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(54) ELECTRONIC CIGARETTE CONTROL METHOD AND APPARATUS

(57) An electronic cigarette control method and apparatus relating to the technical field of simulated smoking. The housing of the electronic cigarette is integrated with a pressure sensor. The method comprises: obtaining the pressure data detected by a pressure sensor (S110); when the pressure data exceeds a predetermined threshold, determining, according to the pressure data, the working parameters of an atomizer, and controls the atomizer so that the atomization process is performed in accordance with the working parameters, the working parameters comprising at least one of a working voltage, a working current, an output power and the temperature in an atomization cavity (S120). The method solves the problem in the related art of low playability of electronic cigarettes and the lack of fun when using them, and achieves the effect of enhancing the playability of electronic cigarettes.

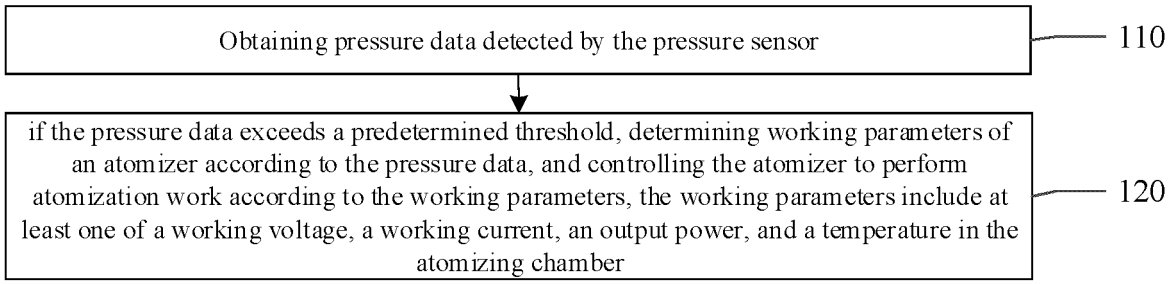

FIG. 1

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Description

TECHNICAL FIELD

[0001] The disclosure relates to the technical field of simulated smoking, in particular to an electronic cigarette control method and apparatus.

BACKGROUND

[0002] As a substitute for cigarettes, electronic cigarettes are becoming more and more popular in the market because of their safety, convenience and environmental protection to a certain extent.

[0003] However, the electronic cigarettes currently on the market usually only have the function of atomizing aerosol-forming substrate to generate smoke for users to use, which lacks playability and interest, and is boring and odorous when users use it.

SUMMARY

[0004] In order to solve the problem that the electronic cigarette lacks interest in the prior art, the embodiments of the present disclosure provide a control method and apparatus for the electronic cigarette. The technical solution is as follows:

[0005] In a first aspect, a control method of an electronic cigarette is provided, wherein a pressure sensor is integrated on the housing of the electronic cigarette, and the method includes:

obtaining pressure data detected by the pressure sensor;
if the pressure data exceeds a predetermined threshold, determining the working parameters of an atomizer according to the pressure data, and controlling the atomizer to perform atomization work according to the working parameters, the working parameters including at least one of a working voltage, a working current, an output power, and a temperature in the atomizing chamber.

[0006] Alternatively, the housing is provided with a holding and lighting enable switch, before obtaining pressure data detected by the pressure sensor, the method further includes:

obtaining an operation signal generated when the holding and lighting enable switch is operated;
if the operation signal is an activation signal of the holding and lighting function, starting the holding and lighting function of the electronic cigarette;
the electronic cigarette with holding and lighting function activated executes the step of obtaining the pressure data detected by the pressure sensor.

[0007] Alternatively, after obtaining an operation signal generated when the holding and lighting enable switch is operated, the method further includes:

if the operation signal is an activation signal of the holding and lighting function, closing the holding and lighting function of the electronic cigarette;
if the electronic cigarette with holding and lighting function detects a lighting signal, controlling the atomizer to perform atomization work according to the working parameters.

[0008] Alternatively, determining the working parameters of the atomizer according to the pressure data, including:
if the pressure data is lower than the preset upper limit value, the working parameters of the atomizer are determined according to a predetermined formula, the predetermined formula is:

$$W = \frac{(F - fmin)}{(fmax - fmin)} \times Ws$$

[0009] Wherein, *W* is the working parameter of the atomizer, F is the pressure data, *fmin* is a predetermined threshold, *fmax* is the preset upper limit value, *Ws* is an upper limit value of a working parameter or the set working parameter, and the preset upper limit value is greater than the predetermined threshold;

[0010] If the pressure data reaches the preset upper limit value, controlling the atomizer\to perform atomization work according to the set working parameters or the preset upper limit value.

[0011] Alternatively, an increase button and a decrease button are provided on the electronic cigarette, , and the method further includes: when detecting the increase signal generated when the increase button is operated, increasing the set working parameters; when detecting the decrease signal generated when the decrease button is operated, decreasing the set working parameter.

[0012] Alternatively, after obtaining the pressure data detected by the pressure sensor, the method further includes:
if the pressure data detected by the pressure sensor continues to be lower than the predetermined threshold for a duration that reaches a preset duration, displaying a first prompt information or a first prompt animation for prompting that the cigarette can be lit by holding it firmly.

[0013] Alternatively, after obtaining the pressure data detected by the pressure sensor, the method further includes:

determine the hand fatigue index according to the pressure data detected by the pressure sensor;
when the hand fatigue index reaches a limit threshold, displaying a second prompt information or a second prompt animation for prompting to stop the suc-

tion and relax the hand.

[0014] Alternatively, a switch is provided on the housing, wherein:

when the switch is turned on, the working parameters of the atomizer are positively correlated with the pressure data detected by the pressure sensor, when the switch is turned off, the working parameters of the atomizer are negatively correlated with the pressure data detected by the pressure sensor;
or, when the switch is turned off, the working parameters of the atomizer are positively correlated with the pressure data detected by the pressure sensor; when the switch is turned on, the working parameters of the atomizer are negatively correlated with the pressure data detected by the pressure sensor.

[0015] In a second aspect, a computer-readable storage medium is provided, one or more instructions are stored in the computer-readable storage medium, characterized in that: when the one or more instructions are executed by the processor in the electronic cigarette, the electronic cigarette control method according to the first aspect or any optional embodiment of the first aspect is implemented.

[0016] In a third aspect, a control apparatus for an electronic cigarette is provided, and the control apparatus includes:

a memory and a processor;
at least one program instruction is stored in the memory;
the processor, by loading and executing the at least one program instruction, implements the electronic cigarette control method according to the first aspect or any optional implementation manner of the first aspect.

[0017] The beneficial effects brought by the technical solutions provided in the embodiments of the present disclosure are:
the method provided by the embodiment of the present disclosure obtains the pressure data detected by the pressure sensor; when the pressure data exceeds the predetermined threshold, the working parameters of the atomizer are determined according to the pressure data, and the atomizer is controlled to perform atomization work according to the working parameters, the working parameter includes at least one of working voltage, working current, output power, and temperature in the atomizing chamber; the electronic cigarette user can control the electronic cigarette to light the cigarette by changing the pressure of pressing the pressure sensor, and the working parameters of the atomizer can be adjusted by changing the force to adjust the amount of smoke, which increases the playability of the electronic cigarette. It solves the problems of playability and dull use of electronic cigarettes in related technologies, and achieves the effect of improving the playability of electronic cigarettes.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] In order to illustrate the technical solutions in the embodiments of the present disclosure more clearly, the following briefly introduces the accompanying drawings used in the description of the embodiments. Obviously, the accompanying drawings in the following description are only some embodiments of the present disclosure. For those of ordinary skill in the art, other drawings can also be obtained from these drawings without creative effort.

FIG. 1 is a method flowchart of a control method of an electronic cigarette provided by an embodiment of the present disclosure;
FIG. 2 is a schematic diagram of circuit connections inside an electronic cigarette provided by an embodiment of the present disclosure;
FIG. 3 is a schematic diagram of a workflow of an electronic cigarette provided by an embodiment of the present disclosure.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0019] In order to make the objectives, technical solutions and advantages of the present disclosure clearer, the embodiments of the present disclosure will be further described in detail below with reference to the accompanying drawings.

[0020] Please refer to FIG. 1 to FIG. 3, which show a method flowchart of a control method for an electronic cigarette provided by an embodiment of the present disclosure. As shown in Figure 1, the control method of the electronic cigarette may include:
Step 110: obtaining pressure data detected by the pressure sensor.

[0021] Among them, the pressure sensor is integrated on the housing of the electronic cigarette, this application does not specifically limit the shape and size of the pressure sensor, for example, the pressure sensitive element of the pressure sensor can be the size of a fingernail and can be arranged on the part of the electronic cigarette housing that is often held when lighting a cigarette; for another example, the shape and size of the pressure sensitive element of the pressure sensor can be similar or the same as the housing of the electronic cigarette, the pressure sensitive element of the pressure sensor is covered on the housing of the electronic cigarette.

[0022] Step 120, if the pressure data exceeds a predetermined threshold, determining working parameters of an atomizer according to the pressure data, and controlling the atomizer to perform atomization work according to the working parameters, the working parameters

include at least one of a working voltage, a working current, an output power, and a temperature in the atomizing chamber.

[0023] Among them, the predetermined threshold can be set by the developer, or can be customized by the user, for example, developers can test the pressure data detected by the pressure sensor when the electronic cigarette is held but not exerted force through many experiments, determining the predetermined threshold according to the tested pressure data, for example, the average value of the tested pressure data is calculated as the predetermined threshold.

[0024] Alternatively, determining the working parameters of the atomizer according to the pressure data can be achieved in the following ways:

First, if the pressure data is lower than the preset upper limit value, then determining the working parameters of the atomizer according to the predetermined formula, and the predetermined formula is:

$$W = \frac{(F - fmin)}{(fmax - fmin)} \times Ws$$

[0025] Wherein, *W* is the working parameter of the atomizer, F is the pressure data, *fmin* is a predetermined threshold, *fmax* is the preset upper limit value, *Ws* is the upper limit value of the working parameter; If the pressure data detected by the pressure sensor reaches the preset upper limit value, the atomizer is controlled to perform atomization work according to the preset upper limit value. wherein, the preset upper limit value can be set by the developer or customized by the user. For example, developers can set a preset upper limit value according to the upper limit value of the pressure data detection range of the pressure sensor. For example, the upper limit value of the pressure data detection range of the pressure sensor is set as the preset upper limit value. For example, the preset upper limit is set to be slightly smaller than the upper limit of the pressure data detection range of the pressure sensor, or the preset upper limit can be determined according to the average grip strength of adults. For example, setting the average grip strength of adults as a preset upper limit. The upper limit value of the working parameter involved in this application can be the upper limit value of the working parameter supported by the atomizer, for example, it can be the maximum output power of the electronic cigarette, and it can also be the highest temperature that can be reached in the atomizing chamber when the atomizer is working. The upper limit value of the working parameter involved in this application can also be a user-defined value.

[0026] Second, if the pressure data is lower than the preset upper limit, the working parameters of the atomizer are determined according to a predetermined formula, and the predetermined formula is:

$$W = \frac{(F - fmin)}{(fmax - fmin)} \times Ws$$

; wherein, *W* is the working parameter of the atomizer, F is the above-mentioned pressure data, *fmin* is the predetermined threshold value, *fmax* is the preset upper limit value, *Ws* is the upper limit value of the working parameter; if the pressure data detected by the pressure sensor reaches the preset upper limit value, the atomizer is controlled to perform atomization work according to the upper limit value of the working parameter.

[0027] Alternatively, an increase button and a decrease button are provided on the electronic cigarette, when detecting the increase signal generated when the increase button is operated, increase the set working parameters; when the decrease signal generated when the decrease button is operated is detected, the set working parameter is decreased. In actual implementation, each time a new increase signal is detected, the set working parameters are increased by a predetermined step; each time a new reduction signal is detected, the set operating parameters are decreased by a predetermined step size. Wherein, the predetermined step size can be set by the developer, or can be defined by the user. For example, when the working parameter is the output power, the predetermined step size can be set as 2W.

[0028] Alternatively, when the pressure data detected by the pressure sensor is lower than a predetermined threshold, or, when the pressure data detected by the pressure sensor continues to be lower than the predetermined threshold for a duration that reaches a preset duration, then, the first prompt information or the first prompt animation for prompting that the cigarette can be lit by holding it firmly is displayed. The first prompt information may be prompted by means of text prompts, voice prompts, vibration prompts, buzzer prompts, etc.; the preset duration is usually set by the developer, for example, the preset duration can be 5 seconds.

[0029] Third, multiple gripping force ranges are stored in the electronic cigarette, each grip force range corresponds to a reference coefficient, the plurality of grip force ranges do not overlap; the electronic cigarette can obtain the grip force range where the pressure data is located, obtain the reference coefficient corresponding to the grip force range, and calculate the product of the reference coefficient and the pressure data as the working parameter of the atomizer. Among them, the upper limit value of different gripping force ranges is positively correlated or negatively correlated with the reference coefficient.

[0030] For example, the predetermined threshold is 1 Newton, the multiple grip force ranges stored in the electronic cigarette include (1N, 3N], (3N, 5N]. The corresponding coefficient of (1N, 3N] is 5W/N, the corresponding coefficient of (3N, 5N] can be 10 W/N. When the pressure data detected by the pressure sensor is 3N, the electronic cigarette can determine that the working parameter of the atomizer is 15W, and control the atomizer

in the electronic cigarette to output according to 15W.

[0031] This application only schematically illustrates the realization of determining the working parameters of the atomizer according to the pressure data in the above three ways, in actual implementation, it can also be implemented in other manners, which will not be repeated here.

[0032] To sum up, the method provided by the embodiment of the present disclosure obtains the pressure data detected by the pressure sensor; when the pressure data exceeds the predetermined threshold, the working parameters of the atomizer are determined according to the pressure data, and the atomizer is controlled to perform atomization work according to the working parameters, the working parameter includes at least one of working voltage, working current, output power, and temperature in the atomizing chamber; the electronic cigarette user can control the electronic cigarette to light the cigarette by changing the pressure of pressing the pressure sensor, and the working parameters of the atomizer can be adjusted by changing the force to adjust the amount of smoke, which increases the playability of the electronic cigarette. It solves the problems of playability and dull use of electronic cigarettes in related technologies, and achieves the effect of improving the playability of electronic cigarettes.

[0033] Alternatively, the housing is provided with a holding and lighting enable switch, the holding and lighting enable switch can be a mechanical button, a toggle switch, a touch panel, etc. The user can activate or deactivate the holding cigarette lighting function by operating the holding and lighting enable switch. Among them, the electronic cigarette that starts the function of holding the cigarette can perform the steps shown in FIG. 1, control the atomization work of the electronic cigarette according to the detected holding force (that is, the pressure data detected by the pressure sensor), so that the electronic cigarette user can operate the electronic cigarette to perform the atomization work by changing the holding force; an electronic cigarette with the function of holding the cigarette lighter is turned off, and the electronic cigarette cannot be operated by changing the holding force for atomization.

[0034] Specifically, acquiring the operation signal generated when the holding and lighting enable switch is operated; If the operation signal is the starting signal of the holding and lighting function, the holding and lighting function of the electronic cigarette is started; the electronic cigarette with the activated holding and lighting enable function executes step 110.

[0035] Take the holding and lighting enable switch as the toggle switch for illustration, when it is detected that the toggle switch is turned off, the holding and lighting function of the electronic cigarette is activated, and step 110 is executed; when it is detected that the toggle switch is turned on, the holding and lighting function of the electronic cigarette is turned off. Alternatively, the toggle switch is marked with a toggle direction for enabling the holding and lighting function of the electronic cigarette.

[0036] Alternatively, if the operation signal is a signal for turning off the holding and lighting function, the holding and lighting function of the electronic cigarette is turned off; if the lighting signal of an electronic cigarette with the cigarette lighting function turned off is detected, the atomizer will be controlled to perform atomization according to the set working parameters. For example, an electronic cigarette with the cigarette lighting function turned off, electronic cigarette users can light the cigarette by operating the cigarette light button or pulling hard to trigger the atomizer in the electronic cigarette for atomization. During the working process of the atomizer, the atomization work is carried out according to the set working parameters. Among them, the set working parameters can be customized and adjusted by the user, for example, electronic cigarette users can adjust and set working parameters by operating the increase button and the decrease button on the electronic cigarette.

[0037] In this application, when exemplifying the specific implementation of determining the working parameters of the atomizer according to the pressure data, the working parameters of the atomizer are positively correlated with the pressure data for illustration. In actual implementation, the user of the electronic cigarette can operate the electronic cigarette to select whether the working parameters of the atomizer are positively correlated or negatively correlated with the pressure data. Specifically, the housing is provided with a switch, wherein: when the switch is turned on, the working parameters of the atomizer are positively correlated with the pressure data detected by the pressure sensor, when the switch is turned off, the working parameters of the atomizer are negatively correlated with the pressure data detected by the pressure sensor; or, when the switch is turned off, the working parameters of the atomizer are positively correlated with the pressure data detected by the pressure sensor; the working parameters of the nebulizer when the toggle switch is on is negatively correlated with the pressure data detected by the pressure sensor.

[0038] Wherein, when the working parameter of the atomizer is positively correlated with the pressure data detected by the pressure sensor, it can be realized by referring to any one of the methods in step 120, which will not be repeated here. When the working parameters of the atomizer are negatively correlated with the pressure data detected by the pressure sensor, the relationship between the working parameters of the atomizer and the pressure data detected by the pressure sensor can be:

$$W = Ws - \frac{(F - fmin)}{(fmax - fmin)} \times Ws$$

wherein, *W* is the working parameter of the atomizer, F is the above-mentioned pressure data, *fmin* is the predetermined threshold, *fmax* is the preset upper limit, and

Ws is the upper limit of the working parameter; if the pressure data detected by the pressure sensor reaches the preset upper limit value, the atomizer is controlled to perform atomization work according to the upper limit value of the working parameters; of course, when the working parameters of the atomizer are negatively correlated with the pressure data detected by the pressure sensor, the working parameters of the atomizer can also be determined according to the pressure data detected by the pressure sensor in other ways, which will not be repeated here.

[0039] Alternatively, holding for a long time or high-frequency force will cause hand fatigue and damage; in order to avoid hand fatigue, the electronic cigarette also determines the hand fatigue index according to the pressure data detected by the pressure sensor; when the hand fatigue index reaches the limit threshold, the second prompt information or the second prompt animation prompting to stop smoking and relax the hand is displayed, and/or the holding and lighting function of the electronic cigarette is turned off. The second prompt information may be prompted by any one of text prompts, voice prompts, vibration prompts, buzzer prompts, etc., which is not specifically limited in this embodiment.

[0040] Among them, determining the hand fatigue index according to the pressure data detected by the pressure sensor can be realized in the following ways:

the first is to count the duration that the pressure data detected by the pressure sensor continues to reach the preset upper limit value as the hand fatigue index. For example, the limit threshold is 5 seconds, when the pressure data detected by the pressure sensor continuously reaches the preset upper limit value for a duration of 5 seconds, the prompt information for prompting the relaxation animation starts to be displayed, or the vibration of the electronic cigarette is controlled.

the second is to obtain the number of times that the pressure sensor is used to light cigarettes in the current statistical period, as the hand fatigue index. That is, the number of times that the pressure data detected by the pressure sensor reaches a predetermined threshold to trigger the atomizer to start atomization. For example, the limit threshold is 50 times, and the statistical period is 1 day. When it is detected that the number of times of using the pressure sensor to light a cigarette reaches 50 times in a day, the holding and lighting function of the electronic cigarette is turned off, and a second prompt message for prompting to stop smoking and relax the hand is displayed.

[0041] An embodiment of the present disclosure further provides a computer-readable storage medium, one or more instructions are stored in the computer-readable storage medium, when the one or more instructions are run on the electronic cigarette, the electronic cigarette control method involved in any of the above embodiments is executed.

[0042] An embodiment of the present disclosure also provides a computer program product, when the computer program product runs on the electronic cigarette, the electronic cigarette is made to execute the relevant steps involved in any of the above embodiments, so as to realize the control method of the electronic cigarette in any of the above-mentioned embodiments.

[0043] An embodiment of the present disclosure also provides a control apparatus for an electronic cigarette, the control apparatus may specifically be a chip, a component or a module, the control apparatus includes an associated memory and a processor; wherein the memory is used to store at least one instruction, when the control apparatus is running, the processor may load and execute the at least one instruction, so as to implement the control method of the electronic cigarette involved in any of the foregoing embodiments.

[0044] The terms "first" and "second" are used for descriptive purposes only, and should not be understood as indicating or implying relative importance or implying the indicated number of technical features. Thus, a feature defined as "first", "second" may expressly or implicitly include one or more of that features. In the description of the present disclosure, unless otherwise specified, "plurality" means two or more.

[0045] Those of ordinary skill in the art can understand that all or part of the steps of implementing the above embodiments can be completed by hardware, it can also be completed by instructing the relevant hardware through the program; the described program can be stored in a computer-readable storage medium, the above-mentioned storage medium may be a read-only memory, a magnetic disk or an optical disk, and the like.

[0046] The above descriptions are only preferred embodiments of the present disclosure, and are not intended to limit the present disclosure. Any modification, equivalent replacement, improvement, etc. made within the spirit and principle of the present disclosure shall be included within the protection scope of the present disclosure.

Claims

1. A control method of an electronic cigarette is provided, wherein a pressure sensor is integrated on the housing of the electronic cigarette, and the method comprising:

   obtaining pressure data detected by the pressure sensor;

   if the pressure data exceeds a predetermined threshold, determining working parameters of the atomizer according to the pressure data, and controlling the atomizer to perform atomization work according to the working parameters, the working parameters comprising at least one of a working voltage, a working current, an output power, and a temperature in the atomizing chamber.

2. The method according to claim **1,** wherein the housing is provided with a holding and lighting enable switch, before obtaining pressure data detected by the pressure sensor, the method further comprises:

   obtaining an operation signal generated when the holding and lighting enable switch is operated;
   if the operation signal is an activation signal of the holding and lighting function, starting the holding and lighting function of the electronic cigarette;
   the electronic cigarette with holding and lighting function activated executing the step of obtaining the pressure data detected by the pressure sensor.

3. The method according to claim **2,** wherein after obtaining an operation signal generated when the holding and lighting enable switch is operated, the method further comprises:

   if the operation signal is an deactivate signal of the holding and lighting function, closing the holding and lighting function of the electronic cigarette;
   if the electronic cigarette with holding and lighting function detects a lighting signal, controlling the atomizer to perform atomization work according to the working parameters.

4. The method according to claim **1,** wherein determining the working parameters of an atomizer according to the pressure data, comprising:

   if the pressure data is lower than a preset upper limit value, determining the working parameters of the atomizer according to a predetermined formula, the predetermined formula is:

$$W = \frac{(F - fmin)}{(fmax - fmin)} \times Ws$$

   Wherein, *W* is the working parameter of the atomizer, F is the pressure data, *fmin* is a predetermined threshold, *fmax* is the preset upper limit value, *Ws* is an upper limit value of the working parameter or the set working parameter, and the preset upper limit value is greater than the predetermined threshold;
   if the pressure data reaches the preset upper limit value, controlling the atomizer to perform atomization work according to the set working parameters or the preset upper limit value.

5. The method according to claim **3** or **4,** wherein an increase button and a decrease button are provided on the electronic cigarette, and the method further comprises:

   when detecting the increase signal generated when the increase button is operated, increasing the set working parameters;
   when detecting the decrease signal generated when the decrease button is operated, decreasing the set working parameter.

6. The method according to claim **1,** wherein after obtaining pressure data detected by the pressure sensor, the method further comprises:
   if the pressure data detected by the pressure sensor continues to be lower than the predetermined threshold for a duration that reaches a preset duration, displaying a first prompt information or a first prompt animation for prompting that the cigarette can be lit by holding it firmly.

7. The method according to claim **1,** wherein after obtaining the pressure data detected by the pressure sensor, the method further comprises:

   determine the hand fatigue index according to the pressure data detected by the pressure sensor;
   when the hand fatigue index reaches a limit threshold, displaying a second prompt information or a second prompt animation for prompting to stop the suction and relax the hand.

8. The method according to claim **1,** a switch is provided on the housing, wherein:

   when the switch is turned on, the working parameters of the atomizer are positively correlated with the pressure data detected by the pressure sensor, when the switch is turned off, the working parameters of the atomizer are negatively correlated with the pressure data detected by the pressure sensor;
   or, when the switch is turned off, the working parameters of the atomizer are positively correlated with the pressure data detected by the pressure sensor; when the switch is turned on, the working parameters of the atomizer are negatively correlated with the pressure data detected by the pressure sensor.

9. A computer-readable storage medium is provided, one or more instructions are stored in the computer-readable storage medium, **characterized in that**: when the one or more instructions are executed by the processor in the electronic cigarette, the electronic cigarette control method according to any one of claims **1** to **8** is implemented.

10. A control apparatus for an electronic cigarette comprising:

a memory and a processor;
at least one program instruction is stored in the memory;
the processor, by loading and executing the at least one program instruction, implements the electronic cigarette control method according to any one of claims **1** to **8.**

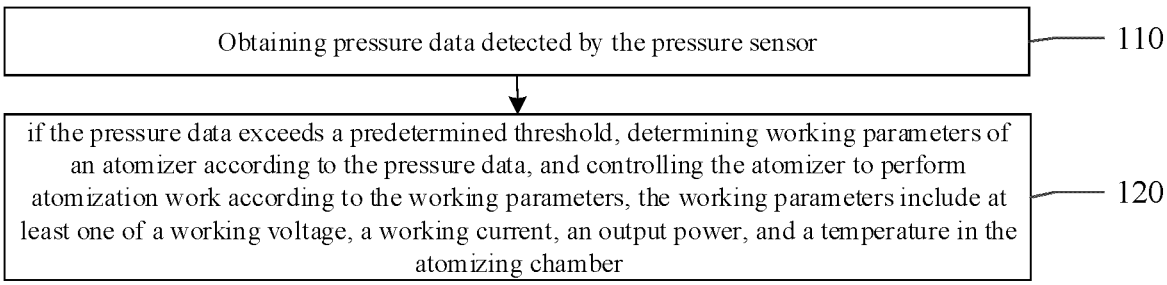
Obtaining pressure data detected by the pressure sensor
110
if the pressure data exceeds a predetermined threshold, determining working parameters of an atomizer according to the pressure data, and controlling the atomizer to perform atomization work according to the working parameters, the working parameters include at least one of a working voltage, a working current, an output power, and a temperature in the atomizing chamber
120

FIG. 1

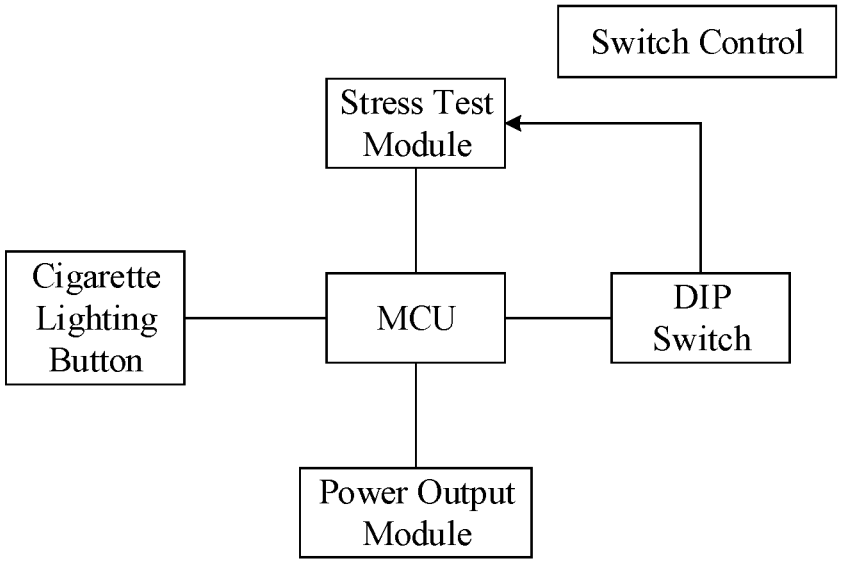
Switch Control
Stress Test Module
Cigarette Lighting Button
MCU
DIP Switch
Power Output Module

FIG. 2

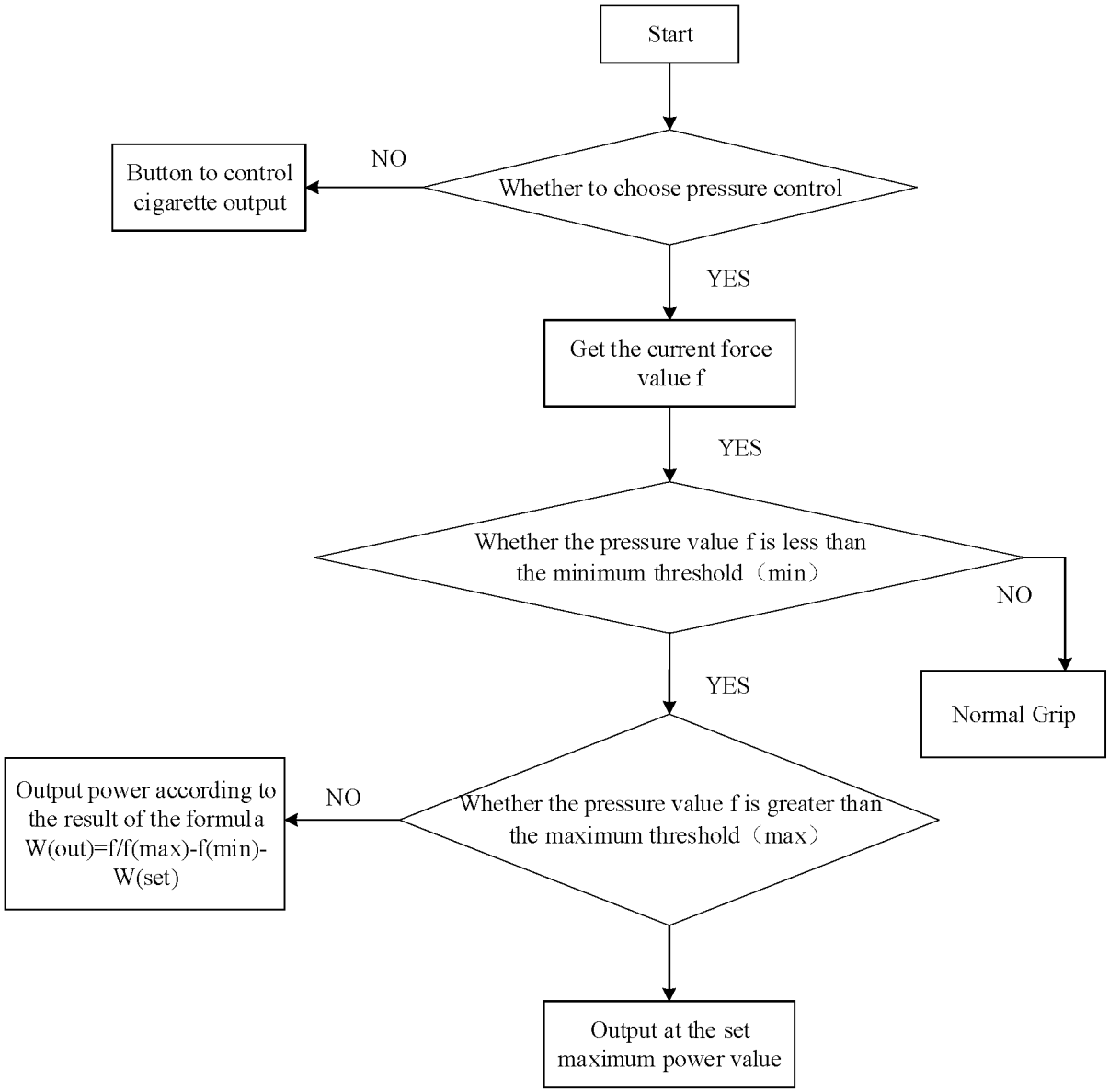
Start
Whether to choose pressure control
NO
Button to control cigarette output
YES
Get the current force value f
YES
Whether the pressure value f is less than the minimum threshold（min）
NO
Normal Grip
YES
Whether the pressure value f is greater than the maximum threshold（max）
NO
Output power according to the result of the formula W(out)=f/f(max)-f(min)-W(set)
Output at the set maximum power value

FIG. 3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2021/080244

A. CLASSIFICATION OF SUBJECT MATTER

A24F 40/10(2020.01)i

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)

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 practicable, search terms used)

CNPAT, CNKI, WPI, EPODOC: 常州市派腾电子, 压, 力, 按, 握, 持, 拿, 开启, 触发, 启动, 开关, 触控, 触摸, 感应, 传感, 改变, 变化, pressure, push+, grasp+, hold+, start+, turn on, switch+, touch+, sens+, chang+, adjust+

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 106037022 A (SHENZHEN SITUOWEI ELECTRONIC CO., LTD.) 26 October 2016 (2016-10-26) description, paragraphs [0004], [0014]	1-10
X	CN 209546924 U (SHENZHEN WEIBOLI TECHNOLOGY CO., LTD.) 29 October 2019 (2019-10-29) description, paragraphs [0005]-[0018]	1-10
A	CN 106413447 A (NURYAN HOLDINGS LTD,) 15 February 2017 (2017-02-15) entire document	1-10
A	CN 206963986 U (SHENZHEN KINGZONE TECHNOLOGY CO., LTD.) 06 February 2018 (2018-02-06) entire document	1-10
A	CN 110301681 A (SHENZHEN OUKE ELECTRONIC TECHNOLOGY CO., LTD.) 08 October 2019 (2019-10-08) entire document	1-10
A	CN 110613174 A (SHENZHEN JIER TECHNOLOGY CO., LTD.) 27 December 2019 (2019-12-27) entire document	1-10

☑ Further documents are listed in the continuation of Box C. ☑ See patent family annex.

* Special categories of cited documents:
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Date of the actual completion of the international search	Date of mailing of the international search report
20 May 2021	**09 June 2021**

Name and mailing address of the ISA/CN	Authorized officer
China National Intellectual Property Administration (ISA/CN) **No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088** **China**	
Facsimile No. **(86-10)62019451**	Telephone No.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2021/080244

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	KR 20190142594 A (EM TECH. CO., LTD.) 27 December 2019 (2019-12-27) entire document	1-10

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2021/080244

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