ATOMIZATION HEATING ASSEMBLY AND ATOMIZATION HEATING DEVICE USING SAME

FIELD

[0001] The invention relates to the technical field of atomization, in particular to an atomization heating assembly and an atomization heating device using the same.

BACKGROUND

[0002] As a new atomization technique emerged in recent years, the electrical heating atomization technique heats and atomizes liquid into atomized steam by means of heat energy generated by the thermal effect of resistance and has been widely applied to medical products, intelligent household appliances and consumer electronic products. The electrical heating modes include a resistance heating mode and an electromagnetic heating mode. In a case of electromagnetic induction heating, an alternating magnetic field is generated by components of an electronic circuit board, and when a magnetically conductive metal material is placed in the alternating magnetic field, alternating current and eddy current will be produced on the surface of the magnetically conductive metal material, carriers in a magnetic conductor move irregularly under the action of the eddy current to collide with atoms, and heat energy is generated by friction between the carriers and the atoms. Because resistance heating is limited by the resistance of a heating unit, the material of the heating unit is limited, and heat generated by the heating unit has a great connection with the sectional area of a conductor and other factors. The heating unit often needs to be connected to an external power supply, so heat generated by the heating unit is limited by the resistance of a product. In addition, a liquid transfer material generally needs to be attached to or inlaid in a porous material to guarantee normal use, and once the liquid transfer material is separated from the porous material by heating, the problem of drying burning of an atomization core will be easily caused by the heating unit.

SUMMARY

[0003] In view of the defects in the prior art, the technical issue to be settled by the invention is to provide an atomization heating assembly and an atomization heating device using the same. A liquid transfer unit and a heating unit which are easy to use are provided by means of the

[0036] Terms such as “upper”, “lower”, “left”, “right”, “front”, “back”, “vertical”, “horizontal”, “top”, “bottom”, “inner” and “outer” are used to indicate directions or positions based on the accompanying drawings.

[0037] The term “axial” refers to a length direction of a whole device or component, and the term “radial” refers to a direction perpendicular to the axial direction.

[0038] Terms such as “first” and “second” are merely for the purpose facilitating description, and should not be construed as indicating or implying relative importance or implicitly indicating the number of technical features referred to. Unless otherwise expressly defined, “multiple” means two or more.

[0039] The above terms are merely for facilitating description, and should not be construed as limitations of the technical solutions of the invention.

[0040] Embodiment 1: As shown in FIGS. 1-7, an atomization heating assembly comprises a porous liquid transfer unit 100 and a magnetically conductive porous heating unit 200. Wherein, the porous liquid transfer unit 100 is configured as a porous structure with micron-sized pores formed by high-temperature sintering of an inorganic non-metallic aggregate and a binder. The micron-sized pores formed after high-temperature sintering of the inorganic non-metallic aggregate and the binder can provide passages allowing liquid to be atomized to flow through, and the porous liquid transfer unit 100 with high strength can provide a structural support and has heat insulation effects. The magnetically conductive porous heating unit 200 is configured as a magnetically conductive porous structure formed by direct high-temperature sintering of magnetically conductive material particles or by high-temperature sintering of magnetically conductive material particles and a binder. That is, the magnetically conductive porous structure may be achieved by direct high-temperature sintering of magnetically conductive material particles or by high-temperature sintering of magnetically conductive material particles and a binder, and micron-sized micropores are formed in both cases. The magnetically conductive structure formed in this way not only can generate heat by electromagnetic induction, but also can fulfil a liquid transfer function by means of the micron-sized micropores. The magnetically conductive porous heating unit 200 is at least inlaid in or attached to a surface of the porous liquid transfer unit 100. It can be understood that

in this case, the liquid inflow surface 11 arranged on the porous liquid transfer unit 100 is configured as a curved structure, and correspondingly, the magnetically conductive porous heating unit 200 is configured as a cylindrical structure inlaid in or attached to the middle of an inner wall of the porous liquid transfer unit 100 or is configured as a cylindrical structure attached to or inlaid in the middle of an outer wall of the porous liquid transfer unit 100, and the atomization surface 21 is configured as a curved structure. Or, as shown in FIG. 2, the porous liquid transfer unit 100 may be configured as a grooved structure. It can be understood that the porous liquid transfer unit 100 is provided with a liquid transfer groove 13. In this case, the liquid inflow surface 11 arranged on the porous liquid transfer unit 100 is configured as a groove surface structure, and correspondingly, the magnetically conductive porous heating unit 200 is inlaid in or attached to the porous liquid transfer unit 100 corresponding to the liquid transfer groove. Or, as shown in FIG. 7, the porous liquid transfer unit 100 may be configured as bowl-shaped structure, and correspondingly, the magnetically conductive porous heating unit 200 is inlaid in or attached to the bottom or outer wall of the bowl-shaped porous liquid transfer unit 100. The liquid inflow surface 11 arranged on the porous liquid transfer unit 100 may be a flat surface, a curved surface, even a groove surface, or other structures, which is not specifically limited here. The atomization surface 21 may be a flat surface, a curved surface, an inclined surface, or a combination thereof, which is not specifically limited here and can be designed as actually needed.

[0048] As shown in FIG. 1-FIG. 2, a liquid transfer hole 12 or a liquid transfer groove 13 may be formed in the liquid inflow surface 11 of the porous liquid transfer unit 100 to realize a better liquid inflow effect. The design of the liquid transfer groove 13 or/and the liquid transfer hole 12 is especially important for the porous liquid transfer unit and can enlarge the surface area of the liquid inflow surface 11 of the porous liquid transfer unit 100, thus facilitating control of the liquid inflow rate and improving the liquid inflow stability. Particularly in some cases where the liquid inflow surface 11 of the porous liquid transfer body 100 is arranged obliquely and has liquid hold time shorter than that of the planar or bowl-shaped liquid inflow surface, the addition of the liquid transfer groove 13 or/and the liquid transfer hole 12 can improve the liquid inflow efficiency and stability.

[0049] A preparation method of the atomization heating assembly comprises: preparing porous liquid transfer unit slurry from an inorganic non-metallic aggregate and a binder, preparing magnetically conductive porous heating unit slurry from magnetically conductive material particles or magnetically conductive material particles and a binder, performing hot pressing injection molding on the magnetically conductive porous heating unit slurry with a mold to obtain the magnetically conductive porous heating unit 200, after the magnetically conductive porous heating unit 200 is cooled and fixed, injecting the porous liquid transfer unit slurry to obtain an atomization heating assembly blank material by molding, and sintering the atomization heating assembly blank material at a high temperature in a high-temperature sintering furnace to obtain the atomization heating assembly.

[0050] Common materials of the inorganic non-metallic aggregate include molten quartz sand, diatomite, talc, zeolite, sepiolite, maifanite, cordierite, silicon oxide, zirconia and other high-temperature refractory ceramic powders, and the binder is a glass powder or a glaze and has a melting point of 600-1300℃.

[0051] The magnetically conductive porous heating unit 200 is prepared from the following raw materials: 50-100 parts of a magnetically conductive metal powder, 0-30 parts of a ceramic powder, 0-40 parts of a sintering aid, and 0-30 parts of paraffin. The magnetically conductive metal powder is at least one of pure iron, low-carbon steel, iron-aluminum alloy, iron-silicon alloy, iron-nickel alloy, iron-cobalt alloy, ferrite, metallic nickel and metallic cobalt, which have good stability with the frequency change of the initial magnetic permeability, and have good magnetic induction and high magnetic permeability. It can be understood that the magnetically conductive metal powder may be any one of these metal powders, or a combination of any two or more of these metal powders. The magnetically conductive porous heating unit 200 is prepared by: mixing a plurality of parts of the magnetically conductive metal powder, a plurality of parts of the ceramic powder, a plurality of parts of the sintering aid, and a plurality of parts of the paraffin, and sintering the raw materials at a high sintering temperature of 600-1300℃ to form a magnetically conductive porous structure. Some specific embodiments and performance test results are shown in the table below:

What is claimed is:

1. An atomization heating assembly, characterized by comprising a porous liquid transfer unit (100) and a magnetically conductive porous heating unit (200), wherein the porous liquid transfer unit (100) is configured as a porous structure with micron-sized pores formed by high-temperature sintering of an inorganic non-metallic aggregate and a binder, the magnetically conductive porous heating unit (200) is configured as a magnetically conductive porous structure formed by direct high-temperature sintering of magnetically conductive material particles or by high-temperature sintering of the magnetically conductive material particles and the binder, the magnetically conductive porous heating unit (200) is at least inlaid in or attached to a surface of the porous liquid transfer unit (100), and an exposed surface of the magnetically conductive porous heating unit (200) located in an atomization passage forms an atomization surface (21).

2. The atomization heating assembly according to Claim 1, characterized in that the magnetically conductive porous heating unit (200) is prepared from the following raw materials: 50-100 parts of a magnetically conductive metal powder, 0-30 parts of a ceramic powder, 0-40 parts of a sintering aid, and 0-30 parts of paraffin.

3. The atomization heating assembly according to Claim 2, characterized in that the magnetically conductive metal powder is at least one of pure iron, low-carbon steel, iron-aluminum alloy, iron-silicon alloy, iron-nickel alloy, iron-cobalt alloy, ferrite, metallic nickel, and metallic cobalt.

4. The atomization heating assembly according to Claim 1, characterized in that the binder is a glass powder or a glaze, and has a melting point of 600-1300℃.

5. The atomization heating assembly according to Claim 1, characterized in that a portion, in contact with a sealing element, of the surface of the porous liquid transfer unit (100) is not provided with the magnetically conductive porous heating unit (200).

6. The atomization heating assembly according to Claim 1, characterized in that a thickness of the porous liquid transfer unit (100) is greater than that of the magnetically conductive porous heating unit (200).

7. The atomization heating assembly according to Claim 1, characterized in that a thickness of a portion, provided with the atomization surface (21), of the magnetically

conductive porous heating unit (200) is greater than that of other portions of the magnetically conductive porous heating unit (200).

8. The atomization heating assembly according to Claim 1, characterized in that an air guide member (300) configured to guide air and enlarge the atomization area is arranged on the atomization surface (21) of the magnetically conductive porous heating unit (200) in an airflow direction.

9. The atomization heating assembly according to Claim 8, characterized in that multiple columns of said air guide members (300) are arranged in the airflow direction, and gaps are reserved between the multiple columns of said air guide members (300).

10. The atomization heating assembly according to Claim 9, characterized in that in the airflow direction, the air guide members (300) in a same column are arranged discontinuously or continuously.

11. The atomization heating assembly according to Claim 9, characterized in that the air guide member (300) is arranged in parallel, radially, or in a staggered manner.

12. The atomization heating assembly according to any one of Claims 8-11, characterized in that a cross-section of the air guide member (300) is in a polygonal shape, a curved shape or a combination thereof.

13. The atomization heating assembly according to any one of Claims 8-11, characterized in that the air guide member (300) is at least one of an air guide groove, an air guide rib, and an air guide protrusion.

14. The atomization heating assembly according to Claim 1, characterized in that the porous liquid transfer unit (100) is configured as a plate structure, a bowl-shaped structure, a grooved structure or a cylindrical structure;

the magnetically conductive porous heating unit (200) is configured as a plate structure inlaid in a middle of a side wall of the porous liquid transfer unit (100), or the magnetically conductive porous heating unit (200) configured as a cylindrical structure inlaid in a middle of an inner wall or an outer wall of the porous liquid transfer unit (100);

the atomization surface (21) of the magnetically conductive porous heating unit (200) extends out of a side surface of the porous liquid transfer unit (100) or is flush with the side surface of the porous liquid transfer unit (100).

15. The atomization heating assembly according to Claim 14, characterized in that a liquid inflow surface (11) arranged on the porous liquid transfer unit (100) is at least one of a flat surface, a curved surface and a groove surface, and the atomization surface (21) is at least one of a flat surface and a curved surface.

16. The atomization heating assembly according to Claim 1, characterized in that a liquid transfer hole (12) or a liquid transfer groove (13) is formed in a liquid inflow surface (11) of the porous liquid transfer unit (100).

17. An atomization heating device, comprising a housing (10), a mouthpiece (20) and a liquid tank (30), characterized in that the atomization heating assembly according to any one of Claims 1-16 is arranged below the liquid tank (30), and a sealing element (50) is arranged between the atomization heating assembly and the liquid tank (30).