(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 3 747 287 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
09.12.2020 Bulletin 2020/50

(21) Application number: **20177730.7**

(22) Date of filing: **02.06.2020**

(51) Int Cl.:
A24F 40/50 *(2020.01)* ***A24F 40/60*** *(2020.01)*
A24F 40/53 *(2020.01)* ***A61M 15/06*** *(2006.01)*

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(30) Priority: **03.06.2019 CN 201910484144**

(71) Applicant: **Shenzhen IVPS Technology Co., Ltd.**
Shenzhen, Guangdong 518106 (CN)

(72) Inventor: **OUYANG, Junwei**
Shenzhen, Guangdong 518106 (CN)

(74) Representative: **IP-PAL Patent & Trademark Attorneys GmbH**
Obermattweg 12
6052 Hergiswil, Nidwalden (CH)

(54) A CONTROLLING METHOD FOR AN ELECTRONIC CIGARETTE, STORAGE MEDIUM, AND AN ELECTRONIC CIGARETTE CONTAINING THE SAME

(57) The present disclosure includes a control method for an electronic cigarette, a storage medium, and an electronic cigarette. The control method is applied to an electronic cigarette. The electronic cigarette includes a power supply device and an atomizing device wherein, the output end of power supply unit is detachably connected with the input end of atomizing device. The control method includes generating a prompt message when the output end of power supply device contacts with the input end of atomizing device and performing a corresponding prompt operation according to the generated prompt message. The present disclosure performs a prompt operation to prompt users when the output end of power supply device contacts with the input end of atomizing device, which is convenient for users to use the electronic cigarette in time.

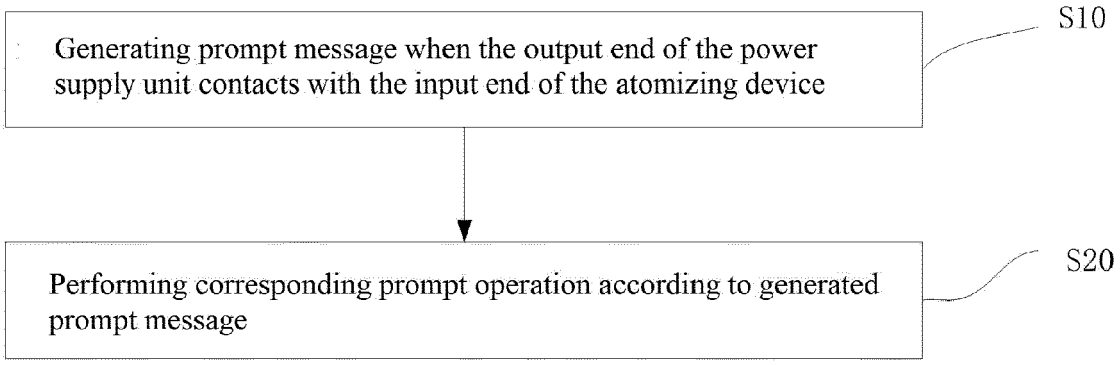

Fig. 1

EP 3 747 287 A1

Description

FIELD OF THE DISCLOSURE

[0001] The present disclosure is related to the field of electronic cigarettes, particularly a control method for an electronic cigarette, a storage medium and an electronic cigarette.

BACKGROUND OF THE DISCLOSURE

[0002] Electronic cigarettes in prior arts usually adopt a design that the atomizing device and the power supply device are separate; that is, the atomizing device is detachably connected to the power supply device, and the atomizing device will be installed on the power supply device to establish a electric connection only when it needs to be used. However, users will not be promptly notified when the atomizing device electrically contacts with the power supply device in prior art, causing inconvenience for users.

[0003] Therefore, the electronic cigarettes in prior arts need to be modified and improved.

SUMMARY OF THE DISCLOSURE

[0004] The technical problem to be solved by the present disclosure is to overcome disadvantages of prior arts by providing a control method for an electronic cigarette, a storage medium and an electronic cigarette, so as to solve the problem that the user cannot get prompt message in time when an electrical connection is established between the atomizing device and the power supply device.

[0005] The technical solution adopted by the present disclosure to solve the above technical problem is a control method for an electronic cigarette is applied to an electronic cigarette. The electronic cigarette includes a power supply device and an atomizing device wherein, the output end of power supply device is detachably connected with the input end of atomizing device. The control method includes generating prompt message when the output end of power supply device contacts with the input end of atomizing device, performing corresponding prompt operation according to the generated prompt message wherein the prompt operation includes at least either indicator flashing and/or vibration, when the output end of power supply device contact with the input end of atomizing device, the generated prompt message specifically includes obtaining information about current quantity of electricity when the output end of power supply device contacts with the input end of atomizing device, and generating corresponding prompt message according to the current quantity of electricity.

[0006] In some implementations, the control method for an electronic cigarette is characterized in that, when the output end of power supply device contacts with the input end of atomizing device, the obtaining information about the current quantity of electricity specifically includes obtaining the current voltage value when the output end of power supply device contacts with the input end of atomizing device, determining the current quantity of electricity according to the current voltage value, and deciding the range of electricity that the current quantity of electricity belongs to.

[0007] In some implementations, the control method for an electronic cigarette is characterized in that the generation of corresponding prompt message according to the current quantity of electricity specifically includes retrieving corresponding prompt parameters from a preset database according to the determined range of electricity, wherein, the prompt parameters include at least color of indicator, flashing duration, and vibration duration, generating a corresponding prompt message according to the retrieved prompt parameters.

[0008] In some implementations, the control method for an electronic cigarette further includes pre-establishing a corresponding relationship between the range of electricity and the prompt parameters, and saving the corresponding relationship in a preset database.

[0009] In some implementations, the control method for an electronic cigarette is characterized in that the performance of corresponding prompt operation according to the generated prompt message specifically includes obtaining prompt parameters corresponding to the prompt message, and using the obtained prompt parameters to perform the prompt operation.

[0010] In some implementations, the control method for an electronic cigarette further includes obtaining the current quantity of remained electricity when the output end of power supply device separates with the input end of atomizing device, and comparing the current quantity of remained electricity to the preset threshold of electricity.

[0011] In some implementations, when the current quantity of remaining electricity is lower than the threshold of electricity, performing the operation that prompts the user to charge.

[0012] In some implementations, a storage medium that stores multiple instructions, and the instructions are applicable to be loaded by a processor and perform the control method for an electronic cigarette as said in any of above implementations.

[0013] In some implementations, an electronic cigarette includes a processor, which is applicable to implement each instruction, and a storage medium, which is applicable to store multiple instructions, the instructions are applicable to be loaded by a processor and perform the control method for an electronic cigarette as said in any of above claims.

[0014] Beneficial effect: compared to the prior arts, the present disclosure discloses a control method for an electronic cigarette, a storage medium, and an electronic cigarette. The control method is applied to an electronic cigarette. The electronic cigarette includes a power supply device and an atomizing device; wherein, the output end

of power supply device is detachably connected with the input end of atomizing device. The control method includes generating a prompt message when the output end of power supply device contacts with the input end of atomizing device and performing a corresponding prompt operation according to the generated prompt message. The present disclosure will perform a prompt operation to prompt users when the output end of power supply device contacts with the input end of atomizing device, which is convenient for users to use the electronic cigarette in time.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015]

Fig. 1 is a flowchart for preferred embodiment of the control method for an electronic cigarette disclosed in the present disclosure.

Fig. 2 is a flowchart for specific embodiment of step S10 in the control method for an electronic cigarette disclosed in the present disclosure.

Fig. 3 is a flowchart for specific embodiment of step S12 in the control method for an electronic cigarette disclosed in the present disclosure.

Fig. 4 is a structural schematic of the electronic cigarette disclosed in the present disclosure.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

[0016] The present disclosure discloses a control method for an electronic cigarette, a storage medium, and an electronic cigarette. To make the objects, technical solutions, and advantages of the present disclosure clearer and more specific, the present disclosure will be further described in detail below with reference to the accompanying drawings and specific embodiments. It should be understood that the specific embodiments described herein are only used to explain the present disclosure, but not used to limit the present disclosure.

[0017] It is understood by those skilled in the art that, unless specifically stated, as used herein, the singular forms "a," "an," and "the" are intended to include the plural forms as well. It should be further understood that the term "include", "including", "comprise", or "comprising" used herein specifies the presence of stated features, numbers, steps, operations, elements, and/or components thereof but does not preclude the presence or addition of one or more other features, numbers, steps, operations, elements, components, and/or combinations thereof. It will be understood that, when an element is referred to as being "connected" or "coupled" to another element, it can be directly connected or coupled to the other element, or intervening elements may be present. Furthermore, "connected" or "coupled" as used herein may include wirelessly connected or coupled. As used herein, the term "and/or" includes any and all combinations of one or more of the associated listed items.

[0018] Unless otherwise defined, all terms (including technical and scientific terms) used herein have the same meaning as commonly understood by one of ordinary skill in the art, to which this disclosure belongs. It will be further understood that terms, such as those defined in commonly used dictionaries, should be interpreted as having a meaning that is consistent with their meaning in the context of the relevant art and the present disclosure, but will not be interpreted in an idealized or overly formal sense unless expressly so defined herein.

[0019] The disclosure is described more fully hereinafter with reference to the accompanying drawings and specific embodiments.

[0020] Please refer to Fig. 1. Fig. 1 is a flowchart for preferred embodiment of the control method for an electronic cigarette disclosed in the present disclosure. The control method is applied to an electronic cigarette; the electronic cigarette includes a power supply device and an atomizing device; wherein, the output end of power supply device is detachably connected with the input end of atomizing device, which includes:

S10, generating a prompt message when the output end of power supply device contacts with the input end of atomizing device;

S20, performing a corresponding prompt operation according to the generated prompt message.

[0021] The embodiment brings convenience to users through performing the prompt operation and prompting the user in time that the atomizing device has successfully established an electrical connection with the power supply device when the output end of power supply device contacts with the input end of atomizing device.

[0022] Specifically, in the step S10, the output end of power supply device refers to the output electrodes of power supply device, which include the positive output electrode and the negative output electrode. The input end of atomizing device refers to the input electrodes of atomizing device, which include the positive input electrode and the negative input electrode. When the positive output electrode contacts with the positive input electrode, and the negative output electrode contacts with the negative input electrode, a power supply circuit will be formed between the output end of power supply device and the input end of atomizing device, then the power supply device may deliver the electric power to the atomizing device. The prompt message carries a prompt mode and prompt parameters corresponding to the prompt operation, and the subsequent electronic cigarettes make corresponding prompts according to the prompt message. In this embodiment, the prompt operation includes at least either indicator flashing and/or vi-

bration. That is, in practical application, the prompt may be made by either flashing an indicator light, or by vibrating, or by both flashing and vibrating an indicator at the same time. It should be noted that the prompt method is not limited to the above examples; for example, voice prompting may also be adopted.

[0023] Furthermore, when the atomizer electrically contacts with the power supply device, in order to facilitate the user to obtain current electric quantity information of the power supply device, the information about the electricity of power supply device can also be obtained at the same time, then a targeted prompt is made according to the quantity of electricity to facilitate the user to act accordingly based on the quantity of electricity.

[0024] Exemplarily, as shown in Fig. 2, when the output end of the power supply device contact with the input end of the atomizing device, the generation of prompt message specifically includes:

S11, obtaining the information about current quantity of electricity when the output end of power supply device contacts with the input end of atomizing device; and

S12, generating the corresponding prompt message according to the current quantity of electricity.

[0025] Specifically, in the step S11, the information about the current quantity of electricity refers to the current remaining electricity of power source in the power supply device. In order to reduce the subsequent calculation by the electronic cigarette, this embodiment uses the range of electricity that the quantity of remaining electricity belongs to as its quantity of electricity and matches the corresponding prompt information.

[0026] Furthermore, the electricity information is obtained by obtaining the voltage values at both ends of the power source in this embodiment. The specific process includes: obtaining the current voltage value when the output end of power supply device contacts with the input end of atomizing device, determining the current quantity of electricity according to the current voltage value, and deciding the range of current electricity. Firstly, obtain the current voltage value at both ends of the power source, calculate the current quantity of electricity according to the obtained voltage value, then compare the current quantity of electricity to the preset threshold of electricity to determine the range of electricity that it belongs to. In this embodiment, three different thresholds of electricity forms four ranges of electricity, and the three thresholds of electricity are respectively recorded as the first threshold of electricity, the second threshold of electricity, and the third threshold of electricity; wherein, the first threshold of electricity, the second threshold of electricity, and the third threshold of electricity increase sequentially. Therefore, the four ranges of electricity are the first range of electricity(0, the first threshold of electricity), the second range of electricity (the first threshold of electricity, the second threshold of electricity), and the third range of electricity (the second threshold of electricity, the third threshold of electricity), and the fourth range of electricity (the third threshold of electricity, 100%),respectively. In practical application, the current quantity of electricity may be first compared to the second threshold of electricity; if the current quantity of electricity is greater than the second threshold of electricity the current threshold of electricity will be compared to the third threshold of electricity, until the range of electricity that it belongs to is determined. Similarly, if the current threshold of electricity is smaller than the second threshold of electricity, the current threshold of electricity will be compared to the first threshold of electricity, until the range of electricity that it belongs to is determined.

[0027] In the step S12, as shown in Fig.3, the generation of corresponding prompt message according to the current quantity of electricity specifically includes:

S121, retrieving the corresponding prompt parameters in a preset database according to the determined range of electricity; wherein, the prompt parameters include at least color of indicator, flashing parameter, and vibration parameter; and

S122, generating the corresponding prompt message according to the retrieved prompt parameters.

[0028] In the step S121, the corresponding relationship between the range of electricity and the prompt parameters is pre-stored in the preset database. Therefore, this embodiment further includes a process pre-generating the database:

S01, pre-establishing the corresponding relationship between the range of electricity and the prompt parameters, and saving the corresponding relationship in the preset database.

[0029] Specifically, the electronic cigarette receives the input operation from the user to establish the corresponding relationship between the range of electricity and the prompt parameters; wherein, the prompt parameters include at least either color of indicator and/or flashing parameters. The relationship between the quantity of electricity and the color of indicator is one-to-one correspondence. For example, four colors are set for indicators, which are respectively red, orange, blue, and green; wherein, red corresponds to the first range of electricity, orange corresponds to the second range of electricity, blue corresponds to the third range of electricity, and green corresponds to the fourth range of electricity. The flashing parameters may include flashing duration and flashing times; wherein, the flashing duration refers to the lighting duration of indicator, such as 0.5S, 1S. The flashing durations corresponding to each range of electricity may be the same or different. The flashing times may be one, two, or three lighting. For example, one flashing include 0.5S lighting, two flashing include lighting 0.5S and light off, then lighting 0.5S again and light off.

The combination of flashing duration and/or flashings times and the color corresponds to different range of electricity so as to distinguish different range of electricity, which is convenient for user to identify.

[0030] Furthermore, the electronic cigarette is also equipped with a vibration motor to prompt the user by vibration. Therefore, the prompt parameters also include vibration parameters. The vibration parameters refer to parameters of the vibration motor, such as vibration duration, vibration frequency, or intensity. For example, the corresponding relationship between the vibration duration and the range of electricity can be set, so that different quantity of electricity can correspond to different vibration duration; or, the corresponding relationship between the vibration intensity and the range of electricity also can be set to distinguish different quantity of electricity, for example, the vibration intensity gradually increases with the increasing quantity of electricity. In practical application, the three thresholds of electricity are respectively 25%, 50%, and 75%, then the four ranges of electricity are respectively the first range of electricity (0, 25%), the second range of electricity (25%, 50%), the third range of electricity (50%, 75%), and the fourth range of electricity (75%, 100%). Wherein, the first range of electricity (0, 25%) corresponds to the red indicator, flashing one time for 0.5S and vibrating 0.5S; the second range of electricity (25%, 50%) corresponds to the blue indicator, flashing one time for 0.5S and vibrating 1S, etc. When it is detected that the current quantity of electricity is 40%, it will be decided that it is in the second range of electricity, then the corresponding prompt parameters will include blue indicator, flashing one time for 1S, and vibrating 1S. In this way, when the user installs the atomizing device on the power supply device, at the moment that the atomizing device electrically contacts with the power supply device, it not only prompt the user that the atomizing device has been powered on and ready for use, but also inform the user about the quantity of electricity in the power supply device through the prompt parameters, which is convenient for the user to reasonably arrange charging or use the electronic cigarettes.

[0031] In the step S20, the performance of corresponding prompt operation according to the generated prompt information specifically includes: obtaining the prompt parameters corresponding to the prompt message, and using the obtained prompt parameters to perform the prompt operation. Specifically, when the corresponding prompt parameters are obtained based on the current quantity of electricity, the electronic cigarette will control the configured indicator and the vibration motor to prompt the user according to the prompt parameters. For example, when the detected quantity of electricity is 40%, and the corresponding prompt parameter is found to be the blue indicator, flashing once for 1S, and vibrating for 1S, the indicator will be controlled to show blue light and turn off after lighting for 1S; at the same time, the vibration motor will be controlled to vibrate for 1S and stop.

[0032] In an embodiment of present disclosure, the control method further includes:

S30, obtaining the current quantity of remained electricity when the output end of power supply device separates with the input end of atomizing device, and comparing the current quantity of remained electricity to the preset threshold of electricity;

S40, when the current quantity of remained electricity is lower than the threshold of electricity, performing an operation that prompts the user to charge.

[0033] Specifically, in the step S30 and S40, when it is detected that the output end of power supply device separates with the input end of atomizing device, it will mean that the atomizing device disconnects with the power supply device; that is, the user has completed the usage of atomizing device at that time. The preset threshold of electricity refers to a preset threshold with low quantity of electricity, for example, 5% of total electricity, 3% of total electricity, and 10% of total electricity. Compared the current quantity of remained electricity to the preset threshold of electricity, if the current quantity of remained electricity is greater than the preset threshold of electricity, it means that the quantity of remained electricity in the power supply device has not reached the alarm level at this time, and no prompt is required; if the current quantity of remained electricity is lower than or equal to the threshold of electricity, it means that the quantity of remained electricity in the power supply device has reached the alarm level at this time, and the electronic cigarette will perform an operation that prompts the user to charge. Wherein, the operation that prompts the user to charge may be a sound prompt, such as beeping alarm, or a voice prompt, such as the voice prompt of "low battery, please charge". Of course, if the electronic cigarette is equipped with a display device, a screen of low battery also can be displayed on the display device to prompt the user. It should be noted that the operation that prompts the user to charge is not limited to the above examples. In this embodiment, the information about the quantity of remained electricity is obtained when the user completes the current usage; if the quantity of remained electricity is insufficient, the user will be prompted in time, which can facilitate the user to charge in the idle time of the power supply device and avoid the situation of insufficient quantity of electricity when using the electronic cigarette next time.

[0034] The present disclosure also discloses a storage medium, which stores multiple instructions, and the instructions are applicable to be loaded by a processor and perform any of above control methods for an electronic cigarette.

[0035] The present disclosure also discloses an electronic cigarette, as shown in Fig.4, which includes at least a processor 20, a display 21, and a memory 22; and may further include a communication interface 23 and a bus 24. Wherein, the processor 20, the display 21, the mem-

ory 22, and the communication interface 23 communicate with each other through the bus 24. The display 21 is set to display the user guidance interface preset in the initial setting mode. The communication interface 23 can transmit information. The processor 20 can call logical instructions in the memory 22 to implement the method in the above-mentioned embodiments.

[0036] Furthermore, the logic instructions in the above-mentioned memory 22 may be implemented in the form of functional units of software and sold or used as independent products, as well as may be stored in a computer-readable storage medium.

[0037] As a computer-readable storage medium, the memory 22 may be configured to store software programs and computer-executable programs, such as the program instructions or modules corresponding to the method in the embodiments of present disclosure. The processor 30 executes functional applications and data processing by running the software programs, instructions, or modules stored in the memory 22, that is, implementing the methods in the above embodiments.

[0038] The memory 22 may include a program storage area and a data storage area; wherein, the program storage area may store an operating system and at least one application required by the functions; the data storage area may store data created according to the use of electronic cigarette, etc. Furthermore, the memory 22 may include a high-speed random-access memory, and may further include a non-volatile memory. For example, USB memory, mobile hard disk, read-only memory (ROM), random access memory (RAM), floppy disk or CD-ROM, other media that can store program codes, and transient storage medium.

[0039] Furthermore, the specific loading and executing process in above storage medium and multiple instruction processors in the electronic cigarette have been described in detail in above methods, which will not be listed one by one herein.

[0040] Finally, it should be noted that the above embodiments are merely provided for describing the technical solutions of the present disclosure, but not intended to limit the present disclosure. Although the present disclosure has been described in detail with reference to the foregoing embodiments, it should be understood that those of ordinary skills in this technical field can make modifications to the technical solutions recited in the foregoing embodiments or equivalent substitutions of part of the technical features. These modifications or substitutions do not make the essence of their corresponding technical solutions deviate from the spirit or scope of the technical solutions of the embodiments of present disclosure.

Claims

1. A control method for an electronic cigarette, wherein the electronic cigarette includes a power supply device and an atomizing device, wherein an output end of the power supply device is detachably connected with an input end of the atomizing device, wherein the control method includes:

   generating a prompt message when the output end of the power supply device contacts with the input end of the atomizing device; and
   performing a corresponding prompt operation according to the generated prompt message.

2. The control method of claim 1, wherein the prompt operation includes at least one of an indicator flashing and a vibration.

3. The control method of claim 1, wherein when the output end of power supply device contacts with the input end of the atomizing device, the generation of the prompt message includes:

   obtaining information about a current quantity of electricity when the output end of power supply device contacts with the input end of the atomizing device; and
   generating a corresponding prompt message according to the information about the current quantity of electricity.

4. The control method of claim 3, wherein when the output end of the power supply device contacts with the input end of the atomizing device, the obtaining information about the current quantity of electricity includes:

   obtaining a current voltage when the output end of the power supply device contacts with the input end of the atomizing device;
   determining the current quantity of electricity according to the current voltage; and
   determining a range of current quantity of electricity.

5. The control method of claim 4, wherein the generation of the corresponding prompt message according to the current quantity of electricity includes:

   retrieving corresponding prompt parameters from a preset database according to the determined range of electricity, wherein the prompt parameters include at least one of a color of an indicator, a flashing parameter, and a vibration parameter; and
   generating corresponding prompt message according to the retrieved prompt parameters.

6. The control method of claim 5, further comprising:

   pre-establishing the corresponding relationship

between the range of electricity and the prompt parameters; and
saving the corresponding relationship in the preset database.

7. The control method of claim 5, wherein the performance of corresponding prompt operation according to the generated prompt message specifically includes:

obtaining the prompt parameters corresponding to the prompt message; and
using the obtained prompt parameters to perform the prompt operation.

8. The control method of claim 1, further comprising:

obtaining the current quantity of remaining electricity when the output end of power supply device separates with the input end of atomizing device; and
comparing the current quantity of remaining electricity to a preset threshold of electricity, wherein when the current quantity of remaining electricity is lower than the threshold of electricity, an operation prompting a user to charge will be performed.

9. A storage medium, wherein the storage medium stores multiple instructions, and the instructions are applicable to a control method for an electronic cigarette that can be loaded by a processor and perform the control method according to any of claims 1-8..

10. An electronic cigarette comprising:

a processor applicable to implement instructions; and
a storage medium applicable to store multiple instructions, wherein the instructions are applicable to the control method for an electronic cigarette loaded by a processor and perform the control method according to any of claims 1-8

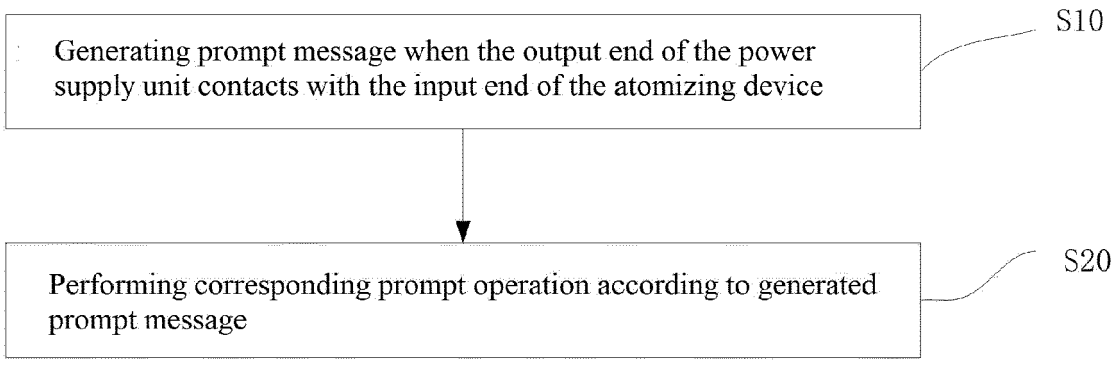

Fig. 1

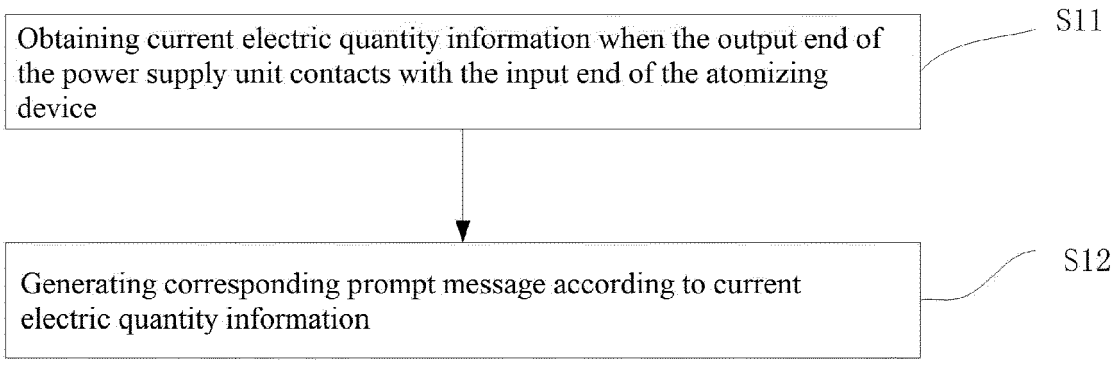

Fig. 2

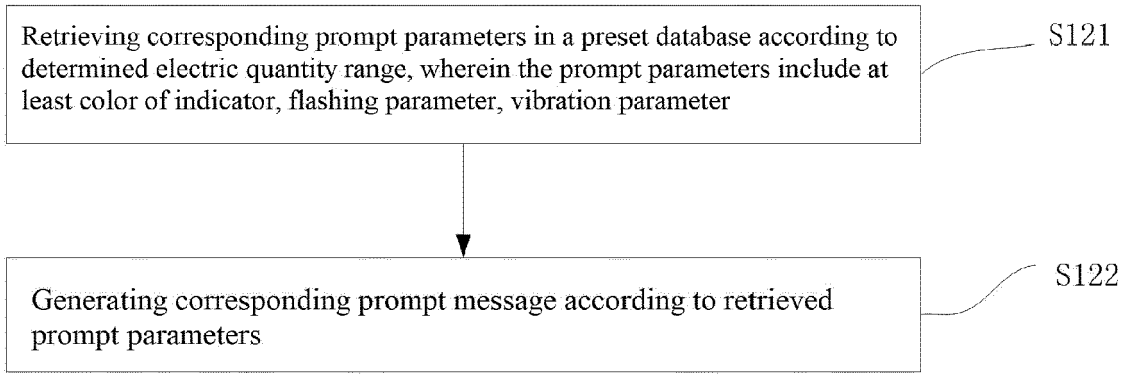

Fig. 3

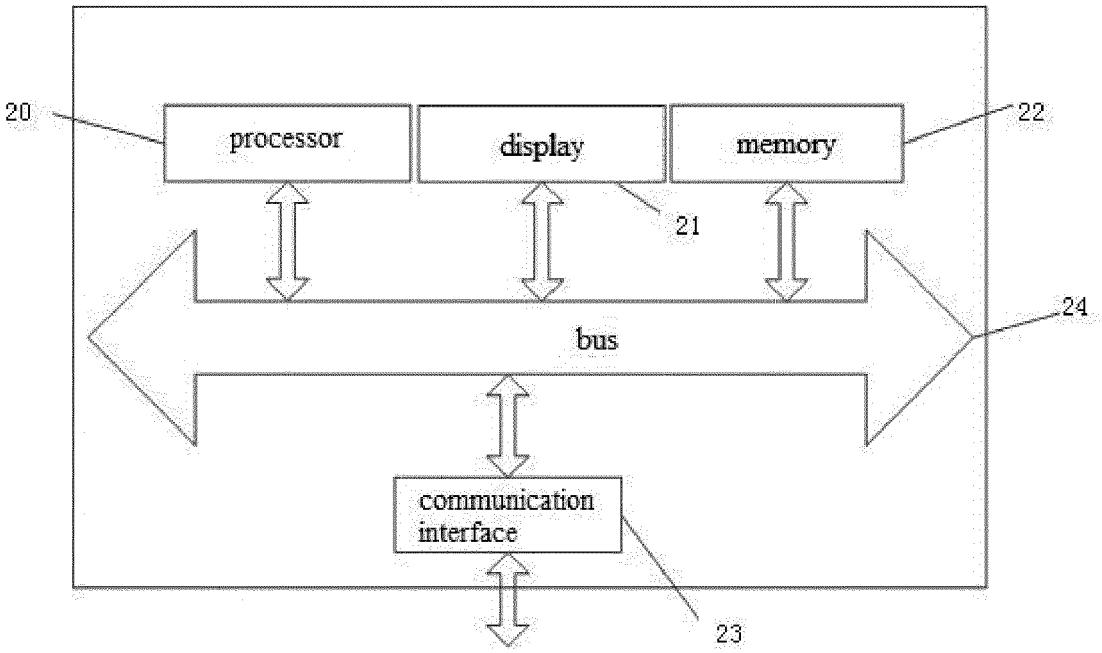
20
processor
display
memory
22
21
24
bus
communication interface
23

Fig. 4

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 20 17 7730

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X Y A	CN 108 936 813 A (CHANGZHOU PAITENG ELECTRONIC TECH SERVICE CO LTD) 7 December 2018 (2018-12-07) * paragraphs [0089] - [0093] * * figure 1 * -----	1,9,10 3,4 5-8	INV. A24F40/50 A24F40/60 A24F40/53 A61M15/06
X Y	WO 2019/042081 A1 (CHANGZHOU JWEI INTELLIGENT TECH CO LTD) 7 March 2019 (2019-03-07) * figures 1 - 2, 6 - 7 * & EP 3 677 132 A1 (JOYETECH EUROPE HOLDING GMBH) 8 July 2020 (2020-07-08) * figures 1-10 * * paragraphs [0051] - [0053], [0081] - [0088], [0095] - [0096], [0102] * -----	1,9,10 2-4	
X Y	US 2017/108840 A1 (HAWES ET AL) 20 April 2017 (2017-04-20) * paragraphs [0068], [0072], [0131] * * figures 1 - 2 * ----- US 2018/132528 A1 (SUR ET AL) 17 May 2018 (2018-05-17) * figure 2 * * paragraphs [0043], [0076] * -----	1,9,10 2-4	TECHNICAL FIELDS SEARCHED (IPC) A24F A61M

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	15 October 2020	Mier Abascal, Ana

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 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 20 17 7730

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

15-10-2020

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
CN 108936813 A	07-12-2018	NONE	
WO 2019042081 A1	07-03-2019	CN 109419042 A	05-03-2019
		EP 3677132 A1	08-07-2020
		US 2020196671 A1	25-06-2020
		WO 2019042081 A1	07-03-2019
US 2017108840 A1	20-04-2017	US 2017108840 A1	20-04-2017
		US 2020257255 A1	13-08-2020
US 2018132528 A1	17-05-2018	CA 3042623 A1	17-05-2018
		CN 109952038 A	28-06-2019
		EP 3537906 A1	18-09-2019
		JP 2019535264 A	12-12-2019
		KR 20190077091 A	02-07-2019
		US 2018132528 A1	17-05-2018
		WO 2018087740 A1	17-05-2018

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82