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Atomizer oil filling equipment and method

Abstract

An atomizer oil filling equipment provided includes an atomizer oil filling tool, a supporting plate, and an oil filling device. The atomizer oil filling tool is configured to load a plurality of atomizers with oil filling openings facing downward, a bottom of the atomizer oil filling tool defines first oil filling holes corresponding to the oil filling openings respectively. The supporting plate is configured to support the atomizer oil filling tool, and the supporting plate defines second oil filling holes corresponding to the first oil filling holes respectively; the oil filling device is movably installed on one side of the supporting plate away from the atomizer oil filling tool, the oil filling device has an oil filling needle, and the oil filling device fills the oil into the atomizers by the oil filling needle.

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Background/Summary

TECHNICAL FIELD

(1) The disclosure relates to atomizers of electronic cigarettes technologies, in particular to oil filling equipment and method for an atomizer.

BACKGROUND

(2) Nowadays, electronic cigarettes are popular, many smokers like to smoke with electronic cigarettes, and the electronic cigarettes generally have two types. One type of the electronic cigarettes are to burn tobacco-liquid the other type of the electronic cigarette are to burn the tobacco leaves. Each electronic cigarette burning the tobacco-liquid needs to fill the tobacco liquid into the atomize, and then the atomizer filled with the tobacco liquid is installed into the electronic cigarette and be heated.

(3) An existing oil filling method for atomizers is generally to put every atomizer into an oil filling equipment to fill oil. into the atomizers. As a result, the existing oil filling method is low efficient and high labor cost.

(4) In addition, the existing oil filling method is generally to fill oil from top to bottom, which may cause foreign matters or dander to enter into the atomizer during the oil filling.

SUMMARY

(5) At a first aspect, an atomizer oil filling equipment is provided. The atomizer oil filling equipment includes an atomizer oil filling tool, a supporting plate, and an oil filling device. The

atomizer oil filling tool is configured to load a plurality of atomizers with oil filling openings facing downward, a bottom of the atomizer oil filling tool defines first oil filling holes corresponding to the oil filling openings respectively. The supporting plate is configured to support the atomizer oil filling tool, and the supporting plate defines second oil filling holes corresponding to the first oil filling holes respectively; the oil filling device is movably installed on one side of the supporting plate away from the atomizer oil filling tool, the oil filling device has an oil filling needle, and the oil filling device fills the oil into the atomizers by the oil filling needle.

(6) At a second aspect, an atomizer oil filling equipment is provided. The atomizer oil filling equipment includes an atomizer oil filling tool, a supporting plate, and an oil filling device. The atomizer oil filling tool is configured to load a plurality of atomizers with oil filling openings, one side of the atomizer oil filling tool facing to the oil filling opening defines first oil filling holes corresponding to the oil filling openings respectively. The supporting plate is under the atomizer oil filling tool and faces to the oil filling opening through the first oil filling holes, the supporting plate is configured to support the atomizer oil filling tool with the plurality of the atomizers, and the supporting plate defines second oil filling holes corresponding to the first oil filling holes respectively. The oil filling device is movably installed on one side of the supporting plate away from the atomizer oil filling tool, the oil filling device having an oil filling needle, and the oil filling device filling the oil into the atomizers by the oil filling needle.

(7) At a third aspect, an oil filling method is provided. The oil filling method includes steps of taking out an atomizer module loaded with a plurality of atomizers from the atomizer packaging box; installing the atomizer module into the atomizer oil filling tool with the atomizer oil filling opening facing down; loading the atomizer oil filling tool equipped with the atomizer module into the atomizer oil filling equipment; and piercing the oil filling opening of each atomizer sequentially via the oil filling needle of the atomizer oil filling equipment from bottom to top and simultaneously filling tobacco-liquid into the atomizer.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

(1) In order to more clearly illustrate the technical solutions in the embodiments of the disclosure, the following will briefly introduce the accompanying drawings that need to be used in the descriptions of the embodiments or the prior art. Obviously, the accompanying drawings in the following description are only of the disclosure. For some embodiments, those of ordinary skill in the art can also obtain other drawings based on these drawings without paying creative efforts.

(2) FIG. **1** is the structural diagram of the atomizer oiling equipment equipped with the atomizer oil filling tool provided by the disclosure;

(3) FIG. **2** is the structure of the atomizer oiling equipment provided by the disclosure without carrying the atomizer oil filling tool Figure;

(4) FIG. **3** is a structural diagram of the atomizer oil filling tool equipped with an atomizer module provided by the disclosure;

(5) FIG. **4** is a structural diagram of the atomizer oil filling tool provided by the disclosure;

(6) FIG. **5** is provided by the disclosure;

(7) FIG. **6** is a structural diagram of the upper seat in the atomizer oil filling tool provided by the disclosure;

(8) FIG. **7** is the atomizer oil filling tool provided by the disclosure Structural diagram of the oil filling needle in the tool;

(9) FIG. **8** is the first block flow diagram of the oil filling method provided by the disclosure;

(10) FIG. **9** is the second flow block diagram of the oil filling method provided by the disclosure.

REFERENCE NUMBER IN THE DRAWING

(11) **100**, atomizer module; **110**, atomizer receiving part; **120**, atomizer; **200**, atomizer oil filling tool; **210**, upper seat; **211**, second positioning groove; **212**, guiding groove; **220**, the lower seat; **221**, the first oil filling hole; **222**, limit groove; **223**, escape groove; **224**, buffer groove; **225**, first positioning groove; **230**, guiding column; **240**, receiving space; **300**, supporting plate; **310**, second oil filling hole; **320**, first limiting structure; **321**, first limit block; **322**, second limit block; **330**, second limiting structure; **400**, oil filling device; **410**, oil filling needle; **411**, body; **412**, needling part; **413**, mounting part; **414**, oil filling hole; **500**, first driving structure; **510**, lifting cylinder; **520**, base; **530**, bracket; **540**, guiding shaft; **600**, second driving structures; **700**, oil filling barrel; **710**, oil filling pipe.

DETAILED DESCRIPTION OF THE EMBODIMENTS

(12) In order to make the technical problems, technical solutions and beneficial effects to be solved by the disclosure clearer, the disclosure will be further described in detail below in conjunction with the accompanying drawings and embodiments. It should be understood that the specific embodiments described here are only used to explain the disclosure, not to limit the disclosure.

(13) It should be noted that when an element is referred to as being “fixed” or “disposed on” another element, it may be directly on the other element or be indirectly on the other element. When an element is referred to as being “connected to” another element, it can be directly connected to the other element or indirectly connected to the other element.

(14) It is to be understood that the terms “length”, “width”, “top”, “bottom”, “front”, “rear”, “left”, “right”, “vertical”, “horizontal”, “top”, “bottom”, “inner”, “outer” and other indicated orientations or positional relationships are based on the orientations or positional relationships shown in the drawings, and are only for the convenience of describing the disclosure and simplifying the description, rather than indicating or implying the referred device Or elements must have a certain orientation, be constructed and operate in a certain orientation, and thus should not be construed as limiting the invention.

(15) In addition, the terms “first” and “second” are used for descriptive purposes only, and cannot be interpreted as indicating or implying relative importance or implicitly specifying the quantity of indicated technical features. Thus, a feature defined as “first” and “second” may explicitly or implicitly include one or more of these features. In the description of some inventions, “plurality” means two or more, unless otherwise specifically defined.

(16) Referring to FIG. **1**, an atomizer oil filling equipment is provided to simultaneously fill oil into a plurality of atomizers **120** from bottom to top, and improve filling efficiency, and prevent foreign matters or dander from entering into the atomizers **120** during filling oil.

(17) Referring to FIG. **1** and FIG. **2**, the atomizer oil filling equipment includes a supporting plate **300**, an atomizer oil filling tool **200**, and an oil filling device **400**. A plurality of atomizers **120** with the oil filling openings facing down are loaded on the atomizer oil filling tool **200**, and first oil filling holes **221** corresponds to the oil filling openings are defined on the bottom of the atomizer oil filling tool **200**. The atomizer oil filling tool **200** is loaded on the supporting plate **300**, and second oil filling holes **310** are defined on the supporting plate **300** corresponding to the first oil filling hole **221**. The oil filling device **400** is moveably mounted to one end of the supporting plate **300** away from the atomizer oil filling tool **200**. An oil filling needle **410** is located at an outlet of the oil filling device **400**, and the oil filling device **400** fills oil into the atomizer **120** via the oil filling needle **410**.

(18) In actual use, first, the plurality of the atomizers **120** with the oil filling openings facing down are first installed on the atomizer oil filling tool **200** at the same intervals; then, the atomizer oil filling tool **200** with atomizers **120** are installed on the supporting plate **300**, and the first oil filling holes **221** on the atomizer oil filling tool **200** are aligned with the second oil filling holes **310** on the supporting plate **300**; finally the oil filling needle **410** pass through a group of the second oil filling hole **310**, the first oil filling hole **221**, and the oil filling opening orderly, and the oil filling device **400** fills oil into the atomizer **120** via the oil filling needle **410**.

(19) It can be seen that in the atomizer oiling equipment described above, the plurality of the atomizers **120** with the oil filling opening facing down are capable of being installed in the the atomizer oil filling tool **200** at the same intervals, and the oil filling device **400** is movably arranged on the one end of the the supporting plate **300** far away from the atomizer oil filling tool **200**, and filling oil into each atomizer **120** via the oil filling needle **410**, so as to realize oil filling for the plurality of the atomizers **120** from bottom to top, improve the filling efficiency and at the same time prevent foreign matters or dander from entering into each atomizer **120** during filling.
(20) Referring to FIG. **2**, further, a first limiting structure **320** is set on the supporting plate **300**, and when the atomizer oil filling tool **200** is loaded on the supporting plate **300**, the first limiting structure **320** controls the atomizer oil filling tool **200** to be limited in a horizontal direction, so that each first oil filling hole **221** of the atomizer oil filling tool **200** is aligned with each second oil filling hole **310** correspondingly on the supporting plate **300**.
(21) In detail, the first limiting structure **320** includes two opposite first limiting block **321** arranged along a length direction of the atomizer oil filling tool **200**, and at least one second limiting block **322** arranged along a width direction of the atomizer oil filling tool **200**, the first limiting block **321** and the second limiting block **322** form a limiting area in the horizontal direction. When the atomizer oil filling tool **200** is loaded on the supporting plate **300**, the atomizer oil filling tool **200** is just located on the limit area, so that the first oil filling hole **221** of the atomizer oil filling tool **200** is aligned with the second oil filling hole **310** of the supporting plate **300**.
(22) Further, a second limiting structure **330** is disposed on the supporting plate **300**. When the atomizer oil filling tool **200** is loaded on the supporting plate **300**, the second limiting structure **330** limits the atomizer oil filling tool **200** in the vertical direction so that the oil filling needle **410** can be inserted into the oil filling opening of the atomizer **120**.
(23) In detail, the second limiting structure **330** include a baffle disposed above the supporting plate **300**, and a limiting area is formed between the baffle and the supporting plate **300** in the vertical direction. When the atomizer oil filling tool **200** is loaded on the supporting plate **300**, the baffle plate and the supporting plate **300** limit the atomizer oil filling tool **200** in the limit area, that it prevents the atomizer oil filling tool **200** moving during the oil filling needle **410** is being inserted into the oil filling opening of the atomizer **120**.
(24) It can be understood that, the method of filling the atomizer **120** from bottom to top, the oil filling needle **410** needs to penetrate silica gel sealing the oil filling opening of the atomizer **120**, therefore, the atomizer oil filling tool **200** is required to be fixed during the oil filling needle **410** is penetrating the silica gel and it ensures the silica gel .is penetrated.
(25) Referring to FIG. **2**, the atomizer oil filling equipment further includes a first driving structure **500**. The first driving structure **500** is connected with the supporting plate **300**, and is configured to drive the supporting plate **300** to take the atomizer to move toward the oil filling needle **410**, so that the oil filling needle **410** can be inserted into the oil filling opening of the atomizer **120**.
(26) In detail, when the atomizer oil filling tool **200** is loaded on the supporting plate **300**, the first driving structure **500** drives the supporting plate **300** to take the atomizer oil filling tool **200** and the atomizer loaded on the atomizer oil filling tool **200** to move toward the oil filling needle **410** so that the oil filling needle **410** can pass through the second oil filling hole **310**, the first oil filling hole **221**, and the silica gel sealing on the oil filling opening in order to filling oil into the atomizer **120**.
(27) In this embodiment, the first driving structure **500** can be a lifting cylinder **510**, and the atomizer oil filling equipment can also include a base **520**, and the lifting cylinder **510** is disposed on the base **520** via a bracket **530**, a guiding shaft **540** is connected between the supporting plate **300** and the bracket **530**, The first driving structure **500** drives the supporting plate **300** to move relative to the bracket **530** along the guiding shaft **540**, so that the supporting plate **300** moves toward the oil filling needle **410**.

(28) Referring to FIG. **2**, the atomizer oil filling equipment further includes a second driving structure **600**. The second driving structure **600** is connected with the oil filling device **400**, and is configured to drive the oil filling device **400** and the oil filling needle **410** of the oil filling device **400** to move along a direction of loading the atomizers **120** on the atomizer oil filling tool **200**, so that the oil filling needle **410** can filling oil to each atomizer **120**.
(29) For example, in this application, when the atomizer **120** is evenly loaded on the atomizer oil filling tool **200** along the length direction of the atomizer oil filling tool **200**, the second driving structure **600** drives the oil filling device **400** and the oil filling device **400** is set The oil filling needle **410** moves along the length direction of the atomizer oil filling tool **200**.
(30) In the disclosure, the second driving structure **600** may be a linear motor or a screw motor.
(31) In addition, the atomizer oil filling equipment also includes an oil filling barrel **700** for storing tobacco-liquid. The oil filling barrel **700** is connected with the oil filling device **400** via the oil filling pipe **710**, and is configured to supply oil to the oil filling device **400**, so that the oil filling device **400** can filling the tobacco-liquid into the atomizer **120** via the oil filling needle **410**.
(32) Referring to FIG. **3**, an atomizer oil filling tool **200** is also provided to load the atomizer module **100**, so as to put the atomizer module **100** into the atomizer oiling equipment, to fill the atomizer module **100** with the oil.
(33) In detail, the atomizer module **100** includes an atomizer receiving part **110**, and the plurality of atomizers **120** to be filled with the oil are placed on the atomizer receiving part **110** at the same intervals, and the atomizers **120** can be exposed in a manner of the oil filling opening facing down. For example, a plurality of receiving holes are defined on the atomizer receiving part **110** at the same intervals along the length direction of the atomizer receiving part **110**, and each receiving hole can received one atomizer **120** to be filled with the oil.
(34) Referring to FIG. **3** and FIG. **4**, an atomizer oil filling tool **200** includes an upper seat **210** and a lower seat **220**. The upper seat **210** is detachably arranged on the lower seat **220** along the vertical direction, and a receiving space **240** is defined between the upper seat **210** and the lower seat **220** to received the atomizer receiving part **110**.
(35) In detail, when the atomizer receiving part **110** is located in the receiving space **240**, the upper seat **210** and the lower seat **220** fix the atomizer receiving part **110**.
(36) Further, referring to FIG. **5**, first oil filling holes **221** are defined on the lower seat **220** corresponding to the oil filling opening of each atomizer **120** received in the atomizer receiving part **110**.
(37) In detail, when the atomizer module **100** is loaded into the atomizer oil filling tool **200**, the atomizer receiving part **110** is located in the receiving space **240**, and the oil filling opening of each atomizer **120** in the atomizer receiving part **110** just aligns with each first oil filing hole **221**.
(38) In actual use, disassembling the upper seat **210** and the lower base **220**; installing the atomizer module **100** with the oil filling opening of the atomizer **120** facing down on the lower base **220**, and making each atomizer **120** align the oil filling opening with the corresponding first oil filling hole **221**; then installing the upper seat **210** on the lower seat **220**, and the upper seat **210** and the lower seat **220** match the atomizer module **100** to fix the atomizer receiving part **110**, that the loading the atomizer module **100** by the atomizer oil filling tool **200** is finished; putting the atomizer oil filling tool **200** loaded with the atomizer module **100** into the atomizer oiling filling equipment to fill with the oil.
(39) It can be understood that after the upstream manufacturer produce the atomizers **120**, in order to facilitate the packaging and transportation of the atomizers **120**, it is generally used to pack the plurality of atomizers **120** into the atomizer module **100** through the atomizer receiving part **110**. Therefore, the atomizer oil filling tool **200** can directly install the entire atomizer module **100**, which can reduce the time to put the atomizers **120** into the atomizer oil filling tool **200** because there is no need to take out the atomizers **120** from the atomizer receiving part **110** one by one. and the atomizer oiling equipment is enabled to fill the plurality of the atomizers **120** with the oil.

(40) In addition, the first oil filling hole **221** of the atomizer oil filling tool **200** is arranged on the lower seat **220**, so that the atomizer **120** can be filled with the oil from bottom to top, it prevents foreign matters or dander from entering into into the atomizer **120** during filed with the oil. It should be noted that, the detail oil filling method from bottom to top can refer to the drip bottle, which inserts the oil filling needle **410** into an object made of silicone and seal the oil filling opening.
(41) It can be seen that the atomizer oil filling tool **200** is provided with the upper seat **210** and the lower seat **220** both being detachable, and the receiving space **240** is defined between the upper seat **210** and the lower seat **220** to receive the atomizer receiving part **110**, and the entire atomizer module **100** can be loaded into the atomizer oil filling tool **200** to improve the filling efficiency. In addition, there is also provided with the first oil filling hole **221** defined on the lower seat **220**, which can realize that the oil can be filed into the atomizer **120** from bottom to top, and the foreign matter or the dander are prevented from entering into the atomizer **120** during the oil is filled.
(42) Referring to FIG. **5**, in detail, when the atomizer module **100** is loaded into the atomizer oil filling tool **200**, the limit groove **222** controls the position of the atomizer receiving part **110** in the atomizer module **100** in the receiving space **24**, that the oil filling opening in the atomizer **120** can be aligned with the first oil filling hole **221** in the lower seat **220**.
(43) Further, in order to make the atomizer module **100** easily be installed into the limiting groove **222** and removed from the limiting groove **222**, an escape groove **223** is defined in an end of the lower seat **220** adjacent to the receiving space **240**, and, the escape groove **223** further communicates with the limiting slot **222**.
(44) Furthermore, when the atomizer module **100** is installed into the limiting groove **222**, the atomizer receiving part **110** will be tightly attached to a side wall around the limiting groove **222**. in order to prevent the atomizer receiving part **110** from being tightly attached to the side wall around the limiting groove **222** which is inconvenient to move the atomizer module **100** from the limiting groove **222**, a plurality of buffer slots **224** are arranged on the lower seat **220**, and the buffer slots **224** communicate with the limiting slots **222** respectively.
(45) Referring to FIG. **3** and FIG. **5**, the atomizer **120** generally has a head, a middle part, and a bottom, the oil filling opening is generally arranged on the head. In some embodiments, when the atomizers **120** are loaded on the atomizer receiving part **110**, the atomizer receiving part **110** at least restricts the middle of the atomizer **120**. At this time, the limiting groove **222** is provided with a first positioning groove **225**, the first oil filling hole **221** is arranged on the first positioning groove **225**, and the first positioning groove **225** can limit the head of the atomizer **120**. As a result, the oil filling opening of the atomizer **120** is aligned with the first oil filling hole **221**.
(46) Specifically, when the atomizer module **100** is installed into the limiting groove **222** with the head of the atomizer **120** facing down, the first positioning groove **225** provided on the limiting groove **222** is aligned with the head of the corresponding atomizer **120**. The part is limited so that the oil filling opening provided on the head can be aligned with the first oil filling hole **221** on the lower base **220**.
(47) It can be understood that, in some embodiments, the head of the atomizer **120** is a flat structure, and the first positioning groove **225** can play a fool-proof role, so that the oil filling opening can be aligned with the first oil filling hole **221** in the lower base **220**.
(48) Referring to FIG. **3** and FIG. **6**, the atomizer **120** generally has a head, a middle part and a bottom, the oil filling opening is generally defined in the head. In some embodiments, when the atomizer **120** is loaded on the atomizer receiving part **110**, the atomizer receiving part **110** at least restricts the middle of the atomizer **120**. At this time, a second positioning groove **211** is provided in the upper seat **210**, and the second positioning groove **211** can limit the bottom of the atomizer **120**, that the positions of the atomizers related to the oil filling tool **200** are further limited, and at the same time, it can prevent the atomizer **120** from shaking during the atomizers **120** are being filled with the oil.

(49) It can be understood that, in some embodiments, the atomizer oil filling equipment fills oil by inserting the oil filling needle **410** into the silica gel sealed on the oil filling opening, which may cause the atomizer **120** to shake, so the first positioning groove **225** is defined to limit the head of the atomizer **120** and the second positioning groove **211** is defined to limit the bottom of the atomizer **120**, which can improve the stability of oil filling.
(50) Further, referring to FIG. **7**, in order to make the oil filling needle **410** easily inserting into the oil filling opening of the atomizer **120**, an needling portion **412** is disposed at an end of the oil filling needle **410** away from the oil outlet of the oil filling device. When filling the oil through the oil filling opening, the oil filling needle **410** filling oil into the atomizer **120** by piercing the silica gel sealed on the oil filling opening via the needling part **412**. the needling part **412** may be in a tapered shaped.
(51) In addition, the oil filling hole **414** of the oil filling needle **410** can be disposed on the side wall of the oil filling needle **410** near the end of the needling part **412**. That is to say, the oil filling needle **410** includes a cylindrical main body **411**, and a needling part **412**, and a mounting parts **413** respectively arranged at both ends of the main body **411**, the mounting part **413** is configured to connect with the oil outlet hole of the oil filling device **400**, and the needling part **412** is configured to fill the oil into the atomizer **120**, and the oil filling hole **414** is defined in a side wall of the main body **411** near the end of the needling part **412**.
(52) It can be understood that, in some embodiments, the oil filling opening of the atomizer **120** is generally opposite to the exhaust hole in the atomizer **120**, so if the oil filling hole **414** of the oil filling needle **410** adopts an oblique opening like a tradition way, the oil filling needle **410** may fill the tobacco-liquid into the exhaust hole of the atomizer **120** when filling oil, which may block the exhaust hole.
(53) In addition, the needling part **412** of the oil filling needle **410** pierces through the silica gel sealed on the oil filling opening to fill oil into the atomizer **120**, if the oil filling hole **414** of the oil filling needle **410** adopts an oblique opening like a tradition way, an edge of the oil filling hole is also inclined, and a needle wall of the oil filling needle is generally thin, so the edge of the oil filling hole will become very sharp, and it is easy to break a hole in the silicone during the silicone is impaled by the needling par **410**, that will make the pollutants in the air easily enter into the atomizer **120** and pollute the tobacco-liquid.
(54) It can be seen that, the filling hole **414** is defined in the side wall of the main body **411** adjacent to the end of the needling part **412** instead of directly defining the oil filling hole **414** in the needling part **412**, which can well prevent the pollutants from entering into the atomizer **120** and polluting the tobacco-liquid.
(55) Referring to FIG. **5**, in some embodiments, the lower base **220** is provided with several guiding columns **230** detachably mounted to the lower base **220**, and the upper seat **210** defines guiding grooves **212** corresponding to each guiding column **230** respectively, when the upper seat **210** is installed on the lower base **220**, each guiding columns **230** are located in each guiding groove **212**, so as to realize that the upper seat **210** and the lower base **220** are assembled accurately and quickly.
(56) Specifically, the guiding column **230** can be detachably fixed on the lower base **220** by bolts. It can make the guiding column **230** of different heights easily replay according to the atomizer module **100** of different heights, and improves a compatibility of the atomizer oil filling tool **200**.
(57) In other embodiments, the upper base **210** is provided with several guiding columns **230** detachably mounted to the upper base **210**, and the lower base **220** defines guiding grooves **212** corresponding to guiding columns **230** respectively, the upper seat **210** is installed on the lower base **220**, each guiding column **230** is located in each guiding groove **212**.
(58) Referring to FIG. **8**, an oil filling method is provided and the oil filling method, includes follow steps.
(59) At step **103**, taking out the atomizer module loaded with a plurality of atomizers from the

atomizer packaging box.
(60) At step **104**, installing the atomizer module into the atomizer oil filling tool with the atomizer oil filling opening facing down.
(61) At step **105**, loading the atomizer oil filling tool equipped with the atomizer module into the atomizer oil filling equipment.
(62) At step **106**, piercing the oil filling opening of each atomizer sequentially via the oil filling needle of the atomizer oil filling equipment from bottom to top and simultaneously filling tobacco-liquid into the atomizer.
(63) That is to say, in the oil filling method provided, the atomizer module loaded with the plurality of the atomizers is loaded into the atomizer oil filling tool, and then the atomizer oil filling tool is loaded into the atomizer oil filling equipment. In addition, the oil filling opening of each atomizer is facing down, and then the oil filling needle of the atomizer oil filling equipment. fill oil into the atomizer through the oil filling opening. This method can ensure that pollutants will not enter into the atomizer during the oil filling process and ensure the cleanliness of the atomizer.
(64) Further, referring to FIG. **9**, before step **102**, the oil filling method also includes following steps.
(65) At step **101**, after the atomizer is processed, loading a predetermined number of atomizers into the atomizer module with the oil filling opening facing down.
(66) For example, twenty atomizers can be packed into the one atomizer module as a group. That is to say, there are twenty atomizers to be filled in one atomizer module.
(67) At step **102**, loading a plurality of groups of atomizer modules equipped with atomizers into the atomizer packaging box.
(68) For example, five groups of atomizer modules loaded with atomizers can be packed into the atomizer box. That is to say, there are five groups of atomizer modules in one atomizer box, that is, one hundred atomizers are divided into **5** groups of atomizer modules. This method can realize that the atomizers can be filled with oil in modularization, and it will improves efficiency of checking defective rate of the atomizers.
(69) The above are only preferred embodiments of the disclosure, and are not intended to limit the disclosure. Any modifications, equivalent replacements and improvements made within the spirit and principles of some inventions should be included in the protection scope of some inventions inside.

Claims

1. An oil filling method, comprising: taking out an atomizer module loaded with a plurality of atomizers from an atomizer packaging box; installing the atomizer module into an atomizer oil filling tool an atomizer oil filling opening facing down; loading the atomizer oil filling tool equipped with the atomizer module into an atomizer oil filling equipment; and piercing the oil filling opening of each atomizer sequentially via an oil filling needle of the atomizer oil filling equipment from bottom to top and simultaneously filling tobacco-liquid into the atomizer.
2. The oil filling method according to claim 1, wherein before taking out the atomizer module loaded with a plurality of atomizers from the atomizer packaging box, it also includes: loading a predetermined number of atomizers into the atomizer module with the oil filling opening facing down after the atomizer is processed; and loading a plurality of groups of the atomizer modules equipped with atomizers into the atomizer packaging box.