)는 통상의 담배와 같거나 비슷한 크기의 원통 형상이며, 물론 권련(궐련)처럼 더욱 크게 제조할 수도 있다.

전자시거(2)의 외형을 구성하는 몸체(4)(4a)(4b)는 합성수지 또는 금속으로 구성되며, 몸체(4)(4a)(4b)의 길이방향으로 억지 끼움방식 또는 나사 체결방식으로 분리 결합할 수 있게 여러 개의 조각으로 구성된다.

그리고, 선단과 중앙에 위치하는 몸체(4)(4a)는 경질로 하고, 필터에 해당하면서 사용자의 입과 접촉하는 후부 몸체(4b)는 연질로 구성하여 사용할 때 딱딱함이나 거부감이 없도록 함이 바람직하다.

그러나, 보다 고급스런 심미감을 디자인을 얻기 위하여 필터에 해당하는 후부 몸체(4b)는 인체에 전혀 무해하면서 친밀감이 있고 고급스러운 금으로 제조하거나 또는 그 외면을 금으로 코팅(또는 도금)하고, 또한 선단 및 중간 부분 몸체(4)(4a)는 은으로 제조하거나 그 외면을 은으로 코팅(또는 도금)하여 기존의 담배로는 표현이 불가능한 새련된 디자인을 갖게 할 수 있으며, 이러한 경우 후부 몸체(4b) 부분은 경질이 될 것이다.

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그리고, 상기 몸체(4)(4a)(4b)는 원적외선을 방출하면서 인체와 주변에 유익함을 제공하는 세라믹, 맥반석, 옥, 토르말린 등으로 제조 및 성형할 수도 있다.

한편, 몸체(4)(4a)(4b)의 선단 내부에는 램프실(8)이 형성되고, 상기 램프실(8)에는 담배불을 대신하게되는 발광다이오드(6)가 설치된다. 상기 램프실(8)의 후단에는 한 개 이상의 소형 건전지(10) 및 건전지(10) 접촉단자와 격리판(11)이 각각 설치되는 전지실(12)과, 피스톤 스위치(18)와 스프링(20) 및 고정접점(22)이 각각 설치되는 피스톤실(24)과, 음향발생장치(26)와 스피커(28) 및 스위치(30)가 각각 설치되는 수납실(32)과, 통기공(34)을 갖는 건강보조식(기호식)(36)과 상기 건강보조식(36)를 탄지하는 스프링(38)이 각각 설치되는 수납실(40)이 위치하며, 전자시거(2)의 선단부에 결합되는 투명 또는 반투명 캡(42)과, 통기공 및 통기공으로부터 흡기되는 공기가 유통되는 복수의 기로(氣路)와 출구(43)로 구성된다.

그리고, 피스톤 스위치(18)는 절연체(13)에 고정되는 이동접점(14)(15)과, 통기공(16)과, 확개부, 몸체부(17) 및 통기공(16)으로 구성되며, 스프링(38)의 선단은 결합홈에 끼워져 고정된다.

몸체(4)의 선단부에는 발광 다이오드(6)의 점등광이 바깥으로 투광될 수 있게 투명 또는 반투명 재질로 형성되며, 캡(42)이 쉽게 분리, 결합될 수 있게 단턱부(44)가 형성되고, 선단으로 향 할수록 그 외경이 점차적으로 작아진다.

담배불빛을 대신하는 발광다이오드(6)는 황색 발광다이오드나 적색 발광다이오드를 사용하여 담배 불빛에 최대한 가까운 황색이 표출되도록 한다.

상기에서 담배불빛에 근접하는 황색 발광다이오드의 경우, 캡(42)과 캡(42)이 결합되는 몸체(4) 부분을 제조 성형할 때 투명 및 투명에 가까운 색으로 착색하거나 안료를 혼합하여 담배개와 같은 색을 표현하도록 한다.

그리고, 적색 발광다이오드를 사용하는 경우 캡(42)과 캡(42)이 결합되는 몸체(4) 부분을 제조 성형할 때 황색이나 황색에 가까운 색으로 착색하거나 또는 안료를 혼합하거나 또는 필터를 설치하여 담배 불빛에 최대한 근접하는 빛으로 발광(점등)되게 한다.

그리고, 한 쌍으로 구성되는 발광다이오드(6)의 리드선 사이에는 몸체(4)에 고정되는 지지봉(46)을 형성하여 발광다이오드(6)가 지지되면서 그 위치가 이탈되지 않도록 한다.

전지실(12)에는 건전지(10)의 양극에 탄성 접촉되는 양극단자(48)와 건전지(10)의 음극이 탄성 접촉되는 음극단자(50)가 위치하며, 양극단자(48)는 발광다이오드(6)의 일측 리드선과 연결되고, 음극단자(50)와 발광다이오드(6)의 타측 리드선은 도선(52)을 통하여 이동접점(14)(15)에 각각 연결된다.

즉, 고정접점(22)은 하나로 구성되는 일체형이며, 이동접점(14)(15)은 양분되어 절연이 유기되며, 이들 고정접점(22)과 이동접점(14)(15)의 상호 흡ㅊ혹에 의해 온(ON)되고 서로 이격에 의해 오프(OFF)되는 하나의 스위치이다.

따라서, 사용자가 전자시거(2)의 출구(43) 부분을 입에 물고 공기를 빨아들이면, 그 흡입력에 의해 피스톤 스위치(18)가 도 3과 같이 후진 이동하면서 고정접점(22)이 이동접점(14)(15)에 접촉되면 음극단자(50)와 발광다이오드(6)의 타측 리드선이 전기적으로 연결되어 통전(通電)되고 발광다이오드(6)는 발광(發光)된다.

또한 상기 양극단자(48)와 음극단자(50)는 도선(54)(56)을 통하여 음향발생장치(26)의 전원단자에 각각 연결되어 전원이 공급되며, 상기 음향발생장치(26)에는 스피커(28)와 스위치(30)가 각각 접속된다.

상기에서 몸체(4)(4a)(4b)는 억지끼움 또는 나사 결합방식에 의해 분리,결합되면서 전원공급선이 단절(단선)될 수 있으나 도 9와 같이 상기 전원공급선이 정상적으로 연결될 수 있도록 한다. 이러한 구조는 일반적이고 많이 적용되고 있는 기술이므로 자세한 설명은 생략하도록 한다.

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그리고, 사안에 따라서는 발광다이오드(6)를 점등하기 위한 건전지와 음향발생장치(26)를 구동하기 위한 건전지를 몸체(4)(4a) 내에 따로 내장시켜 사용할 수도 있으며, 이러한 경우 도 5와 같이 전지실(12)과 수납실(32)을 이격 설치할 수 있을 것이다.

물론, 건전지(10)를 공용하는 경우 전지실(12)과 수납실(32)이 연결되거나 또는 이웃에 위치하도록 설치하면 될 것이다.

그리고, 건전지(10)가 거의 방전된 경우 몸체(4)(4a)의 선단과 중앙부를 분리한 다음 방전된 건전지를 제거하고, 새로운 건전지를 전지실(12)에 장착시킨 다음 분리하였던 몸체(4)(4a)의 후단과 중앙부를 결합하면 된다.

상기 음향발생장치(26)는 각종 노래 또는 음악 또는 소리(음성 및 자연의 소리를 포함한다.) 등의 음향 데이터를 디지털 신호로 저장하는 메모리부와, 스위치(30) 조작에 의해 제어부로 부터 요청된(선택된) 디지털 음향(오디오)신호를 아날로그 신호로 출력하는 D/A 콘버터와, 상기 D/A콘버터로부터 출력되는 신호를 큰 세력의 신호로 증폭시켜 스피커(28)로 출력되게 하는 증폭부 및 이들을 총괄 제어하는 제어부로 구성되며, 이러한 음향발생장치(26)는 여러 산업분야에서 적용되고 있으므로 그 자세한 설명을 생략하도록 한다.

그리고, 스피커(28)가 고정되는 수납실(32)에는 몸체(4a) 외부와 연결되는 복수 개의 통공(60)을 형성하여 스피커(28)로부터 발생되는 음향이 전자시거(2)의 바깥으로 고스란히 전달(출력)되도록 한다.

상기 스위치(30)의 노브는 사용자가 쉽게 조작할 수 있도록 몸체(4a) 바깥으로 약간 돌출되는 정도이며, 스위치(30)를 누름에 따라 음향발생장치(28)가 동작하면서 상기의 과정으로 음향이 출력된다.

본 발명에서 전자시거(2)를 사용할 때 사용자가 공기를 빨아들이지 않을 경우 담배를 피움에 거의 미약하게나마 발광다이오드(6)가 점등되어 있고, 공기를 빨아 들일때에는 그 흡입력에 비례하여 발광다이오드(6)의 광도가 변화되게 하여 실제 담배처럼 묘사되도록 함으로써 사용자에게 한층 친밀감이 부여되도록 한다.

상기 음향발생장치(28)는 스위치(30)의 트리거에 의해 동작되는 기간동안만 정상 동작하고 나머지 기간은 전원이 차단되거나 미소한 전류의 대기전원만 공급되게 함으로써 건전지의 불필요한 방전을 방지하도록 함이 바람직하다.

상기 음향에는 명상음악, 멜로디, 경쾌한 행진곡, 유행가, 또는 소비자의 다양한 욕구에 부응하는 음향이나 소리가 포함된다.

예컨대, 아침에 전자시거(2)를 사용하는 경우 스위치(30)를 한 번 눌러주면 경쾌한 멜로디 또는 행진곡 등이 스피커(28)로 출력되게 하고, 점심시간이나 활동시간의 경우 스위치(30)를 두번 누름에 따라 유행가 등이 스피커(28)로 출력되게 하고, 저녁시간의 감자리에 드는 시간인 경우 스위치(30)를 세번 누름에 따라 명상음악이나 명상의 소리 등이 스피커(28)로 출력되게 함으로서 심리적인 안정과 치료효과를 얻을 수 있다.

즉, 특정 음악이나 암시, 낭송에 의해 심리적인 안정과 심리적인 치료효과를 얻을 수 있게된다.

그리고, 음향발생장치(26)에는 플립플롭 기능 또는 트리거회로를 부가하여 스위치(30)를 계속하여 누를 필요없이 1초 ~ 2초 정도로 짧게 누르더라도 해당 음향이나 노래 또는 음악 또는 소리가 완전히 끝날 때까지 출력되도록 한다.

그리고, 스위치(30)를 3초 ~ 4초간 길게 누르는 경우 음향발생장치(26)가 정지되도록 구성하여 필요에 의해 음향발생장치(26)의 동작상태를 중지시킬 수 있으며, 5초 ~ 6초 정도로 길게 누르는 경우 음향 기능을 설정하거나 출력 음향이나 노래 또는 음악 또는 소리를 선택하거나 순서를 변경할 수 있을 것이다.

그리고, 이러한 것은 한 예를 든 것이며, 물론 사용자의 요구에 부응하여 다양하게 음향이나 노래 또는 음악 또는 소리의 변화 및 기능 설정을 할 수 있을 것이다.

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한편, 피스톤실(24)에는 몸체(4a)의 외부와 연결되는 복수 개의 급기공(62)을 형성하고, 피스톤 스위치(18)의 길이 방향 중앙에는 앞 뒤로 개방되는 통기공(16)을 형성하고, 피스톤 스위치(18)의 외주면은 운동실(58)의 내주면에 닿을 듯 말듯한 이격거리를 유지시켜 피스톤 스위치(18)가 큰 저항감 없이 전,후진 운동할 수 있도록 한다.

상기 통기공(16)의 단면적은 급기공(62)의 전체 단면적보다 훨씬 작게 형성하여 출구(43)를 통한 흡입력이 작용되면 전진하여 있던 피스톤 스위치(18)가 스프링(20)의 탄성력을 초월하면서 후진할 수 있도록 구성한다.

따라서, 평소에는 도 3과 같이 스프링(20)의 탄성력에 의해 피스톤 스위치(18)가 피스톤실(24)의 선단으로 전진하여 있다가 사용자가 전자시거(2)의 출구(43) 부분을 입에 물고 피스톤 스위치(18)를 당기고 있는 스프링(20)의 탄성력보다 강하게 공기를 흡입하게 되면, 도 4와 같이 피스톤 스위치(18)가 후진하여 고정접점(22)과 이동접점(14)(15)이 전기적으로 접촉하게 되고, 앞서 기술한 정저항 발광다이오드(6)로 건전지(10)의 전원이 인가되면서 발광(點灯)된다.

그리고, 상기 급기공(62) 내에는 건강과 금연에 도움을 주는 허브향, 아로마향, 계피, 박하, 담배향 등등 및 다른 향이나 향선료를 단독 또는 혼합하여 액상 또는 분말 상태로 함유된 봉상의 스펀지 또는 솜으로 된 방향체(64)을 넣어 흡입시 이들 향이 방산되도록 한다.

상기 방향체(64)는 교환이 쉽도록 급기공(62)에 집어 넣거나 끄집어 낼 수 있도록 하고, 사용자의 필요에 의해 사용을 생략할 수 있으며, 향은 사용자의 요구에 부응하는 방향제(방향제)로 다양화할 수 있다.

한편, 수납실(38)의 후단에 복수 개로 설치되는 건강보조식(기호식)(36)은 중앙에 공기가 유통될 수 있게 통기공(34)이 형성된 도너츠 형상으로 타액에 의료적 잘 녹는 기호식이며, 비교적 큰 내경의 출구(43)에 접해 있으므로 사용자의 타액 및 혀의 접촉에 의해 녹으면서 입안으로 유입되어 섭음할 수 있게 된다.

상기 건강보조식(34)은 인체에 유익한 약리효과나 건강건강보조식품, 이를테면 칼슘, 비타민, 다이어트 식품, 특정 질환에 약리효과가 있는 약제(생약제 및 한약제), 기타 건강식품 등의 분말 및 감미료와 기타 첨가물을 적당한 비율로 혼합한 다음 타액에 의해 쉽게 녹을 수 있는 교형체로 성형하면 될 것이다.

한편, 금단현상의 원인은 니코틴이 신경전도물질을 대신하고 최종적으로 뇌에서 도파민 함량을 증가시켜 쾌감중추를 흥분시키기 때문이며, 상기 니코틴이 일정 이하로 감소되면 쾌감중추가 저하되어 심한 불쾌감을 느끼게 된다.

또한, 기분을 상쾌하게 하고, 혈액순환을 촉진하며, 호흡기 등에 효능이 있는 카페인은 니코틴과 마찬가지로 습관성을 가지기는 하지만 뇌에서 도파민 함량을 증가시켜 쾌감중추를 흥분시키는 작용이 있으므로 적당량의 감미료와 혼합한 다음 고형화시켜 본 발명의 건강보조식(36)로 사용할 수 있으며, 이러한 경우 뇌나 신경계의 흥분수준을 유지할 수 있게된다.

그리고, 석음에 의해 건강보조식(36)가 녹더라도 스프링(38)의 탄발력에 의해 건강보조식(36)가 출구(43) 방향으로 일정거리 이므로 혀와 근접하게 된다.

상기 건강보조식(기호품)(36)는 전량 또는 거의 소모된 경우 후단과 중앙부의 몸체(4a)(4b)를 분리한 다음 수납실(40)에 새로운 건강보조식(기호품)(36)를 채워 넣은 후 상기 몸체(4a)(4b)를 결합하여 사용하면 된다.

상기 스프링(38)과 건강보조식(36) 사이에는 통공(66)이 형성되고 위생적이며 경질 상태의 격리판(68)이 끼워진다.

도 5는 음향발생장치(26)와 스피커(28) 및 스위치(30) 등이 설치되는 수납실(32)을 건전기(10) 부근 또는 센서실(12) 부근으로 이동 설치하여 전원공급을 위한 도선을 줄이고, 상기 도선의 연결에 이상이 없도록 한 것이다.

그리고, 도 3에서 처럼 피스톤실(24)의 스프링(20)을 단턱부(66)가 형성된 운동실(58)로 이동 설치하여 피스톤 스위치(18)가 탄발지지되게 할 수 있다.

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또한 도 6은 억지끼움 방식으로 몸체(4)(4a)(4b)의 연결부를 분리.결합할 수 있게 도시한 도면으로, 몸체(4)(4a)(4b)의 단부에 같은 크기의 외경과 내경을 갖는 결합부(70)(72)를 각각 형성하고, 그 결합부(70)(72)의 단부에 돌출대(74)(76)를 각각 형성하고, 돌출대(74)(76)가 결합 및 접촉되는 부분에는 요입홈(78)(80)을 방돌러 형성함으로써 억지끼움 방식으로 몸체(4)(4a)(4b)의 분리와 결합을 쉽게 달성할 수 있게된다.

상기 결합부(70)(72)는 테퍼 암수 결합구조이며, 몸체(4)(4a)(4b)를 나사결합방식으로 체결하는 경우 도 2와 같이 몸체(4)(4a)(4b)의 단부에 암.수 체결구조의 나사산(82)(84)을 각각 형성하면 될 것이다.

도 7, 8은 본 발명 다른 실시 예로 도시한 전자시거(2a)의 분해사시도 및 그 단면도이다.

상기 전자시거(2a)는 대부분이 앞서 기술한 전자시거(2)와 별반 차이가 없는 대동소이한 구성이며, 다만 몸체(4a)의 후단에 관체부(86)를 연장 형성하고, 관체부(86)의 길이방향 내부에 통기공(88)을 형성하고, 관체부(86)의 외면에 건강보조식(90)를 분리할 수 있게 끼워 구성한 것이다.

상기 건강보조식(90)에는 관체부(86)에 결합될 수 있게 길이방향으로 결합공(92)이 형성되며, 도 7, 8에서 처럼 일체로 형성하거나 도 2 내지 도 5에서 처럼 도너츠 형상인 건강보조식(36)의 통기공(34) 부분을 관체부(86)의 외주면에 끼워 사용할 수 있을 것이다.

상기 건강보조식(90)은 앞서 기술한 건강보조식(36)과 같은 것으로 구성하여 사용자가 타액으로 또는 혀로 녹여 섭음하도록 하거나, 또는 튜브형의 소시지, 겔(젤) 상태로 하여 저작하면서 먹을 수 있으며, 건강보조식(90)이 전량 또는 거의 소모되면 새로운 건강보조식을 끼워 사용하면 될 것이다. 그리고, 상기 건강보조식(90)은 외부로 노출되어 있으므로 섭음하기에 편하다.

본 발명의 원통형 몸체(4)(4a)(4b)는 그 길이나 직경 등이 담배와 동일하거나 비슷하여 외관상 거의 담배로 보여진다.

그리고, 사용할 때에도 담배를 피우는 방법과 동일하게 출구(43) 부분을 입에 물고 공기를 흡입하게 되면 몸체(4a)에 형성된 급기공(62)을 통하여 몸체(4a) 바깥의 공기가 유입되어 인체 내부로 흡입된다.

공기의 유통과정을 살펴보면, 몸체(4a)의 급기공(62)을 통하여 흡입되는 공기는 피스톤실(24) → 통기공(16) → 수납실(32) → 수납실(40) → 통기공(34) → 출구(43)를 통하여 사용자의 입안으로 흡입되며, 이 과정에서 피스톤 스위치(18)가 후퇴하면서 떨어져 있던 이동접점(22)이 고정접점(14)(15)에 접촉되고 통전회로가 구성되므로 전원지(10)의 전원이 발광다이오드(6)로 공급되고, 발광다이오드(6)는 점등 및 발광된다.

그리고, 흡입력에 따라 고정접점(22)과 이동접점(14)(15)의 접촉압력과 접촉저항이 달라지게 되므로 발광다이오드(6)의 광도(光度)가 달라지게 된다.

즉, 출구(43)를 통한 사용자의 흡입력이 강해지면 강해질수록 고정접점(22)과 이동접점(14)(15)의 접촉저항이 감소되므로 발광다이오드(6)의 광도(光度)가 증가되며(밝아지며), 사용자의 흡입력이 약해지면 고정접점(22)과 이동접점(14)(15)의 접촉저항이 증가되므로 발광다이오드(6)의 광도가 감소되고 어두워진다.

따라서, 실제로 담배를 피우는 것과 같은 발광효과를 갖게된다.

상기 고정접점(22)과 이동접점(14)(15)의 저항은 접촉압력에 따라 변동이 다소 심한 저항체를 접촉표면에 피복시켜 구성할 수 있을 것이다.

한편, 발광다이오드(6)의 발광빛은 몸체(4)의 선단과 캡(42)을 통하여 외부로 투출되면서 실제로 담배를 피우는 것과 같은 분위기가 연출될 뿐 아니라, 연기를 뿜는 무의식적인 욕구가 자연스럽게 제공되기 때문에 이러한 불안이 해소된다.

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그리고, 본 발명 전자시거는 기존 담배 대용제, 금연 건강보조식 등의 개발 추진 방향과는 달리 보다 과학적이고 전문적인면서 심리적으로 흡연층에 접근하고 " 청소년용" , " 여성용" , " 남성용" , " 금연용" 등으로 구분하여 새로운 기호품이 되도록 하고, 또한 필터에 해당하는 후부 몸체(4b)는 인체에 전혀 무해하면서 친밀감이 있고 고급스러운 금으로 제조하거나 또는 그 외면을 금으로 코팅(또는 도금)하고, 또한 선단 및 중간 부분 몸체(4)(4a)는 은으로 제조하거나 그 외면을 은으로 코팅(또는 도금)하여 기존의 담배로는 표현이 불가능한 세련된 디자인을 갖도록 한다.

또한, 전자음향 발생기능을 부여하여 심리적인 안정감과 심리적인 치료효과를 얻을 수 있으며, 흡연 중독성 문제는 본인의 의지와 담배 이미테이션과 건강보조식으로 접근하여 해결하고, 흡연 습관성 문제는 담배 이미테이션과 전자시거와의 친밀감으로 흡연의 피해를 줄일 수 있게 된다.

이상과 같이 본 발명은 특정의 바람직한 실시예를 들어 도시하고 설명하였으나, 본 발명은 상기한 실시예에 한정되지 아니하며 본 발명의 정신을 벗어나지 않는 범위 내에서 당해 발명이 속하는 기술분야에서 통상의 지식을 가진 자에 의해 본 발명의 기술사상과 아래에 기재될 특허청구범위의 균등범위 내에서 다양한 수정 및 변형이 가능함은 물론이다.

발명의 효과

이상과 같이 본 발명은 담배 대용으로서 인체에 유익한 전자시거를 제공함으로써 특히 습관성 흡연자의 금연에 크게 기여할 수 있으며, 나아가 니코틴 중독자들에 있어서도 본 발명을 권장하여 서서히 치유할 수 있는 효과가 있다.

본 발명은 외관상 담배를 피우는 것과 동일할 뿐 아니라 담배를 피우는 느낌을 갖게되고 이로 인하여 담배가 갖는 해악에서 벗어남은 물론 오히려 건강보조식에 의해 건강을 증진하고 인체에 유익한 약재를 자연스럽게 공급하는 효과를 갖는다.

또한 본 발명은 특정 음악이나 임시, 낭송에 의해 심리적인 안정과 심리적인 치료효과를 얻을 수 있는 효과가 있다.

또한 본 발명은 분리형이므로 소모성인 건전지와 발향체 및 건강보조식을 쉽게 교환할 수 있는 효과가 있다.

그리고, 본 발명은 무엇보다 주변사람의 건강을 해치지 않게되며, 흡입에 의해 발광다이오드의 발광빛이 몸체 투울되면서 실제로 담배를 피우는 것과 같은 분위기가 연출될 뿐 아니라, 연기를 뿜다는 무의식적인 욕구가 자연스럽게 제공되기 때문에 어려한 불안이 해소되는 등의 효과가 있다.

그리고, 본 발명은 인간심리에 접근한 아이디어 상품으로서 기존의 담배 대용제와는 성격이 다르며, 저렴한 투자로 생산이 가능하며 매우 경제성이 높은 효과가 있다.

또한, 세련된 디자인으로 계층별 세대별로 호기심과 인기를 끌 수 있으며, 비흡연자에게는 담배로부터의 1차적 접근을 차단하는 새로운 상품으로 자리 잡을 수 있을 뿐 아니라, 흡연자에게는 2차적 접근을 차단하여 심리적 치료로 금연에 이룰수 있는 건강보조식(기호품)를 병행하여 보다 손쉽게 금연할 수 있으며, 건강건강보조식품을 자연스럽게 식음토록 하여 일거양득의 효과를 가져올 수 있는 유용한 상품이다.

(57) 청구의 범위

청구항 1.

몸체 내부에 발광다이오드(6)가 설치되는 램프실(8)과, 한 개 이상의 소형 건전지(10)와 건전거(10) 접촉단자가 설치되는 전지실(12)과, 이동접점(14)(15)과 통기공(16)이 형성된 피스톤 스위치(18)와 스프링(20) 및 고정접점(22)이 설치되는 피스톤실(24)과, 음향발생장치(26)와 스피커(28) 및 스위치(30)가 설치되는 수납실(32)과, 통기공(34)을 갖는 건강보조식(36)과 상기 건강보조식(36)을 탄지하는 스프링(38)이 설치되는 수납실(40)과, 전자시거(2)의 선단부에 결합되는 캡(42)과, 통기공 및 통기공으로부터 흡기되는 공기가 유통되는 복수의 통기공과 출구(43)로 구성

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하여서 된 전자시거.

청구항 2.

청구항 1에 있어서 : 몸체는 길이방향으로 분리 결합할 수 있는 결합구조로 복수 개의 몸체(4)(4a)(4b) 임을 특징으로 하는 전자시거.

청구항 3.

청구항 2에 있어서 : 후부 몸체(4b)는 연질로 구성함을 특징으로 하는 전자시거.

청구항 4.

청구항 1 또는 청구항 2에 있어서 : 건전지(10)에 접촉하는 양극과 음극단자는 도선(54)(56)을 통하여 음향발생장치(26)의 입력단자에 각각 연결하고, 음향발생장치(26)에는 스피커(28)와 스위치(30)를 각각 접속하여서 된 전자시거.

청구항 5.

청구항 5에 있어서 : 음향발생장치(26)는 노래 또는 음악 또는 소리 등의 음향 데이터를 디지털 신호로 저장하는 메모리부와, 스위치(30) 조작에 의해 제어부로 부터 요청된 디지털 음향신호를 아날로그 신호로 출력하는 D/A 콘버터와, 상기 D/A 콘버터로부터 출력되는 신호를 큰세력의 신호로 증폭하여 스피커(28)로 출력하는 증폭부 및 제어부로 구성하여서 된 전자시거.

청구항 6.

청구항 2에 있어서 : 피스톤실(24)에 몸체(4a)의 외부와 연결되는 복수 개의 급기공(62)을 형성하고, 피스톤 스위치(18)의 길이방향 중앙에 앞뒤로 개방되는 통기공(16)을 형성하고, 피스톤 스위치(18)의 외주면은 운동실(58)의 내주면에 닿을 듯 말듯한 이격거리를 유지시켜 큰 저항없이 전,후진 운동할 수 있도록 하여서 된 전자시거.

청구항 7.

청구항 6에 있어서 : 급기공(62) 내에 방향체(64)를 설치하여서 된 전자시거.

청구항 8.

청구항 2에 있어서 : 몸체의 단부에 같은 크기의 외경과 내경을 갖는 결합부(70)(72)를 각각 형성하고, 그 결합부(70)(72) 단부에 돌출태(74)(76)를 각각 형성하고, 돌출태(74)(76)가 결합 및 결합되는 부분에는 요입홈(78)(80)을 빙둘러 형성하여서 된 전자시거.

청구항 9.

청구항 2에 있어서 : 몸체(4a)의 후단에 관체부(86)를 연장 형성하고, 관체부(86)의 길이방향 내부에 통기공(88)을 형성하고, 관체부(86)의 외면에 건강보조식(90)을 분리 결합할 수 있게 설치하여서 된 전자시거.

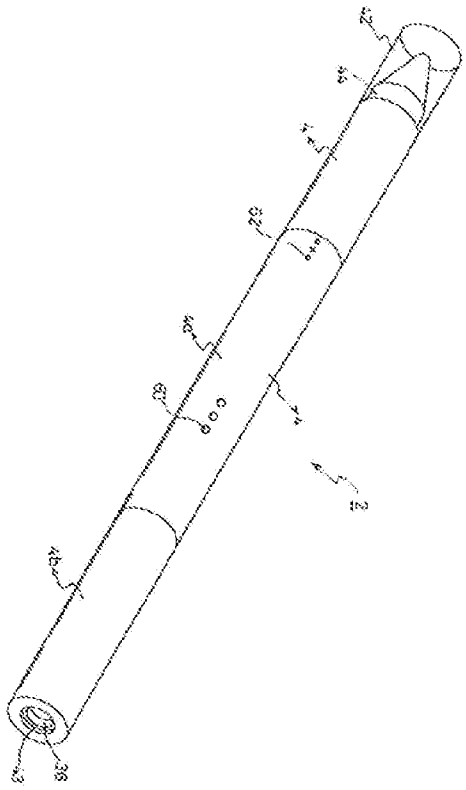
청구항 10.

청구항 1 또는 청구항 2에 있어서 : 몸체(4a)의 외면에 은으로 코팅하고, 몸체(4b)의 외면은 금으로 코팅하여서 된 전자시거.

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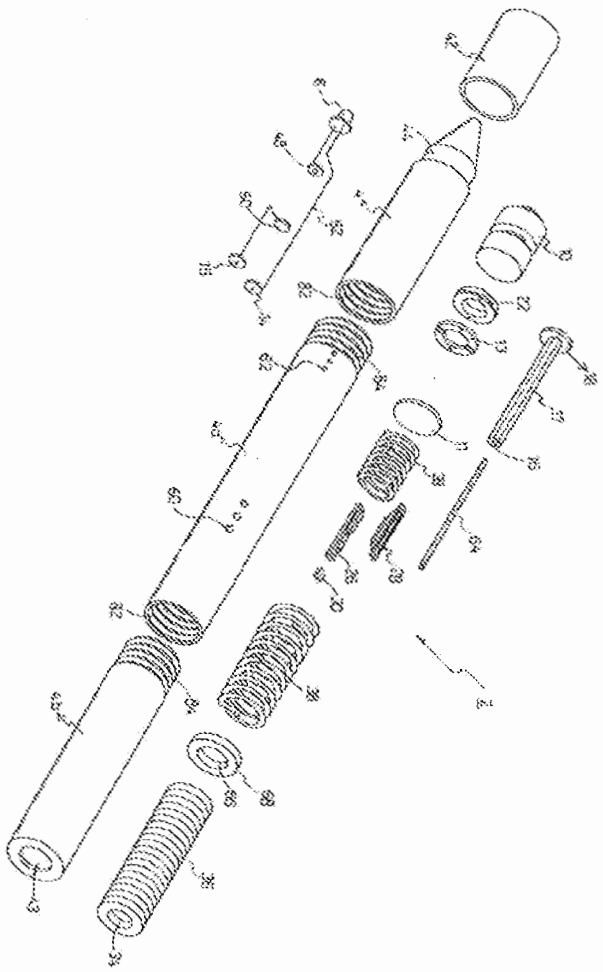
도면

도면 1



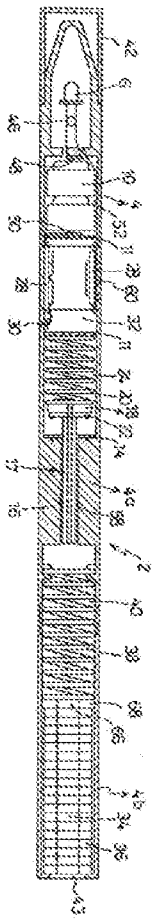
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도면 2



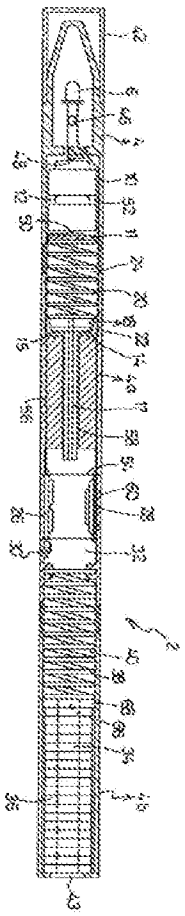
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도면 3



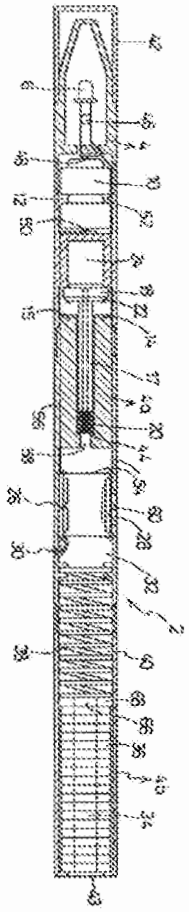
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도면 4

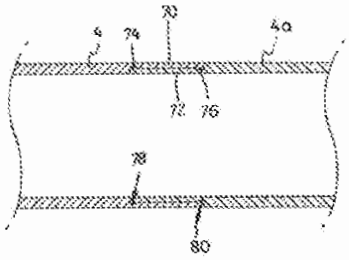


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도면 5

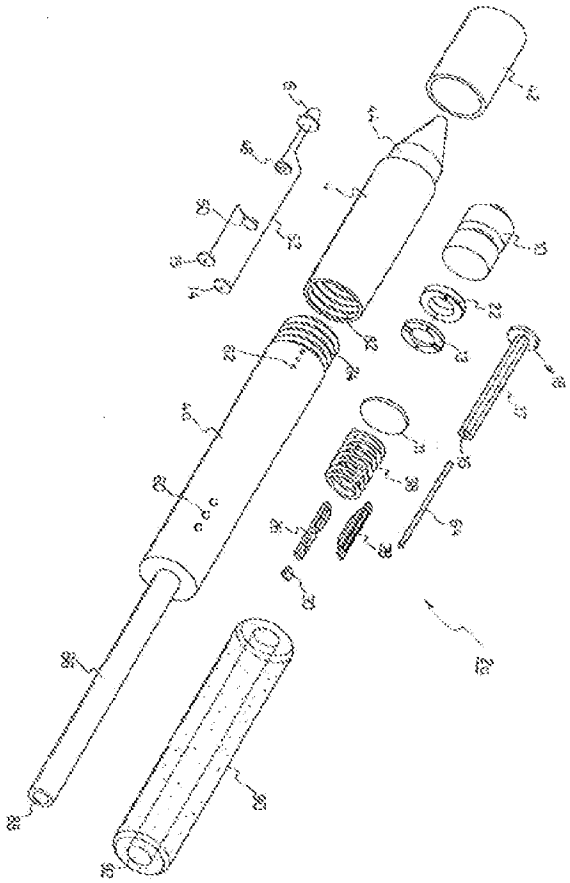


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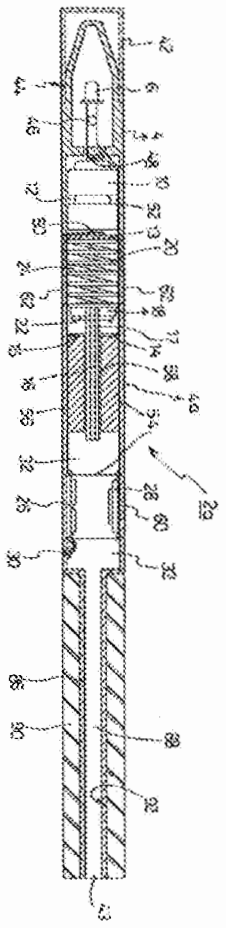
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도면 7

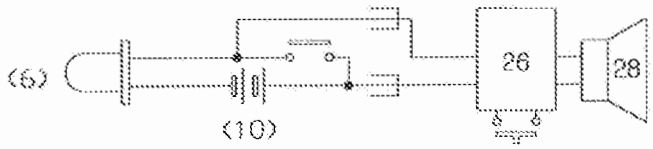


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도면 8



도면 9



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2018 년 2월19 일
특허청

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Electronic Patent Application Fee Transmittal

Application Number:	15879268
Filing Date:	24-Jan-2018
Title of Invention:	TOBACCO-CONTAINING SMOKING ARTICLE
First Named Inventor/Applicant Name:	John Howard Robinson
Filer:	Lauren F Anderson
Attorney Docket Number:	R60999 1400US.C5 (1777.4)

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

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($)
Miscellaneous:				
SUBMISSION- INFORMATION DISCLOSURE STMT	1806	1	240	240
		Total in USD ($)		**240**

Electronic Acknowledgement Receipt

EFS ID:	33593129
Application Number:	15879268
International Application Number:	
Confirmation Number:	9513
Title of Invention:	TOBACCO-CONTAINING SMOKING ARTICLE
First Named Inventor/Applicant Name:	John Howard Robinson
Customer Number:	26158
Filer:	Lauren F Anderson/Shari Elofson
Filer Authorized By:	Lauren F Anderson
Attorney Docket Number:	R60999 1400US.C5 (1777.4)
Receipt Date:	30-AUG-2018
Filing Date:	24-JAN-2018
Time Stamp:	17:43:32
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$240
RAM confirmation Number	083118INTEFSW00004796090528
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		R60999_1400US_C5_1777_4_Amendment_for_5-30-18_OA.pdf	31990 451bfa0223a6033779f2d3bc6d9e1d51c8654024	yes	7

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Claims	2	5
	Applicant Arguments/Remarks Made in an Amendment	6	7

Warnings:

Information:

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Warnings:					
Information:					
22	Non Patent Literature	NPL-MPL_Pressure_Switch_Solutions_Brochure_2006.pdf	8143927 5be5019de3fa9803981b98df7b5959e3d79ffc5a	no	17
Warnings:					
Information:					
23	Non Patent Literature	NPL-Fuchs_1989.pdf	5192180 40ebd3adf830ec0ac1c3da459a763eec14a3ff65	no	22
Warnings:					
Information:					
24	Non Patent Literature	NPL-Messler_2004.pdf	175002 37aae62d0fbab5d90e2b34c73a3ec4d0be029d6a	no	4
Warnings:					
Information:					
25	Non Patent Literature	NPL-Rohsenow_1961.pdf	678049 72b07095fdf6dd189d85e25d12fcaecf282aed31	no	3
Warnings:					
Information:					

26	Non Patent Literature	NPL-ThermalInk-JetPrintCartridgeDesignersGuide.pdf	668268 6f51fd3dcb2d7cbf36f7b05a88244dd562af8bd2	no	12
Warnings:					
Information:					
27	Non Patent Literature	NPL-YUNUS_Thermodynamics_2006.pdf	2001450 5d0d6507a90998b2cf7f0d75fed00b970f48530f	no	9
Warnings:					
Information:					
28	Fee Worksheet (SB06)	fee-info.pdf	30491 777c865dca29954199dae06c844fb77b637307cb	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	47452046	

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.

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

26158 7590 11/07/2018

WOMBLE BOND DICKINSON (US) LLP
ATTN: IP DOCKETING
P.O. BOX 7037
ATLANTA, GA 30357-0037

EXAMINER	
NGUYEN, PHU HOANG	
ART UNIT	PAPER NUMBER
1747	

DATE MAILED: 11/07/2018

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/879,268	01/24/2018	John Howard Robinson	R60999 1400US.C5 (1777.4)	9513

TITLE OF INVENTION: TOBACCO-CONTAINING SMOKING ARTICLE

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0.00	$0.00	$1000	02/07/2019

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 ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

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: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

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PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (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)

26158 7590 11/07/2018

WOMBLE BOND DICKINSON (US) LLP
ATTN: IP DOCKETING
P.O. BOX 7037
ATLANTA, GA 30357-0037

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 transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/879,268	01/24/2018	John Howard Robinson	R60999 1400US.C5 (1777.4)	9513

TITLE OF INVENTION: TOBACCO-CONTAINING SMOKING ARTICLE

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0.00	$0.00	$1000	02/07/2019

EXAMINER	ART UNIT	CLASS-SUBCLASS
NGUYEN, PHU HOANG	1747	131-200000

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 03-09 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 must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). 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. Fees submitted: ❑ Issue Fee ❑ Publication Fee (if required) ❑ Advance Order - # of Copies _____

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

❑ Electronic Payment via EFS-Web ❑ Enclosed check ❑ Non-electronic payment by credit card (Attach form PTO-2038)

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. **Change in Entity Status** (from status indicated above)

❑ Applicant certifying micro entity status. See 37 CFR 1.29

❑ Applicant asserting small entity status. See 37 CFR 1.27

❑ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

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UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/879,268	01/24/2018	John Howard Robinson	R60999 1400US.C5 (1777.4)	9513

26158 7590 11/07/2018

WOMBLE BOND DICKINSON (US) LLP
ATTN: IP DOCKETING
P.O. BOX 7037
ATLANTA, GA 30357-0037

EXAMINER	
NGUYEN, PHU HOANG	
ART UNIT	PAPER NUMBER
1747	

DATE MAILED: 11/07/2018

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

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.

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OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B 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 30 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.

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.

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Notice of Allowability	Application No. 15/879,268	Applicant(s) Robinson et al.	
	Examiner PHU H NGUYEN	Art Unit 1747	AIA Status No

-- 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 8/30/20/18.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

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 31-50 . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see **http://www.uspto.gov/patents/init_events/pph/index.jsp** or send an inquiry to **PPHfeedback@uspto.gov.**

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

   Certified copies:

   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 areply 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. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ 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).

6. ☐ 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. ☑ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.
5. ☐ Examiner's Amendment/Comment
6. ☑ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/PHU H NGUYEN/
Examiner, Art Unit 1747

Notice of Pre-AIA or AIA Status

The present application is being examined under the pre-AIA first to invent provisions.

Information Disclosure Statement

It is noted that the IDS filed 8/30/2018 contains an extremely large number of references for consideration by the Examiner. If the applicant and/or applicant's representative are aware of any particular reference or portion of a reference in the list which the examiner should take pay particular attention to it is requested that it be specifically pointed out in response to this Office action.

Allowable Subject Matter

The following is an examiner's statement of reasons for allowance: The Terminal Disclaimer approved on 8/30/2018 put the claimed invention in condition for allowance.

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."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PHU H NGUYEN whose telephone number is (571)272-5931. The examiner can normally be reached on M-F 9-5.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael H Wilson can be reached on 5712703882. 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.

/PHU H NGUYEN/
Examiner, Art Unit 1747

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/879,268	Robinson et al.
	Examiner	Art Unit
	PHU H NGUYEN	1747

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

CLAIMS

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

CLAIM		DATE								
Final	Original	03/19/2018	10/13/2018							
1	31	✓	=							
2	32	✓	=							
3	33	✓	=							
4	34	✓	=							
5	35	✓	=							
6	36	✓	=							
7	37	✓	=							
8	38	✓	=							
9	39	✓	=							
10	40	✓	=							
11	41	✓	=							
12	42	✓	=							
13	43	✓	=							
14	44	✓	=							
15	45	✓	=							
16	46	✓	=							
17	47	✓	=							
18	48	✓	=							
19	49	✓	=							
20	50	✓	=							

RAI Exhibit 2008
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PGR2024-00049
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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/879,268	Robinson et al.
	Examiner	Art Unit
	PHU H NGUYEN	1747

CPC - Searched*		
Symbol	Date	Examiner

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
See East Search History	3/19/2018	P.N
See East Search HIstory	10/13/2018	P.N

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
	See East Search History	10/13/2018	P.N

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Ecto World v. RAI
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Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/879,268	Robinson et al.
	Examiner	**Art Unit**
	PHU H NGUYEN	1747

CPC								
Symbol							**Type**	**Version**
A24F	/	47	/	008			F	2013-01-01
A24B	/	15	/	12			I	2013-01-01
A24D	/	1	/	002			I	2013-01-01
A24B	/	13	/	02			I	2013-01-01
A24B	/	15	/	167			I	2016-11-01
H05B	/	3	/	42			I	2013-01-01
H05B	/	2203	/	021			A	2013-01-01

CPC Combination Sets								
Symbol							**Type**	**Set**	**Ranking**	**Version**
	/		/							

N/A		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	20	
/PHU H NGUYEN/ Examiner, Art Unit 1747	13 October 2018	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

U.S. Patent and Trademark Office — Part of Paper No.: 20181013

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Ecto World v. RAI
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Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/879,268	Robinson et al.
	Examiner	**Art Unit**
	PHU H NGUYEN	1747

INTERNATIONAL CLASSIFICATION				
CLAIMED				
A24D1/00	/	1	/	00
A24F47/00	/	47	/	00
A24B15/16	/	15	/	16
A24B15/12	/	15	/	12
A24B13/02	/	13	/	02
H05B3/42	/	3	/	42

NON-CLAIMED				
	/		/	

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**
131	200

CROSS REFERENCES(S)						
CLASS	**SUBCLASS (ONE SUBCLASS PER BLOCK)**					
131	329	194	328	330		
128	205.25	203.26				

N/A (Assistant Examiner)	(Date)	**Total Claims Allowed:** 20	
/PHU H NGUYEN/ Examiner, Art Unit 1747 (Primary Examiner)	13 October 2018 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 1

U.S. Patent and Trademark Office

Part of Paper No.: 20181013

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Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/879,268	Robinson et al.
	Examiner	**Art Unit**
	PHU H NGUYEN	1747

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

CLAIMS

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	31	10	40	19	49										
2	32	11	41	20	50										
3	33	12	42												
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5	35	14	44												
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7	37	16	46												
8	38	17	47												
9	39	18	48												

N/A		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	20	
/PHU H NGUYEN/ Examiner, Art Unit 1747	13 October 2018	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

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				Application Number	15/879,268
				Filing Date	January 24, 2018
				First Named Inventor	John Howard Robinson
				Art Unit	1747
				Examiner Name	Phu Hoang Nguyen
Sheet	1	of	6	Attorney Docket Number	**R60999 1400US.C5 (1777.4)**

U. S. PATENT DOCUMENTS					
Examiner Initials*	Cite No.	Document Number Number - Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages of Relevant Figures Appear
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Examiner Signature		Date Considered	

*Examiner: Initial if reference 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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				Examiner Name	Phu Hoang Nguyen
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Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s) , volume-issue number(s), publisher, city and/or country where published.	English Language Translation Attached
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OTHER DOCUMENTS			
Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s) , volume-issue number(s), publisher, city and/or country where published.	English Language Translation Attached
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Examiner Signature	/PHU H NGUYEN/	Date Considered	10/13/2018

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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L2	593	("4924886" | "4945931" | "4947874" | "4947875" | "4961438" | "4966171" | "4969476" | "4972855" | "4977908" | "4981522" | "4986286" | "4991606" | "5019122" | "5020548" | "5025814" | "5033483" | "5040551" | "5042510" | "5046514" | "5050621" | "5060667" | "5060671" | "5060676" | "5065776" | "5072744" | "5074321" | "5076296" | "5076297" | "5092353" | "5093894" | "5099861" | "5101839" | "5105835" | "5105836" | "5105838" | "5115820" | "5144962" | "5146934" | "5148821" | "5159940" | "5159942" | "5178167" | "5183062" | "5203355" | "5211684" | "5224498" | "5240014" | "5240016" | "5249586" | "5261424" | "5271419" | "5285798" | "5293883" | "5322075" | "5327917" | "5345955" | "5353813" | "5357984" | "5360023" | "5369723" | "5388574" | "5388594" | "5396911" | "5408574" | "5468936" | "5498850" | "5505214" | "5515842" | "5530225" | "5533530" | "5551451" | "5564442" | "5588446" | "5593792" | "5595577" | "5598868" | "5649554" | "5665262" | "5666977" | "5666978" | "5687746" | "5692525" | "5715844" | "5726421" | "5727571" | "5743251" | "5778899" | "5799663" | "5819751" | "5819756" | "5829453" | "5865185" | "5865186" | "5878752" | "5880439" | "5894841" | "5915387" | "5934289" | "5954979" | "5967148" | "6033623" | "6040560" | "6053176" | "6089857" | "6095152" | "6095153" | "6125853" | "6146934" | "6155268" | "6164287" | "6182670" | "6196218" | "6196219" | "6234167" | "6289898" | "6397852" | "6408856" | "6516796" | "6532965" | "6537186" | "6578584" | "6591841" | "6598607" | "6601776" | "6615840" | "6688313" | "6730832" | "6772756" | "6803545" | "6823873" | "6854461" | "6854470" | "6994096" | "7117867" | "7293565" | "7513253" | "7775459" | "7832410" | "7845359" | "7896006" | "8079371" | "8127772" | "8314591" | "8365742" | "8402976" | "8499766" | "8528569" | "8550069" | "8899238").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/10/13 22:18
L3	1137	("0438310" | "0705919" | "0780087" | "1016844" | "1084304" | "1147416" | "1347631" | "1446087" | "1517584" |	US-PGPUB; USPAT; USOCR;	OR	OFF	2018/10/13 22:18

		"1879128" | "20010026788" | "20030011579" | "20030033055" | "20030108342" | "20030189826" | "20040149282" | "20040234916" | "20040261802" | "20050115243" | "20060093977" | "20070030306" | "20110120482" | "2032695" | "2086192" | "2140516" | "2461664" | "2472282" | "2545851" | "2959664" | "3060429" | "3203025" | "3234357" | "3281637" | "3292635" | "3385303" | "3428053" | "3431393" | "3502588" | "3651240" | "3685521" | "3685522" | "3747120" | "3860012" | "3933643" | "3934117" | "4016878" | "4207457" | "4219032" | "4270552" | "4506682" | "4531178" | "4589428" | "4629665" | "4637407" | "4676237" | "4771295" | "4771796" | "4797692" | "4878506" | "4941486" | "4945448" | "4945929" | "4968263" | "4990939" | "5005593" | "5124200" | "5129409" | "5177424" | "5224265" | "5255674" | "5266746" | "5327915" | "5372148" | "5497791" | "5646666" | "5703633" | "5732685" | "5745985" | "5944025" | "5996589" | "6062213" | "6102036" | "6217315" | "6232784" | "6285017" | "6311561" | "6322268" | "6476151" | "6501052" | "6620659" | "6690121" | "6719443" | "6722763" | "6885814" | "6938986" | "7159464" | "7284424" | "7337782" | "7445007" | "7997280" | "0000005" | "0726320" | "1514682" | "1771366" | "20020146242" | "20030131859" | "20030226837" | "20040020508" | "20040118401" | "20040129280" | "20040173229" | "20040198127" | "20040200488" | "20040226568" | "20050016549" | "20050016550" | "20050066986" | "20060016453" | "20060185687" | "20060196518" | "20070062549" | "20070074734" | "20070102013" | "20070215167" | "20070267031" | "20080085103" | "20080092912" | "20080257367" | "20080276947" | "20080302374" | "20090095311" | "20090095312" | "20090126745" | "20090188490" | "20090230117" | "20090272379" | "20090283103" | "20090320863" | "20100043809" | "20100083959" | "20100200006" | "20100229881" | "20100242974" | "20100307518" | "20100313901" | "20110005535" | "20110011396" | "20110036363" | "20110036365" | "20110094523" | "20110126848" | "20110155153" | "20110155718" | "20110168194" | "20110265806" | "20110309157" | "20120042885" | "20120060853" | "20120111347" | "20120132643" | "20120227752" | "20120231464" | "20120260927" | "20120279512" | "20120318882" |	FPRS; EPO; JPO; DERWENT; IBM_TDB				

		"20130037041" | "20130056013" | "20130081625" | "20130081642" | "20130192619" | "20130255702" | "20130306084" | "20130319439" | "20130340750" | "20130340775" | "20140000638" | "20140060554" | "20140060555" | "20140096781" | "20140096782" | "20140109921" | "20140157583" | "20140209105" | "20140253144" | "20140261408" | "20140261486" | "20140261487" | "20140261495" | "20140270727" | "20140270729" | "20140270730" | "20140345631" | "2057353" | "2104266" | "3200819" | "3258015" | "3356094" | "3479561" | "3486508" | "3516417" | "3614956" | "3738374" | "3766000" | "3844294" | "3878850" | "3931824" | "3943941" | "4044777" | "4079742" | "4190046" | "4219031" | "4233993" | "4284089" | "4286604" | "4303083" | "4326544" | "4340072" | "4347855" | "4391285" | "4635651" | "4700727" | "4714082" | "4735217" | "4756318" | "4771795" | "4793365" | "4800903" | "4807809" | "4819665" | "4823817" | "4836225" | "4848374" | "4874000" | "4892109" | "4893639" | "4907606" | "4917121" | "4917128" | "4920990" | "4922901").PN.				
L4	9	(L3 L2) and wicked and tobacco	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/10/13 22:18
S1	284	("20030131859" | "20040173229" | "20050016549" | "20050066986" | "20060185687" | "20060196518" | "20070062549" | "3258015" | "3356094" | "3516417" | "3614956" | "3738374" | "3844294" | "3878850" | "3931824" | "3943941" | "4044777" | "4079742" | "4190046" | "4219031" | "4233993" | "4284089" | "4286604" | "4326544" | "4340072" | "4347855" | "4391285" | "4635651" | "4700727" | "4714082" | "4735217" | "4756318" | "4771795" | "4793365" | "4800903" | "4807809" | "4819665" | "4823817" | "4836225" | "4848374" | "4874000" | "4892109" | "4893639" | "4917121" | "4917128" | "4920990" | "4924886" | "4947874" | "4961438" | "4966171" | "4969476" | "4972855" | "4977908" | "4991606" | "5020548" | "5025814" | "5033483" | "5040551" | "5050621" | "5060667" | "5060671" | "5060676" | "5065776" | "5072744" | "5074321" | "5076296" | "5076297" | "5092353" | "5099861" | "5101839" | "5105835" | "5105836" | "5105837" | "5105838" | "5115820" | "5146934" | "5148821" | "5159940" |	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2009/06/03 21:16

		"5159942" | "5178167" | "5183062" | "5203355" | "5211684" | "5224498" | "5240014" | "5240016" | "5271419" | "5285798" | "5293883" | "5327917" | "5345955" | "5357984" | "5360023" | "5369723" | "5388574" | "5396911" | "5533530" | "5551451" | "5588446" | "5593792" | "5595577" | "5598868" | "5692525" | "5715844" | "5743251" | "5778899" | "5799663" | "5819751" | "5829453" | "5865185" | "5878752" | "5880439" | "5915387" | "5934289" | "6033623" | "6053176" | "6089857" | "6095152" | "6146934" | "6164287" | "6182670" | "6234167" | "6289898" | "6397852" | "6408856" | "6516796" | "6532965" | "6537186" | "6578584" | "6591841" | "6598607" | "6615840" | "6730832" | "6823873" | "7117867").PN.				
S2	42	S1 and electrical	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2009/06/03 21:19
S4	2	"20080092912"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2009/06/03 21:46
S5	3	flameless near2 electronic near2 cigarette	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2009/06/04 12:58
S6	4	(("5093894") or ("5505214")).PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2009/06/04 13:40
S7	109	("1771366" | "1968509" | "2057353" | "2104266" | "2442004" | "2974669" | "3200819" | "3255760" | "3258015" | "3363633" | "3402723" | "3482580" | "3608560" | "3738374" | "3744496" | "3804100" | "3889690" | "4016061" | "4068672" | "4077784" | "4131119" | "4141369" | "4164230" | "4193411" | "4215708" | "4219032" | "4246913" | "4256945" | "4259970" | "4303083" | "4319591" | "4393884" | "4431903" | "4436100" | "4463247" | "4505282" | "4562337" | "4570646" | "4580583" | "4621649" | "4623401" | "4637407" | "4659912" | "4735217" | "4771796" | "4776353" | "4837421" | "4846199" | "4848376" | "4874924" | "4877989" | "4922901" | "4945931" | "4947874" | "4947875" | "4966171" | "4981522" | "4991606" | "5016656" | "5040552" | "5060671" | "5076296" | "5093894" | "5159940" | "5249586" | "5274214").PN. OR ("5505214").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2009/06/04 13:41

S8	284	("20030131859" | "20040173229" | "20050016549" | "20050066986" | "20060185687" | "20060196518" | "20070062549" | "3258015" | "3356094" | "3516417" | "3614956" | "3738374" | "3844294" | "3878850" | "3931824" | "3943941" | "4044777" | "4079742" | "4190046" | "4219031" | "4233993" | "4284089" | "4286604" | "4326544" | "4340072" | "4347855" | "4391285" | "4635651" | "4700727" | "4714082" | "4735217" | "4756318" | "4771795" | "4793365" | "4800903" | "4807809" | "4819665" | "4823817" | "4836225" | "4848374" | "4874000" | "4892109" | "4893639" | "4917121" | "4917128" | "4920990" | "4924886" | "4947874" | "4961438" | "4966171" | "4969476" | "4972855" | "4977908" | "4991606" | "5020548" | "5025814" | "5033483" | "5040551" | "5050621" | "5060667" | "5060671" | "5060676" | "5065776" | "5072744" | "5074321" | "5076296" | "5076297" | "5092353" | "5099861" | "5101839" | "5105835" | "5105836" | "5105837" | "5105838" | "5115820" | "5146934" | "5148821" | "5159940" | "5159942" | "5178167" | "5183062" | "5203355" | "5211684" | "5224498" | "5240014" | "5240016" | "5271419" | "5285798" | "5293883" | "5327917" | "5345955" | "5357984" | "5360023" | "5369723" | "5388574" | "5396911" | "5533530" | "5551451" | "5588446" | "5593792" | "5595577" | "5598868" | "5692525" | "5715844" | "5743251" | "5778899" | "5799663" | "5819751" | "5829453" | "5865185" | "5878752" | "5880439" | "5915387" | "5934289" | "6033623" | "6053176" | "6089857" | "6095152" | "6146934" | "6164287" | "6182670" | "6234167" | "6289898" | "6397852" | "6408856" | "6516796" | "6532965" | "6537186" | "6578584" | "6591841" | "6598607" | "6615840" | "6730832" | "6823873" | "7117867").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2009/06/04 13:55
S9	2	(S8 S7) and puff near2 controller	US-PGPUB; USPAT; USOCR	OR	ON	2009/06/04 13:55
S10	16	(S8 S7) and glycerin and (electrical electronic)	US-PGPUB; USPAT; USOCR	OR	ON	2009/06/04 14:28
S11	54	(S8 S7) and glycerin and extract	US-PGPUB; USPAT; USOCR	OR	ON	2009/06/04 16:33
S12	2	("20080092912").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2010/01/06 20:51
S13	18	aerosol near2 material and cartridge and electrica$4 and tobacco and heat$4 near2	US-PGPUB; USPAT;	OR	ON	2010/01/06 21:08

		element	USOCR; EPO; JPO; DERWENT			
S14	497	("2881770" | "20020000235" | "20020014453" | "20030075193" | "20030114298" | "20030131859" | "20030154993" | "20040084056" | "20040107973" | "20040134631" | "20040173229" | "20040194792" | "20040217023" | "20040226569" | "20040237984" | "20040255965" | "20040256253" | "20040261807" | "20050005947" | "20050016549" | "20050016556" | "20050049128" | "20050066983" | "20050066984" | "20050066986" | "20050076929" | "20050133051" | "20050133052" | "20050150786" | "20050194014" | "20050252693" | "20050274390" | "20060021624" | "20060025292" | "20070023056" | "20070190347" | "3101723" | "3217715" | "3258015" | "3263244" | "3308600" | "3347247" | "3356094" | "3370595" | "3419015" | "3516417" | "3614956" | "3648711" | "3738374" | "3844294" | "3878850" | "3931824" | "3943941" | "3957563" | "3972335" | "4044777" | "4054145" | "4079742" | "4174720" | "4201234" | "4219031" | "4223597" | "4233993" | "4280187" | "4281670" | "4286604" | "4294353" | "4326544" | "4340072" | "4347855" | "4391285" | "4449541" | "4508525" | "4534463" | "4700727" | "4714082" | "4715497" | "4756318" | "4771795" | "4793365" | "4807809" | "4823817" | "4836224" | "4848374" | "4852734" | "4874000" | "4881556" | "4887619" | "4893637" | "4893639" | "4903714" | "4917121" | "4917128" | "4920990" | "4924883" | "4924886" | "4924888" | "4938238" | "4947874" | "4961438" | "4966171" | "4969476" | "4977908" | "4989619" | "4991606" | "4995405" | "5012829" | "5020548" | "5022416" | "5025814" | "5027836" | "5027837" | "5033483" | "5040551" | "5046514" | "5050621" | "5052413" | "5056537" | "5060676" | "5065776" | "5067499" | "5072744" | "5074320" | "5074321" | "5076295" | "5076296" | "5076297" | "5088507" | "5092353" | "5099861" | "5101839" | "5103842" | "5105831" | "5105834" | "5105835" | "5105836" | "5105837" | "5105838" | "5115820" | "5129409" | "5137034" | "5139140" | "5146934" | "5148821" | "5156170" | "5159940" | "5159942" | "5159944" | "5178167" | "5183062" | "5203355" | "5211684" | "5220930" | "5224498" | "5240014" | "5240016" | "5247947" | "5261425" | "5271419" | "5285798" | "5303720" | "5327917" | "5345955" | "5357984" | "5360023"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2010/01/06 21:13

		"5369723" | "5396909" | "5396911" | "5462073" | "5469871" | "5533530" | "5546965" | "5551451" | "5560376" | "5568819" | "5588446" | "5593792" | "5595577" | "5598868" | "5622190" | "5699812" | "5706834" | "5711320" | "5715844" | "5718250" | "5727571" | "5778899" | "5819751" | "5829453" | "5865185" | "5874508" | "5878752" | "5880439" | "5902431" | "5915387" | "5934289" | "5938018" | "5944025" | "6089857" | "6095152" | "6164287" | "6182670" | "6229115" | "6367481" | "6378528" | "6397852" | "6408856" | "6530377" | "6537186" | "6578584" | "6584979" | "6595218" | "6615842" | "6631722" | "6656412" | "6730832" | "6761174" | "6779528" | "6789547" | "6805174" | "6814786" | "6823873" | "6848450" | "6907885" | "6913784" | "7004896").PN.				
S17	2	("20120060853").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2014/01/27 13:59
S18	598	("2881770" | "20020000235" | "20020014453" | "20030075193" | "20030114298" | "20030131859" | "20030154993" | "20040084056" | "20040107973" | "20040134631" | "20040173229" | "20040194792" | "20040217023" | "20040226569" | "20040237984" | "20040255965" | "20040256253" | "20040261807" | "20050005947" | "20050016549" | "20050016556" | "20050049128" | "20050066983" | "20050066984" | "20050066986" | "20050076929" | "20050133051" | "20050133052" | "20050150786" | "20050194014" | "20050252693" | "20050274390" | "20060021624" | "20060025292" | "20070023056" | "20070190347" | "3101723" | "3217715" | "3258015" | "3263244" | "3308600" | "3347247" | "3356094" | "3370595" | "3419015" | "3516417" | "3614956" | "3648711" | "3738374" | "3844294" | "3878850" | "3931824" | "3943941" | "3957563" | "3972335" | "4044777" | "4054145" | "4079742" | "4174720" | "4201234" | "4219031" | "4223597" | "4233993" | "4280187" | "4281670" | "4286604" | "4294353" | "4326544" | "4340072" | "4347855" | "4391285" | "4449541" | "4508525" | "4534463" | "4700727" | "4714082" | "4715497" | "4756318" | "4771795" | "4793365" | "4807809" | "4823817" | "4836224" | "4848374" | "4852734" | "4874000" | "4881556" | "4887619" | "4893637" | "4893639" | "4903714" | "4917121" | "4917128" | "4920990" | "4924883" | "4924886" |	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2014/01/28 16:59

		"4924888" | "4938238" | "4947874" | "4961438" | "4966171" | "4969476" | "4977908" | "4989619" | "4991606" | "4995405" | "5012829" | "5020548" | "5022416" | "5025814" | "5027836" | "5027837" | "5033483" | "5040551" | "5046514" | "5050621" | "5052413" | "5056537" | "5060676" | "5065776" | "5067499" | "5072744" | "5074320" | "5074321" | "5076295" | "5076296" | "5076297" | "5088507" | "5092353" | "5099861" | "5101839" | "5103842" | "5105831" | "5105834" | "5105835" | "5105836" | "5105837" | "5105838" | "5115820" | "5129409" | "5137034" | "5139140" | "5146934" | "5148821" | "5156170" | "5159940" | "5159942" | "5159944" | "5178167" | "5183062" | "5203355" | "5211684" | "5220930" | "5224498" | "5240014" | "5240016" | "5247947" | "5261425" | "5271419" | "5285798" | "5303720" | "5327917" | "5345955" | "5357984" | "5360023" | "5369723" | "5396909" | "5396911" | "5462073" | "5469871" | "5533530" | "5546965" | "5551451" | "5560376" | "5568819" | "5588446" | "5593792" | "5595577" | "5598868" | "5622190" | "5699812" | "5706834" | "5711320" | "5715844" | "5718250" | "5727571" | "5778899" | "5819751" | "5829453" | "5865185" | "5874508" | "5878752" | "5880439" | "5902431" | "5915387" | "5934289" | "5938018" | "5944025" | "6089857" | "6095152" | "6164287" | "6182670" | "6229115" | "6367481" | "6378528" | "6397852" | "6408856" | "6530377" | "6537186" | "6578584" | "6584979" | "6595218" | "6615842" | "6631722" | "6656412" | "6730832" | "6761174" | "6779528" | "6789547" | "6805174" | "6814786" | "6823873" | "6848450" | "6907885" | "6913784" | "7004896").PN.				
S19	38	S18 and cartridge	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2014/01/28 16:59
S20	29	A24F47/$ and cartridge and substrate	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2014/01/28 17:00
S22	4	(("20120060853") or ("7726320")).PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2014/01/28 17:02
S24	21	A24F$/$ and polyethylene near2 terephthalate and electronic	US-PGPUB; USPAT; USOCR; EPO; JPO;	OR	ON	2014/01/29 17:14

			DERWENT			
S27	18	polyethylene near2 terephthalate and electronic and absorbent and tobacco and smoking	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2014/01/29 17:17
S28	359	("20030131859" | "20040173229" | "20050016549" | "20050066986" | "20060185687" | "20060196518" | "20070062549" | "3258015" | "3356094" | "3516417" | "3614956" | "3738374" | "3844294" | "3878850" | "3931824" | "3943941" | "4044777" | "4079742" | "4190046" | "4219031" | "4233993" | "4284089" | "4286604" | "4326544" | "4340072" | "4347855" | "4391285" | "4635651" | "4700727" | "4714082" | "4735217" | "4756318" | "4771795" | "4793365" | "4800903" | "4807809" | "4819665" | "4823817" | "4836225" | "4848374" | "4874000" | "4892109" | "4893639" | "4917121" | "4917128" | "4920990" | "4924886" | "4947874" | "4961438" | "4966171" | "4969476" | "4972855" | "4977908" | "4991606" | "5020548" | "5025814" | "5033483" | "5040551" | "5050621" | "5060667" | "5060671" | "5060676" | "5065776" | "5072744" | "5074321" | "5076296" | "5076297" | "5092353" | "5099861" | "5101839" | "5105835" | "5105836" | "5105837" | "5105838" | "5115820" | "5146934" | "5148821" | "5159940" | "5159942" | "5178167" | "5183062" | "5203355" | "5211684" | "5224498" | "5240014" | "5240016" | "5271419" | "5285798" | "5293883" | "5327917" | "5345955" | "5357984" | "5360023" | "5369723" | "5388574" | "5396911" | "5533530" | "5551451" | "5588446" | "5593792" | "5595577" | "5598868" | "5692525" | "5715844" | "5743251" | "5778899" | "5799663" | "5819751" | "5829453" | "5865185" | "5878752" | "5880439" | "5915387" | "5934289" | "6033623" | "6053176" | "6089857" | "6095152" | "6146934" | "6164287" | "6182670" | "6234167" | "6289898" | "6397852" | "6408856" | "6516796" | "6532965" | "6537186" | "6578584" | "6591841" | "6598607" | "6615840" | "6730832" | "6823873" | "7117867").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2014/01/29 17:17
S31	713	(polyethylene near2 terephthalate near2 fiber) same (carbon near2 fiber)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2014/01/29 17:20
S32	12	(polyethylene near2 terephthalate near2 fiber) same (carbon near2 fiber) and base near2 web	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2014/01/29 17:20

S33	65	(polyethylene near2 terephthalate near2 fiber) same (carbon near2 fiber) and absorbent	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2014/01/29 17:34
S34	28	(polyethylene near2 terephthalate near2 fiber) same bio	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2014/02/02 00:35
S38	2	("3486508").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2014/02/02 01:31
S40	22	A24F$/$ and paper same "metallic foil"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2014/02/02 01:32
S42	14	A24F$/$ and paper and base near2 web and calcium near carbonate	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2014/02/03 15:41
S43	2	("8079371").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2014/02/03 21:22
S44	7	cigarette near2 paper and carbon near2 fiber and carbon near2 particle and carbonate near2 particle	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2014/08/02 23:31
S45	0	(A24B15/165).cpc. and controller and aerosol and heater	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2014/08/02 23:32
S46	2	(A24B15/14).cpc. and controller and aerosol and heater	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2014/08/02 23:32
S47	0	(A24D1/18).cpc. and controller and aerosol and heater	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2014/08/02 23:33
S49	142	("1771366" | "2057353" | "2104266" | "20020146242" | "20030226837" | "20040129280" | "20040200488" | "20040226568" | "20050016550" | "20060016453" | "20060196518" | "20070074734" | "20070102013" | "20070215167" | "3200819" | "4303083" | "4907606" | "4945931" | "4986286" | "5019122" | "5042510" | "5093894" | "5261424" | "5353813" | "5408574" |	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2014/09/29 23:59

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S50	1	S49 and glycerin and (electrical electronic) and controller	US-PGPUB; USPAT; USOCR	OR	ON	2014/09/30 00:00
S53	122	smoking near2 article and tobacco near extract and heater	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2016/10/02 20:40
S54	2	("8899238").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2016/10/02 21:47
S55	0	(smoking and puff and carrier and wick and heater and controller).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2016/10/02 21:55
S56	1	(smoking and puff and carrier and wick$3 and heater and controller).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2016/10/02 21:55
S58	4	(("7726320") or ("8899238")).PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2017/04/01 01:42
S59	2	("20150047656").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2017/04/01 01:46
S60	6	(("7726320") or ("8899238") or ("8079371")).PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2017/04/01 02:00
S61	2	("20150047656").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2017/04/01 13:33
S62	2	(smoking and puff and carrier and wick$3 and heater and controller).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO;	OR	ON	2017/04/01 13:46

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S64	921	("1771366" | "2057353" | "2104266" | "20020146242" | "20030131859" | "20030226837" | "20040020508" | "20040118401" | "20040129280" | "20040173229" | "20040198127" | "20040200488" | "20040226568" | "20050016549" | "20050016550" | "20050066986" | "20060016543" | "20060185687" | "20060196518" | "20070062549" | "20070074734" | "20070102013" | "20070215167" | "20070267031" | "20080085103" | "20080092912" | "20080257374" | "20090095311" | "20090095312" | "20090126745" | "20090188490" | "20090230117" | "20090272379" | "20090283103" | "20090320863" | "20100043809" | "20100083959" | "20100200006" | "20100229881" | "20100242974" | "20100307518" | "20100313901" | "20110005535" | "20110011396" | "20110036363" | "20110036365" | "20110094523" | "20110126848" | "20110155153" | "20110155718" | "20110168194" | "20110265806" | "20110309157" | "20120042885" | "20120060823" | "20120060853" | "20120111347" | "20120132643" | "20120227752" | "20120231464" | "20120260927" | "20120279512" | "20120318882" | "20130037041" | "20130056013" | "20130081625" | "20130081642" | "20130192619" | "20130255702" | "20130306084" | "20130319439" | "20130340750" | "20130340775" | "20140000638" | "20140060554" | "20140060555" | "20140096781" | "20140096782" | "20140109921" | "20140157583" | "20140209105" | "20140253144" | "20140261408" | "20140261486" | "20140261487" | "20140261495" | "20140270727" | "20140270729" | "20140270730" | "20140345631" | "3200819" | "3258015" | "3486508" | "3516417" | "3614956" | "3738274" | "3766000" | "3844294" | "3878850" | "3931824" | "3943941" | "4044777" | "4079742" | "4190046" | "4219031" | "4233993" | "4284089" | "4286604" | "4303083" | "4326544" | "4340072" | "4347855" | "4391285" | "4636561" | "4700727" | "4714082" | "4735217" | "4756318" | "4771995" | "4793365" | "4800903" | "4807809" | "4819665" | "4823817" | "4836225" | "4848374" | "4874000" | "4892109" | "4893639" | "4907606" | "4917121" | "4917128" | "4920990" | "4922901" | "4924886" | "4945931" | "4947874" | "4947875" | "4961438" | "4966171" | "4969476" | "4972855" | "4977908" | "4981522" | "4986286" | "5019122"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2017/06/19 23:29

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S65	7	S64 and carrier and wick and extract and mainstream and cartridge	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2017/06/20 00:04
S66	1	("15286087").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2017/09/28 22:53
S69	3	("5666978").PN.	US-PGPUB; USPAT; USOCR; EPO; DERWENT	OR	OFF	2018/01/12 00:27
S70	76	ep near2 "0503767"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2018/01/12 00:28
S71	3	ep near2 "2949114"	US-PGPUB; USPAT; USOCR; FPRS;	OR	OFF	2018/01/12 00:30

			EPO; JPO; DERWENT			
S74	3	"15286087"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2018/03/19 10:20
S77	9	"14527287"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2018/03/19 10:21
S78	216	A24F$/$ and polyethylene near2 terephthalate and electronic	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2018/05/23 00:10
S79	33	(("9901123") or ("9801416") or ("8899238") or ("8079371") or ("7726320")).PN.	US-PGPUB; USPAT; USOCR; EPO; DERWENT	OR	OFF	2018/05/23 00:11
S80	3	("5692525").PN.	US-PGPUB; USPAT; USOCR; EPO; DERWENT	OR	OFF	2018/05/24 10:28
S83	593	("4924886" | "4945931" | "4947874" | "4947875" | "4961438" | "4966171" | "4969476" | "4972855" | "4977908" | "4981522" | "4986286" | "4991606" | "5019122" | "5020548" | "5025814" | "5033483" | "5040551" | "5042510" | "5046514" | "5050621" | "5060667" | "5060671" | "5060676" | "5065776" | "5072744" | "5074321" | "5076296" | "5076297" | "5092353" | "5093894" | "5099861" | "5101839" | "5105835" | "5105836" | "5105838" | "5115820" | "5144962" | "5146934" | "5148821" | "5159940" | "5159942" | "5178167" | "5183062" | "5203355" | "5211684" | "5224498" | "5240014" | "5240016" | "5249586" | "5261424" | "5271419" | "5285798" | "5293883" | "5322075" | "5327917" | "5345955" | "5353813" | "5357984" | "5360023" | "5369723" | "5388574" | "5388594" | "5396911" | "5408574" | "5468936" | "5498850" | "5505214" | "5515842" | "5530225" | "5533530" | "5551451" | "5564442" | "5588446" | "5593792" | "5595577" | "5598868" | "5649554" | "5665262" | "5666977" | "5666978" | "5687746" | "5692525" | "5715844" | "5726421" | "5727571" | "5743251" | "5778899" | "5799663" | "5819751" | "5819756" | "5829453" | "5865185" | "5865186" | "5878752" | "5880439" | "5894841" | "5915387" | "5934289" | "5954979" |	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/10/13 15:18

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EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L5	6	(tobacco and electric$3 and heater and aerosol and wicked).clm.	US-PGPUB; USPAT	OR	ON	2018/10/13 22:21
S16	1	(tobacco and aerosol and heating and cartridge).clm.	USPAT	OR	ON	2010/01/11 13:26
S48	5	(tobacco and tub$3 and electric$3 and heater and aerosol).clm.	US-PGPUB; USPAT	OR	ON	2014/08/02 23:34

S51	0	(tobacco and tub$3 and electric$3 and heater and aerosol and absorbent).clm.	US-PGPUB; USPAT	OR	ON	2014/09/30 00:14
S52	1	(tobacco and electric$3 and heater and aerosol and absorbent).clm.	US-PGPUB; USPAT	OR	ON	2014/09/30 00:15
S57	1	(smoking and puff and carrier and wick$3 and heater and controller).clm.	US-PGPUB; USPAT	OR	ON	2016/10/02 21:55
S63	2	(smoking and puff and carrier and wick$3 and heater and controller).clm.	US-PGPUB; USPAT	OR	ON	2017/06/19 22:26
S67	2	(smoking and puff and carrier and wick$3 and heater and controller).clm.	US-PGPUB; USPAT	OR	ON	2017/09/28 22:58
S68	2	(smoking and carrier and wick$3 and heater and controller).clm.	US-PGPUB; USPAT	OR	ON	2017/09/28 22:58
S72	3	(smoking and carrier and wick$3 and heater and controller).clm.	US-PGPUB; USPAT	OR	ON	2018/01/12 00:33
S73	7	(tobacco and electric$3 and heater and aerosol and absorbent).clm.	US-PGPUB; USPAT	OR	ON	2018/01/12 00:33

10/ 13/ 2018 10:23:48 PM
C:\ Users\ pnguyen9\ Documents\ EAST\ Workspaces\ 15879268.wsp

Bibliographic Data

Application No: 15/879,268

Foreign Priority claimed: ○ Yes ◉ No

35 USC 119 (a-d) conditions met: ☐ Yes ☑ No ☐ Met After Allowance

Verified and Acknowledged: /PHU H NGUYEN/ (Examiner's Signature) P.N (Initials)

Title: TOBACCO-CONTAINING SMOKING ARTICLE

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
01/24/2018	131	1747	R60999 1400US.C5 (1777.4)
RULE			

APPLICANTS

RAI Strategic Holdings, Inc., Winston-Salem, NC,

INVENTORS

John Howard Robinson Kernersville, NC, UNITED STATES

David William Griffith JR., Winston-Salem, NC, UNITED STATES

Billy Tyrone Conner Clemmons, NC, UNITED STATES

Evon Llewellyn Crooks Mocksville, NC, UNITED STATES

Dempsey Bailey Brewer JR., East Bend, NC, UNITED STATES

CONTINUING DATA

This application is a CON of 15286087 10/05/2016 PAT 9901123

15286087 is a CON of 14527287 10/29/2014 PAT 9801416

14527287 is a CON of 13297983 11/16/2011 PAT 8899238

13297983 is a CON of 12763890 04/20/2010 PAT 8079371

12763890 is a CON of 11550634 10/18/2006 PAT 7726320

FOREIGN APPLICATIONS

IF REQUIRED, FOREIGN LICENSE GRANTED**

STATE OR COUNTRY

UNITED STATES

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ATLANTA, GA 30357-0037
UNITED STATES

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/879,268	01/24/2018	John Howard Robinson	R60999 1400US.C5 (1777.4)	9513

26158 7590 12/26/2018

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EXAMINER	
NGUYEN, PHU HOANG	

ART UNIT	PAPER NUMBER
1747	

NOTIFICATION DATE	DELIVERY MODE
12/26/2018	ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

BostonPatents@wbd-us.com
IPDocketing@wbd-us.com

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Corrected ***Notice of Allowability***	**Application No.** 15/879,268	**Applicant(s)** Robinson et al.	
	Examiner PHU H NGUYEN	**Art Unit** 1747	**AIA Status** No

-- 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 _____.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

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 _____ . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see **http://www.uspto.gov/patents/init_events/pph/index.jsp** or send an inquiry to **PPHfeedback@uspto.gov.**

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

   Certified copies:

   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 areply 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. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ 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).

6. ☐ 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. ☑ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☑ Interview Summary (PTO-413), Paper No./Mail Date. _____.
5. ☐ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/PHU H NGUYEN/
Examiner, Art Unit 1747

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Examiner-Initiated Interview Summary	**Application No.** 15/879,268	**Applicant(s)** Robinson et al.	
	Examiner PHU H NGUYEN	**Art Unit** 1747	**AIA Status** No

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

(1) PHU H. NGUYEN. (3) _____.

(2) Lauren Anderson. (4) _____.

Date of Interview: 12 December 2018.

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: _____.

Identification of prior art discussed: _____.

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 meant to cite US-7,726,320 instead of US-7,26,320 on entry #189 sheet 8 of 13. Please see the attached IDS dated 1/24/2018 for the correction..

Applicant recordation instructions: It is not necessary for applicant to provide a separate record of the substance of 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

/PHU H NGUYEN/ Examiner, Art Unit 1747	

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				First Named Inventor	John Howard Robinson
				Art Unit	*To Be Assigned*
				Examiner Name	*To Be Assigned*
Sheet	1	of	13	Attorney Docket Number	**R60999 1400US.C5 (1777.4)**

U. S. PATENT DOCUMENTS					
Examiner Initials*	Cite No.	Document Number Number - Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages of Relevant Figures Appear
	1	US-1,514,682	11-11-1924	Wilson	
	2	US-1,771,366	07-22-1930	Wyss et al.	
	3	US-2,057,353	10-13-1936	Whittemore, Jr.	
	4	US-2,104,266	01-04-1938	McCormick	
	5	US-3,200,819	08-17-1965	Gilbert	
	6	US-3,258,015	06-28-1966	Ellis et al.	
	7	US-3,356,094	12-05-1967	Ellis et al.	
	8	US-3,479,561	11-18-1969	Janning	
	9	US-3,486,508	12-30-1969	Sipos	
	10	US-3,516,417	06-23-1970	Moses	
	11	US-3,614,956	10-26-1971	Thornton	
	12	US-3,738,374	06-12-1973	Bennett	
	13	US-3,766,000	10-16-1973	Gibson	
	14	US-3,844,294	10-29-1974	Webster	
	15	US-3,878,850	04-22-1975	Gibson et al.	
	16	US-3,931,824	01-13-1976	Miano et al.	
	17	US-3,943,941	03-16-1976	Boyd et al.	
	18	US-4,044,777	08-30-1977	Boyd et al.	
	19	US-4,079,742	03-21-1978	Rainer et al.	
	20	US-4,190,046	02-26-1980	Virag	
	21	US-4,219,031	08-26-1980	Rainer et al.	
	22	US-4,233,993	11-18-1980	Miano et al.	
	23	US-4,284,089	08-18-1981	Ray	
	24	US-4,286,604	09-01-1981	Ehretsmann et al.	

Examiner Signature		Date Considered	

*Examiner: Initial if reference 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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				Examiner Name	*To Be Assigned*
Sheet	2	of	13	Attorney Docket Number	**R60999 1400US.C5 (1777.4)**

U. S. PATENT DOCUMENTS					
	25	US-4,303,083	12-01-1981	Burruss, Jr.	
	26	US-4,326,544	04-27-1982	Hardwick et al.	
	27	US-4,340,072	07-20-1982	Bolt et al.	
	28	US-4,347,855	09-07-1982	Lanzillotti et al.	
	29	US-4,391,285	07-05-1983	Burnett et al.	
	30	US-4,635,651	01-13-1987	Jacobs	
	31	US-4,700,727	10-20-1987	Torigian	
	32	US-4,714,082	12-22-1987	Banerjee et al.	
	33	US-4,735,217	04-05-1988	Gerth et al.	
	34	US-4,756,318	07-12-1988	Clearman et al.	
	35	US-4,771,795	09-20-1988	White et al.	
	36	US-4,793,365	12-27-1988	Sensabaugh, Jr. et al.	
	37	US-4,800,903	01-31-1989	Ray et al.	
	38	US-4,807,809	02-28-1989	Pryor et al.	
	39	US-4,819,665	04-11-1989	Roberts et al.	
	40	US-4,823,817	04-25-1989	Luke	
	41	US-4,836,225	06-06-1989	Sudoh	
	42	US-4,848,374	07-18-1989	Chard et al.	
	43	US-4,874,000	10-17-1989	Tamol et al.	
	44	US-4,892,109	01-09-1990	Strubel	
	45	US-4,893,639	01-16-1990	White	
	46	US-4,907,606	03-13-1990	Lilja et al.	
	47	US-4,917,121	04-17-1990	Riehl et al.	
	48	US-4,917,128	04-17-1990	Clearman et al.	
	49	US-4,920,990	05-01-1990	Lawrence et al.	
	50	US-4,922,901	05-08-1990	Brooks et al.	
	51	US-4,924,886	05-15-1990	Litzinger	

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Sheet	3	of	13	Attorney Docket Number	**R60999 1400US.C5 (1777.4)**

U. S. PATENT DOCUMENTS					
	52	US-4,945,931	08-07-1990	Gori	
	53	US-4,947,874	08-14-1990	Brooks et al.	
	54	US-4,947,875	08-14-1990	Brooks et al.	
	55	US-4,961,438	10-09-1990	Korte	
	56	US-4,966,171	10-30-1990	Serrano et al.	
	57	US-4,969,476	11-13-1990	Bale et al.	
	58	US-4,972,855	11-27-1990	Kuriyama et al.	
	59	US-4,977,908	12-18-1990	Luke	
	60	US-4,981,522	01-01-1991	Nichols et al.	
	61	US-4,986,286	01-22-1991	Roberts et al.	
	62	US-4,991,606	02-12-1991	Serrano et al.	
	63	US-5,019,122	05-28-1991	Clearman et al.	
	64	US-5,020,548	06-04-1991	Farrier et al.	
	65	US-5,025,814	06-25-1991	Raker	
	66	US-5,033,483	07-23-1991	Clearman et al.	
	67	US-5,040,551	08-20-1991	Schlatter et al.	
	68	US-5,042,510	08-27-1991	Curtiss et al.	
	69	US-5,046,514	09-10-1991	Bolt	
	70	US-5,050,621	09-24-1991	Creighton et al.	
	71	US-5,060,667	10-29-1991	Strubel	
	72	US-5,060,671	10-29-1991	Counts et al.	
	73	US-5,060,676	10-29-1991	Hearn et al.	
	74	US-5,065,776	11-19-1991	Lawson et al.	
	75	US-5,072,744	12-17-1991	Luke et al.	
	76	US-5,074,321	12-24-1991	Gentry et al.	
	77	US-5,076,296	12-31-1991	Nystrom et al.	
	78	US-5,076,297	12-31-1991	Farrier et al.	

Examiner Signature		Date Considered	

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Sheet	4	of	13	Attorney Docket Number	**R60999 1400US.C5 (1777.4)**

U. S. PATENT DOCUMENTS					
	79	US-5,092,353	03-03-1992	Montoya et al.	
	80	US-5,093,894	03-03-1992	Deevi et al.	
	81	US-5,099,861	03-31-1992	Clearman et al.	
	82	US-5,101,839	04-07-1992	Jakob et al.	
	83	US-5,105,835	04-21-1992	Drewett et al.	
	84	US-5,105,836	04-21-1992	Gentry et al.	
	85	US-5,105,837	04-21-1992	Barnes et al.	
	86	US-5,105,838	04-21-1992	White et al.	
	87	US-5,115,820	05-26-1992	Hauser et al.	
	88	US-5,144,962	09-08-1992	Counts et al.	
	89	US-5,146,934	09-15-1992	Deevi et al.	
	90	US-5,148,821	09-22-1992	Best et al.	
	91	US-5,159,940	11-03-1992	Hayward et al.	
	92	US-5,159,942	11-03-1992	Brinkley et al.	
	93	US-5,178,167	01-12-1993	Riggs et al.	
	94	US-5,183,062	02-02-1993	Clearman et al.	
	95	US-5,203,355	04-20-1993	Clearman et al.	
	96	US-5,211,684	05-18-1993	Shannon et al.	
	97	US-5,224,498	07-06-1993	Deevi et al.	
	98	US-5,240,014	08-31-1993	Deevi et al.	
	99	US-5,240,016	08-31-1993	Nichols et al.	
	100	US-5,249,586	10-05-1993	Morgan et al.	
	101	US-5,261,424	11-16-1993	Sprinkel, Jr.	
	102	US-5,271,419	12-21-1993	Arzonico et al.	
	103	US-5,285,798	02-15-1994	Banerjee et al.	
	104	US-5,293,883	03-15-1994	Edwards	
	105	US-5,322,075	06-21-1994	Deevi et al.	

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U. S. PATENT DOCUMENTS					
	106	US-5,327,917	07-12-1994	Lekwauwa et al.	
	107	US-5,345,955	09-13-1994	Clearman et al.	
	108	US-5,353,813	10-11-1994	Deevi et al.	
	109	US-5,357,984	10-25-1994	Farrier et al.	
	110	US-5,360,023	11-01-1994	Blakley et al.	
	111	US-5,369,723	11-29-1994	Counts et al.	
	112	US-5,372,148	12-13-1994	McCafferty et al.	
	113	US-5,388,574	02-14-1995	Ingebrethsen	
	114	US-5,388,594	02-14-1995	Counts et al.	
	115	US-5,396,911	03-14-1995	Casey, III et al.	
	116	US-5,408,574	04-18-1995	Deevi et al.	
	117	US-5,468,936	11-21-1995	Deevi et al.	
	118	US-5,498,850	03-12-1996	Das	
	119	US-5,505,214	04-09-1996	Collins et al.	
	120	US-5,515,842	05-14-1996	Ramseyer et al.	
	121	US-5,530,225	06-25-1996	Hajaligol	
	122	US-5,533,530	07-09-1996	Young et al.	
	123	US-5,551,451	09-03-1996	Riggs et al.	
	124	US-5,564,442	10-15-1996	MacDonald et al.	
	125	US-5,588,446	12-31-1996	Clearman	
	126	US-5,593,792	01-14-1997	Farrier et al.	
	127	US-5,595,577	01-21-1997	Bensalem et al.	
	128	US-5,598,868	02-04-1997	Jakob et al.	
	129	US-5,649,554	07-22-1997	Sprinkel et al.	
	130	US-5,665,262	09-09-1997	Hajaligol et al.	
	131	US-5,666,977	09-16-1997	Higgins et al.	
	132	US-5,666,978	09-16-1997	Counts et al.	

Examiner Signature		Date Considered	

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U. S. PATENT DOCUMENTS					
	133	US-5,687,746	11-18-1997	Rose et al.	
	134	US-5,692,525	12-02-1997	Counts et al.	
	135	US-5,715,844	02-10-1998	Young et al.	
	136	US-5,726,421	03-10-1998	Fleischhauer et al.	
	137	US-5,727,571	03-17-1998	Meiring et al.	
	138	US-5,743,251	04-28-1998	Howell et al.	
	139	US-5,778,899	07-14-1998	Saito et al.	
	140	US-5,799,663	09-01-1998	Gross et al.	
	141	US-5,819,751	10-13-1998	Barnes et al.	
	142	US-5,819,756	10-13-1998	Mielordt	
	143	US-5,829,453	11-03-1998	White et al.	
	144	US-5,865,185	02-02-1999	Collins et al.	
	145	US-5,865,186	02-02-1999	Volsey, II	
	146	US-5,878,752	03-09-1999	Adams et al.	
	147	US-5,880,439	03-09-1999	Deevi et al.	
	148	US-5,894,841	04-20-1999	Voges	
	149	US-5,915,387	06-29-1999	Baggett, Jr., et al.	
	150	US-5,934,289	08-10-1999	Watkins et al.	
	151	US-5,954,979	09-21-1999	Counts et al.	
	152	US-5,967,148	10-19-1999	Harris et al.	
	153	US-6,033,623	03-07-2000	Deevi et al.	
	154	US-6,040,560	03-21-2000	Fleischhauer et al.	
	155	US-6,053,176	04-25-2000	Adams et al.	
	156	US-6,089,857	07-18-2000	Matsuura et al.	
	157	US-6,095,152	08-01-2000	Beven et al.	
	158	US-6,095,153	08-01-2000	Kessler et al.	
	159	US-6,125,853	10-03-2000	Susa et al.	

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				Examiner Name	*To Be Assigned*
Sheet	7	of	13	Attorney Docket Number	**R60999 1400US.C5 (1777.4)**

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Examiner Signature		Date Considered	

*Examiner: Initial if reference 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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INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Complete if Known	
				Application Number	*To Be Assigned*
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				First Named Inventor	John Howard Robinson
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				Examiner Name	*To Be Assigned*
Sheet	8	of	13	Attorney Docket Number	**R60999 1400US.C5 (1777.4)**

U. S. PATENT DOCUMENTS					
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Complete if Known	
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				First Named Inventor	John Howard Robinson
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Sheet	9	of	13	Attorney Docket Number	**R60999 1400US.C5 (1777.4)**

U. S. PATENT DOCUMENTS					
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U. S. PATENT DOCUMENTS					
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				Examiner Name	*To Be Assigned*
Sheet	11	of	13	Attorney Docket Number	**R60999 1400US.C5 (1777.4)**

U. S. PATENT DOCUMENTS					
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Examiner Signature		Date Considered	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Complete if Known	
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				First Named Inventor	John Howard Robinson
				Art Unit	*To Be Assigned*
				Examiner Name	*To Be Assigned*
Sheet	12	of	13	Attorney Docket Number	**R60999 1400US.C5 (1777.4)**

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.	Foreign Patent Document Country Code - Number Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	English Language Translation Attached
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	296	GB 2 070 409	09-09-1981	British-American Tobacco Company, Limited		
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	308	CN 1541577	11-03-2004	HAN, Li		
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Examiner Signature		Date Considered	

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				Examiner Name	*To Be Assigned*
Sheet	13	of	13	Attorney Docket Number	**R60999 1400US.C5 (1777.4)**

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	310	CN 2719043	08-24-2005	HAN, Li		
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OTHER DOCUMENTS			
Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s) , volume-issue number(s), publisher, city and/or country where published.	English Language Translation Attached
	315	LU, ZHANG, "Safe Substitute", China Daily, July 11, 2005.	
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Examiner Signature	/PHU H NGUYEN/	Date Considered	12/12/2018

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Page 476

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Shari Elofson	(Typed or printed name)
	(Signature)
Filed Via EFS-Web January 11, 2019	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/879,268	01/24/2018	John Howard Robinson	R60999 1400US.C5 (1777.4)	9513

TITLE OF INVENTION: TOBACCO-CONTAINING SMOKING ARTICLE

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0.00	$0.00	$1000	02/07/2019

EXAMINER	ART UNIT	CLASS-SUBCLASS
NGUYEN, PHU HOANG	1747	131-200000

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.

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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 Womble Bond Dickinson (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 must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: RAI Strategic Holdings, Inc.

(B) RESIDENCE: (CITY and STATE OR COUNTRY): Winston-Salem, North Carolina

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. Fees submitted: ☒ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

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5. **Change in Entity Status** (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
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NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /lauren f. anderson/ Date January 11, 2019

Typed or printed name Lauren F. Anderson Registration No. 69,344

PTOL-85 Part B (08-18) Approved for use through 01/31/2020 OMB 0651-0033 U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

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	(Signature)
Filed Via EFS-Web January 11, 2019	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/879,268	01/24/2018	John Howard Robinson	R60999 1400US.C5 (1777.4)	9513

TITLE OF INVENTION: TOBACCO-CONTAINING SMOKING ARTICLE

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0.00	$0.00	$1000	02/07/2019

EXAMINER	ART UNIT	CLASS-SUBCLASS
NGUYEN, PHU HOANG	1747	131-200000

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 03-09 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 Womble Bond Dickinson (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 must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: RAI Strategic Holdings, Inc.

(B) RESIDENCE: (CITY and STATE OR COUNTRY): Winston-Salem, North Carolina

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. Fees submitted: ☒ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

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☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. 09-0528

5. **Change in Entity Status** (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /lauren f. anderson/ Date January 11, 2019

Typed or printed name Lauren F. Anderson Registration No. 69,344

RAI Exhibit 2008
Ecto World v. RAI
PGR2024-00049
Page 479

Electronic Patent Application Fee Transmittal

Application Number:	15879268
Filing Date:	24-Jan-2018
Title of Invention:	TOBACCO-CONTAINING SMOKING ARTICLE
First Named Inventor/Applicant Name:	John Howard Robinson
Filer:	Lauren F Anderson
Attorney Docket Number:	R60999 1400US.C5 (1777.4)

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

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	1501	1	1000	1000

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**1000**

Electronic Acknowledgement Receipt

EFS ID:	34833022
Application Number:	15879268
International Application Number:	
Confirmation Number:	9513
Title of Invention:	TOBACCO-CONTAINING SMOKING ARTICLE
First Named Inventor/Applicant Name:	John Howard Robinson
Customer Number:	26158
Filer:	Lauren F Anderson
Filer Authorized By:	
Attorney Docket Number:	R60999 1400US.C5 (1777.4)
Receipt Date:	11-JAN-2019
Filing Date:	24-JAN-2018
Time Stamp:	15:41:55
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	Issue Fee Payment (PTO-85B)	R60999_1400US_C5_1777_4_Issue_Fee.pdf	222492 f81d3a6363c091776cb754316113a69b46d17169	no	1

Warnings:

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Ecto World v. RAI
PGR2024-00049
Page 482

Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30400 8574ce9915422db3f06ef4fbf32a8a9f459ac231	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	252892		

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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.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (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.

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26158 7590 11/07/2018
WOMBLE BOND DICKINSON (US) LLP
ATTN: IP DOCKETING
P.O. BOX 7037
ATLANTA, GA 30357-0037

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 transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

Shari Elofson	(Typed or printed name)
	(Signature)
Filed Via EFS-Web January 11, 2019	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/879,268	01/24/2018	John Howard Robinson	R60999 1400US.C5 (1777.4)	9513

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Authorized Signature /lauren f. anderson/ Date January 11, 2019

Typed or printed name Lauren F. Anderson Registration No. 69,344

RAI Exhibit 2008
Ecto World v. RAI
PGR2024-00049
Page 484

Electronic Patent Application Fee Transmittal

Application Number:	15879268
Filing Date:	24-Jan-2018
Title of Invention:	TOBACCO-CONTAINING SMOKING ARTICLE
First Named Inventor/Applicant Name:	John Howard Robinson
Filer:	Lauren F Anderson/Shari Elofson
Attorney Docket Number:	R60999 1400US.C5 (1777.4)

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
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UTILITY APPL ISSUE FEE	1501	1	1000	1000

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**1000**

Electronic Acknowledgement Receipt

EFS ID:	34834563
Application Number:	15879268
International Application Number:	
Confirmation Number:	9513
Title of Invention:	TOBACCO-CONTAINING SMOKING ARTICLE
First Named Inventor/Applicant Name:	John Howard Robinson
Customer Number:	26158
Filer:	Lauren F Anderson/Shari Elofson
Filer Authorized By:	Lauren F Anderson
Attorney Docket Number:	R60999 1400US.C5 (1777.4)
Receipt Date:	11-JAN-2019
Filing Date:	24-JAN-2018
Time Stamp:	15:59:54
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$1000
RAM confirmation Number	011419INTEFSW00002735090528
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

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)	R60999_1400US_C5_1777_4_Issue_Fee.pdf	222492 f81d3a6363c091776cb754316113a69b46d17169	no	1
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30499 5968c05850b716c9dffed41dcbe411721a876e6d	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	252991		

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Complete if Known	
				Application Number	15/879,268
				Filing Date	January 24, 2018
				First Named Inventor	John Howard Robinson
				Art Unit	1747
				Examiner Name	Phu Hoang Nguyen
Sheet	1	of	6	Attorney Docket Number	**R60999 1400US.C5 (1777.4)**

U. S. PATENT DOCUMENTS					
Examiner Initials*	Cite No.	Document Number Number - Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages of Relevant Figures Appear
	319	US-438,310	10/14/1890	Edison	
	320	US-705,919	7/29/1902	Gill	
	321	US-780,087	1/17/1905	Burt	
	322	US-1,016,844	2/06/1912	Moonelis	
	323	US-1,084,304	1/13/1914	Vaughn	
	324	US-1,147,416	7/20/1915	MacDonald	
	325	US-1,347,631	7/27/1920	Jean	
	326	US-1,446,087	2/20/1923	Griffin	
	327	US-1,517,584	12/2/1924	Reece	
	328	US-1,879,128	9/27/1932	Despe	
	329	US-2,032,695	3/03/1936	Gimera	
	330	US-2,086,192	7/06/1937	Schumaker	
	331	US-2,140,516	12/20/1938	Cowan	
	332	US-2,461,664	2/15/1949	Smith	
	333	US-2,472,282	6/07/1949	Burchett	
	334	US-2,545,851	3/20/1951	Kardos	
	335	US-2,959,664	11/8/1960	Fenn	
	336	US-3,060,429	10/23/1962	Winston	
Change(s) applied to document /J.M./ 12/4/2018	337	US-3,281,637	10/1966 ~~9/23/1963~~	Hultquist	
	338	US-3,203,025	8/31/1965	Schreur	
	339	US-3,234,357	2/8/1966	Seuthe	
	340	US-3,292,635	12/20/1966	Kolodny	
	341	US-3,385,303	5/28/1968	Hind	
	342	US-3,428,053	2/18/1969	Schoenbaum	
	343	US-3,431,393	3/4/1969	Katsuda	

Examiner Signature		Date Considered	

*Examiner: Initial if reference 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.

ELECTRONICALLY FILED USING THE EFS-WEB ELECTRONIC FILING SYSTEM OF THE UNITED STATES PATENT AND TRADEMARK OFFICE ON AUGUST 30, 2018.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /P.H.N/

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Ecto World v. RAI
PGR2024-00049
Page 489

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.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/879,268	03/19/2019	10231488	R60999 1400US.C5 (1777.4)	9513

26158 7590 02/27/2019

WOMBLE BOND DICKINSON (US) LLP
ATTN: IP DOCKETING
P.O. BOX 7037
ATLANTA, GA 30357-0037

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 0 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):

John Howard Robinson, Kernersville, NC;
RAI Strategic Holdings, Inc., Winston-Salem, NC;
David William Griffith JR., Winston-Salem, NC;
Billy Tyrone Conner, Clemmons, NC;
Evon Llewellyn Crooks, Mocksville, NC;
Dempsey Bailey Brewer JR., East Bend, NC;

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RAI Exhibit 2008
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