

# US Patent & Trademark Office

## Patent Public Search | Text View

United States Patent Application Publication

20250256002

Kind Code

A1

Publication Date

August 14, 2025

Inventor(s)

LONG; Jiwu

### ESSENTIAL OIL ATOMIZATION AND PUMPING APPARATUS

#### Abstract

The present utility model provides an essential oil atomization and pumping apparatus, including a control circuit board and a cartridge assembly for essential oil atomization, where the cartridge assembly is electrically connected to the control circuit board, and the cartridge assembly includes a ceramic heating strip for heating an atomized essential oil; the apparatus further includes an air pump assembly for pumping atomized mist from a position of the cartridge assembly to a position of a mist outlet at an outer side, where the air pump assembly includes an air pump unit and an air pump block for delimiting the air pump unit, the air pump unit is interconnected to the cartridge assembly through an air inlet hose, and the cartridge assembly is connected to the mist outlet through a mist outlet hose.

**Inventors:** LONG; Jiwu (Shaoyang, CN)

**Applicant:** LONG; Jiwu (Shaoyang, CN)

**Family ID:** 1000007818262

**Appl. No.:** 18/641062

**Filed:** April 19, 2024

#### Foreign Application Priority Data

CN 2024202910890

Feb. 11, 2024

#### Publication Classification

**Int. Cl.:** A61L9/03 (20060101)

**U.S. Cl.:**

**CPC** A61L9/037 (20130101); A61L2209/133 (20130101); A61L2209/134 (20130101)

## Background/Summary

### CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The application claims priority to Chinese patent application No. 2024202910890, filed on Feb. 11, 2024, the entire contents of which are incorporated herein by reference.

### TECHNICAL FIELD

[0002] The present utility model relates to the technical field of atomization and pumping apparatuses, and in particular, to an essential oil atomization and pumping apparatus with an outstanding effect in use.

### BACKGROUND

[0003] Hairdressing electronic products such as hair straightening combs and hair straighteners are common products used by people in daily life. Generally, a functional feature of the products is to add a sprayer apparatus on the basis of a conventional hairdressing product, to spread a cosmeceutical spray over hair and scalp during hair brushing.

[0004] With continuous development and progresses of technologies, existing hairdressing products have been greatly improved and enhanced in aspects of specific functions and structures. Some become easier to hold, and some are upgraded with temperature regulation mechanisms, bringing better user experience. However, there are still some drawbacks. For example, a spray actually mostly relies on atomization by using an atomizer piece, or a spraying effect is improved by using a fan, but the effect is poor, or a specific structural part for atomization has a problem that an effect in use is not good due to relatively poor performance.

[0005] For example, in the utility model patent application No. CN202123212048.3 entitled “Spray Hair Straightening Comb”, a spray hair straightening comb is specifically disclosed, and includes a shaft and a comb part. The shaft is fixed below the comb part, and the comb part is provided with teeth, where: an upper part of the shaft is provided with a spray opening, an atomizer is disposed in the shaft, and an output end of the atomizer is provided on the spray opening. As the spray opening is provided on the shaft and is kept a specific distance from the teeth, when a spray is spread, the spray does not stick to the teeth, so that a spraying effect is improved.

[0006] The foregoing solution in a conventional technology has a problem of a relatively poor spraying effect. To further enhance product performance, a specific aspect of an atomization and spraying structure needs to be improved and enhanced.

### SUMMARY

[0007] A problem in a conventional technology to be resolved in this application is that:

[0008] Although existing hairdressing products have been greatly improved and enhanced in aspects of specific functions and structures, there are still some drawbacks. For example, a spray actually mostly relies on atomization by using an atomizer piece, or a spraying effect is improved by using a fan, but the effect is poor, or a specific structural part for atomization has a problem that an effect in use is not good due to relatively poor performance.

[0009] The present utility model resolves the technical problems with the following solutions.

[0010] An essential oil atomization and pumping apparatus is provided, and includes a control circuit board and a cartridge assembly for essential oil atomization, where the cartridge assembly is electrically connected to the control circuit board, and the cartridge assembly includes a ceramic heating strip for heating an atomized essential oil.

[0011] The apparatus further includes an air pump assembly for pumping atomized mist from a position of the cartridge assembly to a position of a mist outlet at an outer side, where the air pump assembly includes an air pump unit and an air pump block for delimiting the air pump unit, the air pump unit is interconnected to the cartridge assembly through an air inlet hose, and the cartridge assembly is connected to the mist outlet through a mist outlet hose.

[0012] The cartridge assembly further includes a cartridge body, a heating strip support that correspondingly fits a shape of the cartridge body, a lower cartridge casing, an oil-absorbent cotton at an inner side of the lower cartridge casing, and a cartridge pin for an electrically conductive connection.

[0013] The heating strip support, the oil-absorbent cotton, and the ceramic heating strip are in an inner space surrounded by the cartridge body and the lower cartridge casing that fit into and connected to each other, an oil supply hole corresponding to a position of the ceramic heating strip is provided at an upper part of the heating strip support, and the ceramic heating strip is at an inner side of the oil supply hole.

[0014] The apparatus further includes a main body pin disposed on the control circuit board or electrically connected to the control circuit board, where a position of the main body pin corresponds to a position of the cartridge pin.

[0015] Preferably, a periphery of the lower cartridge casing is wrapped by a cartridge waterproof gasket, and an outer side of the heating strip support is wrapped by support silica gel.

[0016] The apparatus further includes heating strip silica gel for delimiting the ceramic heating strip.

[0017] Preferably, the cartridge assembly further includes a cartridge magnet.

[0018] A magnet delimiting groove for embedding and accommodating the cartridge magnet is provided at the inner side of the lower cartridge casing. Preferably, the air pump block includes an air pump accommodating groove in the middle and connection pieces at two ends for fixed connections.

[0019] The air pump assembly is accommodated in the air pump accommodating groove by snap-fit.

[0020] Preferably, a snap fastener or a hook for delimiting the mist outlet hose and/or the air inlet hose is disposed on the air pump block by one-piece molding.

[0021] The snap fastener or the hook is at one end of the air pump block or at both ends of the air pump block.

[0022] A hose groove for accommodating the hose is formed at an inner side of the snap fastener or the hook.

[0023] Preferably, the heating strip support and the lower cartridge casing are movably connected in a detachable manner.

[0024] The oil-absorbent cotton is accommodated at the inner side of the lower cartridge casing.

[0025] Conductive connection holes at corresponding positions for running through the cartridge pin are provided on the oil-absorbent cotton and the lower cartridge casing.

[0026] Preferably, a plurality of snap-fit pieces are disposed by one-piece molding at an outer side of a lower part of the heating strip support.

[0027] Snap-fit holes corresponding to the snap-fit pieces are provided on the lower cartridge casing.

[0028] Preferably, protruding joints in joint with the air inlet hose and the mist outlet hose are further disposed at the bottom of the lower cartridge casing by one-piece molding.

[0029] Both the air inlet hose and the mist outlet hose are provided with elbow connection pieces at one end of the cartridge assembly for connections to the protruding joints.

[0030] Preferably, a silica gel groove that corresponds to the heating strip silica gel and that is used to accommodate the heating strip silica gel is provided at an inner side of the heating strip support.

[0031] Preferably, an upper part of the heating strip support is protruding upwardly to form an oil supply protruding platform.

[0032] A support silica gel hole, corresponding to a position of the oil supply protruding platform, that fits into a shape of the oil supply protruding platform is provided on the support silica gel.

[0033] The upper part of the heating strip support is wrapped by the whole support silica gel.

[0034] A technical effect achieved in this application by resolving the technical problem is as

follows: [0035] Compared with the conventional technology, according to the essential oil atomization and pumping apparatus provided in the present utility model, the control circuit board **11** and the cartridge assembly **12** for essential oil atomization are disposed together, where the cartridge assembly **12** is electrically connected to the control circuit board **11**, and the cartridge assembly **12** includes the ceramic heating strip **125** for heating an atomized essential oil; the apparatus further includes the air pump assembly **13** for pumping atomized mist from a position of the cartridge assembly **12** to a position of a mist outlet at an outer side, where the air pump assembly **13** includes an air pump unit and an air pump block **16** for delimiting the air pump unit, the air pump unit is interconnected to the cartridge assembly **12** through the air inlet hose **15**, and the cartridge assembly **12** is connected to the mist outlet through a mist outlet hose **14**; the cartridge assembly **12** further includes the cartridge body **121**, the heating strip support **123** that correspondingly fits the shape of the cartridge body **121**, the lower cartridge casing **129**, the oil-absorbent cotton **128** at the inner side of the lower cartridge casing **129**, and the cartridge pin **126** for an electrically conductive connection; the heating strip support **123**, the oil-absorbent cotton **128**, and the ceramic heating strip **125** are in the inner space surrounded by the cartridge body **121** and the lower cartridge casing **129** that fit into and connected to each other, the oil supply hole **1231** corresponding to the position of the ceramic heating strip **125** is provided at the upper part of the heating strip support **123**, and the ceramic heating strip **125** is at the inner side of the oil supply hole **1231**; and the apparatus further includes the main body pin disposed on the control circuit board **11** or electrically connected to the control circuit board **11**, where the position of the main body pin corresponds to the position of the cartridge pin **126**. In actual application, the air pump assembly **13** is used for mist pumping. An application effect is better with higher stability and better user experience.

---

## Description

### BRIEF DESCRIPTION OF DRAWINGS

[0036] FIG. 1 and FIG. 2 are schematic diagrams of a stereoscopic view of a structure of an essential oil atomization and pumping apparatus according to the present utility model.

[0037] FIG. 3 and FIG. 4 are schematic diagrams of an exploded view of a structure of an essential oil atomization and pumping apparatus according to the present utility model. In the figures: [0038] **11**: control circuit board; **12**: cartridge assembly; **123**: heating strip support; **1231**: oil supply hole; **1233**: snap-fit piece; **1234**: silica gel groove; **124**: heating strip silica gel; **125**: ceramic heating strip; **126**: cartridge pin; **127**: cartridge magnet; **128**: oil-absorbent cotton; **129**: lower cartridge casing; **1292**: snap-fit hole; **1293**: cartridge waterproof gasket; **1295**: magnet delimiting groove; **1297**: protruding joint; **13**: air pump assembly; **14**: mist outlet hose; **15**: air inlet hose; **16**: air pump block; **161**: snap fastener or hook; and **17**: elbow connection piece.

### DETAILED DESCRIPTION OF THE EMBODIMENTS

[0039] To make the purposes, technical solutions, and advantages of the present utility model clearer, the following further describes the present utility model in detail with reference to the accompanying drawings and embodiments. It should be understood that, specific embodiments described herein are merely used to explain the present utility model but not to limit the present utility model.

[0040] Refer to FIG. 1 to FIG. 4. An essential oil atomization and pumping apparatus **1** provided in the present utility model includes a control circuit board **11** and a cartridge assembly **12** for essential oil atomization, where the cartridge assembly **12** is electrically connected to the control circuit board **11**, and the cartridge assembly **12** includes a ceramic heating strip **125** for heating an atomized essential oil. Another functional component similar to the ceramic heating strip **125**, for example, a heating sheet, belongs to an equivalent technical solution.

[0041] The apparatus further includes an air pump assembly **13** for pumping atomized mist from a position of the cartridge assembly **12** to a position of a mist outlet at an outer side, where the air pump assembly **13** includes an air pump unit and an air pump block **16** for delimiting the air pump unit, the air pump unit is interconnected to the cartridge assembly **12** through an air inlet hose **15**, and the cartridge assembly **12** is connected to the mist outlet through a mist outlet hose **14**.

[0042] The cartridge assembly **12** further includes a cartridge body **121**, a heating strip support **123** that correspondingly fits a shape of the cartridge body **121**, a lower cartridge casing **129**, an oil-absorbent cotton **128** at an inner side of the lower cartridge casing **129**, and a cartridge pin **126** for an electrically conductive connection. During actual assembly, the cartridge body **121** directly covers an upper part of the lower cartridge casing **129** to form a sealed inner oil storage space.

[0043] The heating strip support **123**, the oil-absorbent cotton **128**, and the ceramic heating strip **125** are in an inner space surrounded by the cartridge body **121** and the lower cartridge casing **129** that fit into and connected to each other, an oil supply hole **1231** corresponding to a position of the ceramic heating strip **125** is provided at an upper part of the heating strip support **123**, and the ceramic heating strip **125** is at an inner side of the oil supply hole **1231**.

[0044] The apparatus further includes a main body pin disposed on the control circuit board **11** or electrically connected to the control circuit board **11**, where a position of the main body pin corresponds to a position of the cartridge pin **126**.

[0045] In this application, the control circuit board **11** and the cartridge assembly **12** for essential oil atomization are disposed at the same time, where the cartridge assembly **12** is electrically connected to the control circuit board **11**, and the cartridge assembly **12** includes the ceramic heating strip **125** for heating an atomized essential oil; the apparatus further includes the air pump assembly **13** for pumping atomized mist from a position of the cartridge assembly **12** to a position of a mist outlet at an outer side, where the air pump assembly **13** includes an air pump unit and an air pump block **16** for delimiting the air pump unit, the air pump unit is interconnected to the cartridge assembly **12** through the air inlet hose **15**, and the cartridge assembly **12** is connected to the mist outlet through a mist outlet hose **14**; the cartridge assembly **12** further includes the cartridge body **121**, the heating strip support **123** that correspondingly fits the shape of the cartridge body **121**, the lower cartridge casing **129**, the oil-absorbent cotton **128** at the inner side of the lower cartridge casing **129**, and the cartridge pin **126** for an electrically conductive connection; the heating strip support **123**, the oil-absorbent cotton **128**, and the ceramic heating strip **125** are in the inner space surrounded by the cartridge body **121** and the lower cartridge casing **129** that fit into and connected to each other, the oil supply hole **1231** corresponding to the position of the ceramic heating strip **125** is provided at the upper part of the heating strip support **123**, and the ceramic heating strip **125** is at the inner side of the oil supply hole **1231**; and the apparatus further includes the main body pin disposed on the control circuit board **11** or electrically connected to the control circuit board **11**, where the position of the main body pin corresponds to the position of the cartridge pin **126**. In actual application, the air pump assembly **13** is used for mist pumping. An application effect is better with higher stability and better user experience.

[0046] In some other embodiments, a periphery of the lower cartridge casing **129** is wrapped by a cartridge waterproof gasket **1293**, and an outer side of the heating strip support **123** is wrapped by support silica gel **122**.

[0047] The apparatus further includes heating strip silica gel **124** for delimiting the ceramic heating strip **125**.

[0048] The cartridge assembly **12** further includes a cartridge magnet **127**. There may be one or more cartridge magnets **127**, for example, there may be two as shown in the accompanying drawings of this application, and the cartridge magnets are disposed symmetrically.

[0049] A magnet delimiting groove **1295** for embedding and accommodating the cartridge magnet **127** is provided at the inner side of the lower cartridge casing **129**.

[0050] The air pump block **16** includes an air pump accommodating groove in the middle and

connection pieces at two ends for fixed connections.

[0051] Connection holes are used for screw thread connection and fixation.

[0052] The air pump assembly **13** is accommodated in the air pump accommodating groove by snap-fit.

[0053] A snap fastener or a hook **161** for delimiting the mist outlet hose **14** and/or the air inlet hose **15** is disposed on the air pump block **16** by one-piece molding.

[0054] The snap fastener or the hook **161** is at one end of the air pump block **16** or at both ends of the air pump block **16**.

[0055] A hose groove for accommodating the hose is formed at an inner side of the snap fastener or the hook **161**.

[0056] The heating strip support **123** and the lower cartridge casing **129** are movably connected in a detachable manner.

[0057] The oil-absorbent cotton **128** is accommodated at the inner side of the lower cartridge casing **129**.

[0058] Conductive connection holes **1281** and **1291** at corresponding positions for running through the cartridge pin **126** are provided on the oil-absorbent cotton **128** and the lower cartridge casing **129**.

[0059] A plurality of snap-fit pieces **1233** are disposed by one-piece molding at an outer side of a lower part of the heating strip support **123**.

[0060] Snap-fit holes **1292** corresponding to the snap-fit pieces **1233** are provided on the lower cartridge casing **129**.

[0061] Protruding joints **1297** in joint with the air inlet hose **15** and the mist outlet hose **14** are further disposed at the bottom of the lower cartridge casing **129** by one-piece molding.

[0062] Both the air inlet hose **15** and the mist outlet hose **14** are provided with elbow connection pieces **17** at one end of the cartridge assembly **12** for connections to the protruding joints **1297**.

[0063] A silica gel groove **1234** that corresponds to the heating strip silica gel **124** and that is used to accommodate the heating strip silica gel **124** is provided at an inner side of the heating strip support **123**.

[0064] An upper part of the heating strip support **123** is protruding upwardly to form an oil supply protruding platform **1232**.

[0065] A support silica gel hole **1221**, corresponding to a position of the oil supply protruding platform **1232**, that fits into a shape of the oil supply protruding platform is provided on the support silica gel **122**.

[0066] The upper part of the heating strip support **123** is wrapped by the whole support silica gel **122**.

[0067] A technical effect achieved in this application by resolving the technical problem is as follows:

[0068] Compared with the conventional technology, according to the essential oil atomization and pumping apparatus **1** provided in the present utility model, the control circuit board **11** and the cartridge assembly **12** for essential oil atomization are disposed together, where the cartridge assembly **12** is electrically connected to the control circuit board **11**, and the cartridge assembly **12** includes the ceramic heating strip **125** for heating an atomized essential oil; the apparatus further includes the air pump assembly **13** for pumping atomized mist from a position of the cartridge assembly **12** to a position of a mist outlet at an outer side, where the air pump assembly **13** includes an air pump unit and an air pump block **16** for delimiting the air pump unit, the air pump unit is interconnected to the cartridge assembly **12** through the air inlet hose **15**, and the cartridge assembly **12** is connected to the mist outlet through a mist outlet hose **14**; the cartridge assembly **12** further includes the cartridge body **121**, the heating strip support **123** that correspondingly fits the shape of the cartridge body **121**, the lower cartridge casing **129**, the oil-absorbent cotton **128** at the inner side of the lower cartridge casing **129**, and the cartridge pin **126** for an electrically conductive connection; the heating strip support **123**, the oil-absorbent cotton

**128**, and the ceramic heating strip **125** are in the inner space surrounded by the cartridge body **121** and the lower cartridge casing **129** that fit into and connected to each other, the oil supply hole **1231** corresponding to the position of the ceramic heating strip **125** is provided at the upper part of the heating strip support **123**, and the ceramic heating strip **125** is at the inner side of the oil supply hole **1231**; and the apparatus further includes the main body pin disposed on the control circuit board **11** or electrically connected to the control circuit board **11**, where the position of the main body pin corresponds to the position of the cartridge pin **126**. In actual application, the air pump assembly **13** is used for mist pumping. An application effect is better with higher stability and better user experience.

[0069] The foregoing implementations of the present utility model do not constitute a limitation on the protection scope of the present utility model. Any modification, equivalent replacement, improvements, etc. made without departing from the spirit and principle of the present utility model shall all fall within the protection scope of the claims of the present utility model.

## Claims

1. An essential oil atomization and pumping apparatus, comprising a control circuit board and a cartridge assembly for essential oil atomization, wherein the cartridge assembly is electrically connected to the control circuit board, and the cartridge assembly comprises a ceramic heating strip for heating an atomized essential oil, wherein the apparatus further comprises an air pump assembly for pumping atomized mist from a position of the cartridge assembly to a position of a mist outlet at an outer side, wherein the air pump assembly comprises an air pump unit and an air pump block for delimiting the air pump unit, the air pump unit is interconnected to the cartridge assembly through an air inlet hose, and the cartridge assembly is connected to the mist outlet through a mist outlet hose; the cartridge assembly further comprises a cartridge body, a heating strip support that correspondingly fits a shape of the cartridge body, a lower cartridge casing, an oil-absorbent cotton at an inner side of the lower cartridge casing, and a cartridge pin for an electrically conductive connection; the heating strip support, the oil-absorbent cotton, and the ceramic heating strip are in an inner space surrounded by the cartridge body and the lower cartridge casing that fit into and connected to each other, an oil supply hole corresponding to a position of the ceramic heating strip is provided at an upper part of the heating strip support, and the ceramic heating strip is at an inner side of the oil supply hole; and the apparatus further comprises a main body pin disposed on the control circuit board or electrically connected to the control circuit board, wherein a position of the main body pin corresponds to a position of the cartridge pin.
2. The essential oil atomization and pumping apparatus according to claim 1, wherein a periphery of the lower cartridge casing is wrapped by a cartridge waterproof gasket, and an outer side of the heating strip support is wrapped by support silica gel; and the apparatus further comprises heating strip silica gel for delimiting the ceramic heating strip.
3. The essential oil atomization and pumping apparatus according to claim 1, wherein the cartridge assembly further comprises a cartridge magnet; and a magnet delimiting groove for embedding and accommodating the cartridge magnet is provided at the inner side of the lower cartridge casing.
4. The essential oil atomization and pumping apparatus according to claim 1, wherein the air pump block comprises an air pump accommodating groove in the middle and connection pieces at two ends for fixed connections; and the air pump assembly is accommodated in the air pump accommodating groove by snap-fit.
5. The essential oil atomization and pumping apparatus according to claim 4, wherein a snap fastener or a hook for delimiting the mist outlet hose and/or the air inlet hose is disposed on the air pump block by one-piece molding; the snap fastener or the hook is at one end of the air pump block or at both ends of the air pump block; and a hose groove for accommodating the hose is formed at an inner side of the snap fastener or the hook.

- 6.** The essential oil atomization and pumping apparatus according to claim 1, wherein the heating strip support and the lower cartridge casing are movably connected in a detachable manner; the oil-absorbent cotton is accommodated at the inner side of the lower cartridge casing; and conductive connection holes at corresponding positions for running through the cartridge pin are provided on the oil-absorbent cotton and the lower cartridge casing.
- 7.** The essential oil atomization and pumping apparatus according to claim 6, wherein a plurality of snap-fit pieces are disposed by one-piece molding at an outer side of a lower part of the heating strip support; and snap-fit holes corresponding to the snap-fit pieces are provided on the lower cartridge casing.
- 8.** The essential oil atomization and pumping apparatus according to claim 1, wherein protruding joints in joint with the air inlet hose and the mist outlet hose are further disposed at the bottom of the lower cartridge casing by one-piece molding; and both the air inlet hose and the mist outlet hose are provided with elbow connection pieces at one end of the cartridge assembly for connections to the protruding joints.
- 9.** The essential oil atomization and pumping apparatus according to claim 2, wherein a silica gel groove that corresponds to the heating strip silica gel and that is used to accommodate the heating strip silica gel is provided at an inner side of the heating strip support.
- 10.** The essential oil atomization and pumping apparatus according to claim 2, wherein an upper part of the heating strip support is protruding upwardly to form an oil supply protruding platform; a support silica gel hole, corresponding to a position of the oil supply protruding platform, that fits into a shape of the oil supply protruding platform is provided on the support silica gel; and the upper part of the heating strip support is wrapped by the whole support silica gel.
-