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(54) **ELECTROSTATIC SPRAY DEVICE**

ELEKTROSTATISCHE SPRÜHVORRICHTUNG

DISPOSITIF DE PULVÉRISATION ÉLECTROSTATIQUE

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Description

Technical Field

[0001] The present invention relates to an electrostatic spray device, particularly an electrostatic spray device that sprays liquid containing a functional component into a mist, using a potential difference between a porous electrode and a ground ring.

Background Art

[0002] In general, electrostatic spray devices, which are spray devices that can spray liquid, are devices spraying liquid by applying high voltage to an electrode and a charged electrode.

[0003] The electrostatic spray devices may include a container keeping liquid, an electrode sucking liquid from the container, a ground electrode for generating a potential difference from the electrode, and a high-voltage power applying high voltage to between the electrode and the ground electrode.

[0004] In the electrostatic spray devices, liquid can be absorbed to the electrode by the capillary phenomenon, and when high voltage is applied from the high-voltage power, an electric force larger than the surface tension of the liquid is generated and the drops of the liquid are atomized and split into a mist by the potential difference between the electrode and the ground electrode, such that the liquid can be sprayed.

Disclosure of Invention

Technical Problem

[0005] The electrostatic spray devices can keep liquid with various electric conductivities in the container, but there is a problem in that when the container is filled with a functional liquid with low electric conductivity, electric charge separation by an electric force is difficult, so drops of the liquid is difficult to atomize and the spraying ability may be low.

[0006] An object of the present invention is to provide an electrostatic spray device that easily separates electric charges with an electric force and has high spraying ability, even though function liquid has low electric conductivity.

[0007] JP 2006 122758 A an electrostatic atomization apparatus is provided. The electrostatic atomization apparatus includes a liquid storing part for housing the liquid to be atomized, an electrode for applying voltage to the liquid, the transportation part, in which one end is made in contact with the liquid in the liquid storing part and another end is sharpened to form a sharpened part being the atomization part, a counter electrode opposed to the atomization part of the transportation part and a voltage impressing part for impressing the voltage between the transportation part and the counter electrode to electro-

statically atomize the liquid sucked from the liquid storing part by the transportation part at the atomization part, a hole from one end or the transportation part to another end of the sharpened part of the atomization part is provided in the transportation part.

[0008] WO 2013/065280 A1 discloses an electrostatic atomizer comprising a tank, a spray nozzle, which is attached to the tank, a transport unit, that transports a liquid for spraying inside the tank to a leading end of the spray nozzle, a counter electrode that is exposed on an outer surface, and an electrical field forming mechanism, that forms an electrical field between the counter electrode and the leading end of the spray nozzle by the application of voltage to the liquid for spraying.

[0009] US 2010/0314460 A1 discloses a method for delivering an aerosol, especially an aromatic aerosol and an apparatus to perform such a method.

[0010] WO2004054627 describes aroma dispensing device comprising a housing having a dispensing outlet and contains: a liquid supplier for supplying liquid containing at least one volatile component to a liquid outlet; an electric field provider for causing liquid issuing from the liquid outlet to provide electrically charged droplets from which at least a part of the at least one volatile component evaporates to produce vapour; a collection receptacle for collecting electrically charged droplets to inhibit the electrically charged droplets from passing through the dispensing outlet; an attraction electrode for attracting electrically charged droplets into the collection receptacle; and a flow director for directing vapour away from the collection receptacle and towards the dispensing outlet.

Solution to Problem

[0011] The object is solved by the features of the independent claim. Preferred embodiments are given in the dependent claims.

[0012] Preferably, an electrostatic spray device includes: a container that is filled with a functional liquid; a porous electrode that is disposed in the container and through which the functional liquid is moved up by the capillary phenomenon; a ground ring that generates a potential different from the porous electrode; and a high voltage applying terminal that applies high voltage generated by a high voltage generator to the functional liquid, in which the high voltage applying terminal has a pointed end at the lower portion.

[0013] Preferably, an electrode spray device includes: an electrode spray capsule spraying a functional liquid; a housing having an entrance through which the electrostatic spray capsule is put inside/outside; an electrode spray capsule holder that is formed in the housing and to/from which the electrode spray capsule is attached/detached; and a high voltage generator disposed in the housing, in which the electrode spray capsule includes: a container that is filled with the functional liquid; a porous electrode that is disposed in the container, through which

the functional liquid is moved up by the capillary phenomenon, and which has a pointed end; a ground ring that generates a potential different from the porous electrode; and a high voltage applying terminal that applies high voltage generated by a high voltage generator to the functional liquid, and the high voltage applying terminal has a pointed end at the lower portion.

[0014] The pointed end may face a bottom plate of the container.

[0015] The pointed end may be spaced from a bottom plate of the container.

[0016] The high voltage applying terminal may have an inner terminal portion disposed in the container and having the pointed end.

[0017] The inner terminal portion may be disposed in parallel with the porous electrode.

[0018] The high voltage applying terminal may further have a container-through portion passing through the container and an outer terminal portion disposed outside the container.

[0019] The height of the inner terminal portion may be larger than the height of the outer terminal portion.

[0020] An electrode supporter supporting the lower portion of the porous electrode is formed in the container.

[0021] The pointed end may be spaced from the bottom plate of the container and a gap between the pointed end and the bottom plate of the container is lower than the height of the electrode supporter.

Advantageous Effects of Invention

[0022] According to the present invention, since an electric field concentrates on the pointed end of the high voltage applying terminal, charge separation by an electric force is easy and spraying ability can be increased.

[0023] Further, it is possible to spray a functional liquid, using a potential difference, after charging the fluid by forcibly applying charges into the functional spray.

[0024] Further, it is possible to efficiently spray the functional liquid, even if the amount of the functional liquid decreases.

[0025] Further, it is possible to mount the device on a vehicle or an air conditioner such as an air purifier and to reduce the size.

Brief Description of Drawings

[0026]

FIG. 1 is a perspective view showing an embodiment of an electrostatic spray device according to the present invention.

FIG. 2 is a cross-sectional view taken along line A-A of FIG. 1.

FIG. 3 is a cross-sectional view taken along the line B-B of FIG. 1.

FIG. 4 is an enlarged perspective view showing a ground ring of an embodiment of an electrostatic

spray device according to the present invention.

FIG. 5 is an enlarged perspective view showing a high voltage applying terminal of an embodiment of an electrostatic spray device according to the present invention.

FIG. 6 is a perspective view when an electric spray capsule of an embodiment of an electrostatic spray device according to the present invention is mounted on an electric spray capsule holder.

FIG. 7 is a perspective view when the electric spray capsule of an embodiment of an electrostatic spray device according to the present invention is separated from the electric spray capsule holder.

Best Mode for Carrying out the Invention

[0027] Hereinafter, embodiments of the present invention will be described in detail with reference to the accompanying drawings.

[0028] FIG. 1 is a perspective view showing an embodiment of an electrostatic spray device according to the present invention, FIG. 2 is a cross-sectional view taken along line A-A of FIG. 1, FIG. 3 is a cross-sectional view taken along the line B-B of FIG. 1, FIG. 4 is an enlarged perspective view showing a ground ring of an embodiment of an electrostatic spray device according to the present invention, and FIG. 5 is an enlarged perspective view showing a high voltage applying terminal of an embodiment of an electrostatic spray device according to the present invention.

[0029] An electrostatic spray device of the present embodiment includes; a container 2 that is filled with a functional liquid A; a porous electrode 4 that is disposed in the container 2 and through which the functional liquid A is moved up by the capillary phenomenon; a ground ring 6 that generates a potential different from the porous electrode 4; and a high voltage applying terminal 10 that applies high voltage generated by a high voltage generator (not shown) to the functional liquid A.

[0030] The functional liquid A is available for specific purposes, for example, activating the brain activity of a human body and can be put in the container 2 in a liquid state. The functional liquid A may be an aroma oil such as a rosemary aroma oil, a peppermint aroma oil, a lemon aroma oil, and a basil aroma oil. The electric conductivity of the electrostatic spray device may depend on the type of the functional liquid A and the container 2 may be filled with a substance with low electric conductivity.

[0031] An electrode supporter 11 supporting the porous electrode 4 may be formed in the container 2. A ground ring hole 12 through which the ground ring 6 passes may be formed in the container 2. A high voltage applying terminal hole 13 through which the high voltage applying terminal 10 passes may be formed at the container 2. A discharge hole 14 through which a mist produced in the container 2 is discharged may be formed at the container 2. The discharge hole 14 may be formed such that the open area of the top is larger than the open

area of the bottom. The discharge hole 14 may be formed such that the area gradually increases, as it goes to the top. The discharge hole 14 may be formed in a cone shape. The discharge hole 14 may enable the functional liquid A to easily flow into the container 2, when the functional liquid A flows inside from the outside.

[0032] The container 2 may include a body 15 of which the top is open and which has a space for keeping the functional liquid A therein, and a cover 16 covering the top of the body 15.

[0033] In the container 2, the electrode supporter 11, the ground ring hole 12, and the high voltage applying terminal hole 13 may be formed at the body 15 and the discharge hole 14 may be formed at the cover 16.

[0034] The body 15 may include a hollow tub 17 and a bottom plate 18 blocking the bottom of the hollow tub 17.

[0035] The electrode supporter 11 can be formed in the container 2 to support the lower portion of the porous electrode 4. The electrode supporter 11 may protrude integrally from the container 2, in the container 2. The electrode supporter 11 may be formed on the body 15. The electrode supporter 11 may protrude upward on the upper surface of the bottom plate 18. A plurality of electrode supporters 11 may be formed at predetermined distances from each other and the functional liquid A can flow to the porous electrode A through gaps between the electrode supporters 11.

[0036] The ground ring hole 12 may be formed at the hollow tub 17 at a predetermined distance from the high voltage applying terminal hole 13. At least one ground ring hole 12 may be formed at the hollow tub 17 and two may be formed to face each other.

[0037] The high voltage applying terminal hole 13 may be formed at the hollow tub 17. The high voltage applying terminal hole 13 and the ground ring hole 12 may be formed at different heights H1 and H2 at the hollow tub 17. The height H1 of the high voltage applying terminal hole 13 from the bottom plate 18 may be smaller than the height H2 of the ground ring hole 12 from the bottom plate 18.

[0038] The cover 16 may be formed in a cylinder shape with the bottom open. The discharge hole 14 may be formed in the cover 16 and may be positioned over the porous electrode 4. The discharge hole 14 may be sized such that the portion of the ground ring 6 which is positioned inside the container 2 is not seen through the discharge hole 14, when the body 15 is covered with the cover 16. The cover 16 may be composed of a top plate 16A and a hollow cylinder 16B. The discharge hole 14 may be formed in the top plate 16A of the cover 16. The hollow cylinder 16B of the cover 16 may surround a portion of the hollow tub 17 of the body 15. The hollow cylinder 16B of the cover 16 may surround vertical protrusions 66 of the ground ring 6, which is described below. Through-grooves 16C through which exposed terminal portions 67 of the ground ring 6, which are described below, pass are formed in the hollow cylinder 16B of the cover 16.

[0039] The porous electrode 4 may be disposed inside the container 2. In the porous electrode 4, the lower portion may be fixed to the container 2 and the upper portion may be disposed close to the ground ring 6. The electrostatic spray device performs spraying, using a potential difference between the porous electrode 4 and the ground ring 6.

[0040] The porous electrode 4 may be made of a non-conductive material such as polyester, acryl, and carbon fiber. The liquid-state functional liquid A in the container 2 may be moved to the upper portion of the porous electrode 4 by the capillary phenomenon. Electrostatic spray has various spray modes, but cone-jet mode spray having a cone shape is the most stable. On the other hand, when the functional liquid A is a nonpolar liquid, it is difficult to form cone-jet due to low electric conductivity, so it is possible to induce stable spray of nonpolar liquid by artificially making the top in a cone type. The porous electrode 4 may be formed in a needle shape vertically long and the upper portion of the porous electrode 4 may be pointed in a cone shape. That is, the porous electrode 4 may have a pointed top 42. The porous electrode 4 can generate a strong electric field at the pointed top 42, when high voltage is applied, and monopole charges produced in this case permeate into the functional liquid A, thereby facilitating monopole charging.

[0041] The ground ring 6 may have a ring portion 62 and protrusions 64 protruding from the ring portion 62. The inner diameter D1 of the ring portion 62 may be larger than the diameter D2 of the discharge hole 14. The diameter D2 of the discharge hole 14 may be the diameter of the portion with the largest diameter and the inner diameter D1 of the ring portion 62 may be larger than the diameter of the portion with the largest diameter D2 in the discharge hole 14. The protrusion 64 may have a horizontal protrusion 65 protruding from the ring portion 62 and a vertical protrusion 66 protruding vertically from the horizontal protrusion 65. The horizontal protrusion 65 may protrude radially from the ring portion 62. The vertical protrusion 66 may protrude downward from the horizontal protrusion 65. The ground ring 6 may further have the exposed terminal portion 67 that is exposed to the outside of the container 2, when the ground ring is mounted on the container 2. The exposed terminal portion 67 may protrude from the protrusion 64, especially from the lower portion of the vertical protrusion 66.

[0042] The high voltage applying terminal 10 contributes to charging the functional liquid A and generating a potential difference between the porous electrode 4 and the ground ring 6. The functional liquid A may have considerably low electric conductivity such as an aroma oil, in which when an electric force is applied by high voltage, charge separation by free electric charges is difficult and there is a limit in atomizing and spraying liquid drops. It is preferable that the high voltage applying terminal 10 has a shape capable of efficiently spraying the functional liquid A with low electric conductivity. The high voltage applying terminal 10 may have a pointed end 102 at the

lower end. The pointed end 102 may be formed such that the cross-sectional area gradually decreases. The pointed end 102 may face the bottom plate 18 of the container 2. The pointed end 102 may be spaced from the bottom plate 18 of the container 2. The gap G between the pointed end 102 and the bottom plate 18 of the container 2 may be lower than the height H3 of the electrode supporter 11.

[0043] The high voltage applying terminal 10 may have an inner terminal portion 104 disposed in the container 2 and having the pointed end 102. The high voltage applying terminal 10 may further have a container-through portion 106 passing through the container 2 and an outer terminal portion 108 disposed outside the container 2.

[0044] The inner terminal portion 104 may be disposed in parallel with the porous electrode 4. The inner terminal portion 104 may be vertically elongated in the container 2. The pointed end 102 that is the lower end of the inner terminal portion 104 may be spaced from the bottom plate 18 of the container 2 not to be in contact with the bottom plate 18 of the container 2. The pointed end 102 of the high voltage applying terminal 10 may be pointed in the opposite direction to the pointed top end 42 of the porous electrode 4.

[0045] The container-through portion 106 enables the high voltage applying terminal can be disposed through the through-hole 13. The container-through portion 106 may be horizontally formed at the top of the inner terminal portion 104.

[0046] The outer terminal portion 108 may be formed vertically downward from the container-through portion 106. At least a portion of the outer terminal portion 108 may be exposed to the outside of the container 2. The height H4 of the inner terminal portion 108 may be larger than the height H5 of the outer terminal portion 108. The outer terminal portion 108 may further have an exposed terminal portion 109 that is exposed to the outside of the container 2, when the outer terminal portion 108 is mounted on the container 2. The exposed terminal portion 109 may be formed at the lower portion of the outer terminal portion 108.

[0047] In the electrostatic spray device, when the pointed end 102 is not formed at the high voltage applying terminal 10, the diameter of the particles of the mist produced from the functional liquid having low electric conductivity may be in the range of 0~50 μm , but when the pointed end 102 is formed at the high voltage applying terminal 10, the diameter of the particles of the mist produced from the functional liquid having low electric conductivity may be in the range of 0~20 μm , about 0~10 μm .

[0048] In the electrostatic spray device, the container 2, the porous electrode 4, the ground ring 6, and the high voltage applying terminal 10 may constitute an electrostatic spray capsule 110. The electrostatic spray device may further include an electrostatic spray capsule holder to/from which the electrostatic spray capsule 110 is attached/detached.

[0049] FIG. 6 is a perspective view when an electric

spray capsule of an embodiment of an electrostatic spray device according to the present invention is mounted on an electric spray capsule holder and FIG. 7 is a perspective view when the electric spray capsule of an embodiment of an electrostatic spray device according to the present invention is separated from the electric spray capsule holder.

[0050] The electrostatic spray device may include housing 120 having an entrance 118 through which the electrostatic spray capsule 110 is put inside/outside, an electrostatic spray capsule holder 130 that is formed in the housing 120 and to/from which the electrostatic spray capsule 110 is attached/detached, and a high voltage generator 140 disposed in the housing 120.

[0051] The housing 120 may include an upper housing 122 protecting the electrostatic spray capsule holder 130 and a lower housing 124 protecting the high voltage generator 140. The upper housing 122 may be formed larger than the electrostatic spray capsule holder 130. The upper housing 122 may have the entrance 118 at the top 123. The upper housing 122 may be disposed on the lower housing 124. The upper housing 122 may be combined with the lower housing 124 by locking members such as hooks or by fasteners such as screws. The entrance 118 may be vertically open through the top 123 of the upper housing 122. The entrance 118 may be formed smaller in area than the electrostatic spray capsule holder and larger in area than the electrostatic spray capsule 110. The electrostatic spray capsule 110 can be inserted into the electrostatic spray capsule holder 130 through the entrance 118 from above the entrance 118 and seated in the electrostatic spray capsule holder 130. The lower housing 124 may be formed larger than the high voltage generator 140. The housing 120 may further include a separator 126 dividing its inside up and down. The electrostatic spray capsule holder 130 may be disposed on the separator 126 and the high voltage generator 140 may be disposed under the separator 126.

[0052] The electrostatic spray capsule holder 130 can be formed separately from the housing 120 and then disposed in the housing 120 or may be integrally formed with the housing 120, when the housing 120 is manufactured. The electrostatic spray capsule holder 130 may be an electrostatic spray capsule receiving unit in which the electrostatic spray capsule 110 is inserted and received.

[0053] The electrostatic spray capsule holder 130 may be formed such that two sides facing each other in four of the front, rear, left, and right sides are closed and an opening is formed the other sides. For example, when the left side and the right side of the electrostatic spray capsule holder 130 are closed, and an opening may be formed at the front side of the electrostatic spray capsule holder 130 and the rear side of the electrostatic spray capsule holder 130. In contrast, when the front side and the rear side of the electrostatic spray capsule holder 130 are closed, and an opening may be formed at the left side of the electrostatic spray capsule holder 130 and

the right side of the electrostatic spray capsule holder 130. A user or a worker (hereafter, referred to as a user) can put fingers into the openings to attach/detach the electrostatic spray capsule 110 and can easily attach/detach the electrostatic spray capsule 110.

[0054] The high voltage generator 140 can be electrically connected with the electrostatic spray capsule 110 through a separate connection terminal and can be electrically connected with the electrostatic spray capsule 110 through a lead wire. It is preferable that the high voltage generator 140 can generate high voltage of 6~8 kv and then directly apply it to the electrostatic spray capsule 110 or to a connection terminal to be described below, for stable spraying.

[0055] The electrostatic spray capsule holder 130 may have a connection terminal that is electrically connected with the high voltage generator 140 and transmits high voltage generator to the electrostatic spray capsule 110.

[0056] The connection terminal may include a ground ring connection terminal 132, which comes in contact with the ground ring 6, when the electrostatic spray capsule 110 is mounted on the electrostatic spray capsule holder 130. The ground ring connection terminal 132 may come in contact with the exposed terminal portion 67 of the ground ring 6.

[0057] The connection terminal may include a high voltage applying terminal connection terminal 134, which comes in contact with the high voltage applying terminal 10, when the electrostatic spray capsule 110 is mounted on the electrostatic spray capsule holder 130. The high voltage applying terminal connection terminal 134 may come in contact with the exposed terminal portion 109 of the high voltage applying terminal 10. The high voltage generator 140 can be connected with the ground ring connection terminal 132 by a lead wire. The high voltage generator 140 can be connected with the high voltage applying terminal connection terminal 134 by a lead wire.

[0058] The electrostatic spray device may be installed in an air conditioner such as an air purifier, a cooler, and a heater to be used and the electrostatic spray capsule 10 may be replaced or serviced. The electrostatic spray device may be installed with the housing 120 fixed or movable to an air conditioner such as an air purifier, a cooler, and a heater or a vehicle, and the electrostatic spray capsule 110 can be mounted on the electrostatic spray capsule holder 130 to be used. When the functional liquid A is exhausted, a user can reuse the electrostatic spray capsule 110 by separating the electrostatic spray capsule 110 from the electrostatic spray capsule holder 130 and refilling it with the functional liquid A. Further, a user can mount and use another electrostatic spray capsule having a different type of functional liquid and the same structure on the electrostatic spray capsule holder 130.

[0059] Hereinafter, the operation of the present invention having the configuration is described.

[0060] First, the functional liquid A in the container 2 is moved up to the top of the porous electrode 4 by the

capillary phenomenon.

[0061] When the high voltage generator 140 is turned on and generates high voltage, the high voltage can be applied to the electrostatic spray capsule 110 through the high voltage applying terminal connection terminal 134 or directly to the electrostatic spray capsule 110.

[0062] The high voltage can be applied to the high voltage applying terminal 10 and an electric field may concentrate on the pointed end 102. Electric charges may concentrate on the pointed end 102 of the high voltage applying terminal 10 and charge separation by free electric charges may be easy.

[0063] Further, a potential difference is generated between the porous electrode 4 and the ground ring 3 by the high voltage from the high voltage applying terminal 10 and the drops of the functional liquid A is atomized and split into a mist M by an electric field due to the potential difference, thereby spraying the functional liquid A.

Claims

1. An electrostatic spray device comprising:

a container (2) that is filled with a functional liquid;
a porous electrode (4) that is disposed in the container (2) and through which the functional liquid is moved up by the capillary phenomenon,
a ground ring (6) that generates a potential different from the porous electrode (4);
a high voltage applying terminal (10) that applies high voltage generated by a high voltage generator to the functional liquid, **characterized in that** an electrode supporter (11) supporting the lower portion of the porous electrode (4) is formed in the container (2), and the high voltage applying terminal (10) has a pointed end (102) at its lower portion, and the pointed end (102) is spaced from a bottom plate (18) of the container (2) and a gap between the pointed end (102) and the bottom plate (18) of the container (2) is lower than the height of the electrode supporter (11).

2. The electrostatic spray device of claim 1, wherein the pointed end (102) faces the bottom plate (18) of the container (2).

3. The electrostatic spray device of claim 1, wherein the pointed end (102) is spaced from the bottom plate (18) of the container (2).

4. The electrostatic spray device of claim 1, wherein the high voltage applying terminal (10) has an inner terminal portion (104) disposed in the container (2) and having the pointed end (102).

5. The electrostatic spray device of claim 4, wherein the inner terminal portion (104) is disposed in parallel with the porous electrode (4).
6. The electrostatic spray device of claim 4, wherein the high voltage applying terminal (10) further has a container-through portion (106) passing through the container (2) and an outer terminal portion (108) disposed outside the container (2).
7. The electrostatic spray device of claim 6, wherein the height of the inner terminal portion (104) is larger than the height of the outer terminal portion (108).

Patentansprüche

1. Elektrostatische Sprühvorrichtung, umfassend:

einen Behälter (2), der mit einer funktionellen Flüssigkeit gefüllt ist;
 eine poröse Elektrode (4), die in dem Behälter (2) angeordnet ist und durch welche die funktionelle Flüssigkeit durch das Kapillarphänomen nach oben bewegt wird,
 einen Massering (6), der ein Potential erzeugt, das sich von der porösen Elektrode (4) unterscheidet;
 eine eine Hochspannung anlegende Klemme (10), die eine Hochspannung, die von einem Hochspannungsgenerator erzeugt wird, auf die funktionelle Flüssigkeit anlegt,
dadurch gekennzeichnet, dass eine Elektrodenabstützung (11), die den unteren Abschnitt der porösen Elektrode (4) abstützt, im Behälter (2) gebildet ist, und dass die eine Hochspannung anlegende Klemme (10) ein spitzes Ende (102) an ihrem unteren Abschnitt aufweist, und dass das spitze Ende (102) von einer unteren Platte (18) des Behälters (2) beabstandet ist und ein Spalt zwischen dem spitzen Ende (102) und der unteren Platte (18) des Behälters (2) niedriger ist als die Höhe der Elektrodenabstützung (11).

2. Elektrostatische Sprühvorrichtung nach Anspruch 1, wobei das spitze Ende (102) der unteren Platte (18) des Behälters (2) zugewandt ist.
3. Elektrostatische Sprühvorrichtung nach Anspruch 1, wobei das spitze Ende (102) von der unteren Platte (18) des Behälters (2) beabstandet ist.
4. Elektrostatische Sprühvorrichtung nach Anspruch 1, wobei die eine Hochspannung anlegende Klemme (10) einen inneren Klemmenabschnitt (104) aufweist, der in dem Behälter (2) angeordnet ist und das spitze Ende (102) aufweist.

5. Elektrostatische Sprühvorrichtung nach Anspruch 4, wobei der innere Klemmenabschnitt (104) parallel zur porösen Elektrode (4) angeordnet ist.
6. Elektrostatische Sprühvorrichtung nach Anspruch 4, wobei die eine Hochspannung anlegende Klemme (10) ferner einen Behälter-Durchtrittsabschnitt (106) aufweist, der durch den Behälter (2) verläuft, und einen äußeren Klemmenabschnitt (108), der außerhalb des Behälters (2) angeordnet ist.
7. Elektrostatische Sprühvorrichtung nach Anspruch 6, wobei die Höhe des inneren Klemmenabschnitts (104) größer als die Höhe des äußeren Klemmenabschnitts (108) ist.

Revendications

1. Dispositif de pulvérisation électrostatique comportant :

un récipient (2) qui est rempli d'un liquide fonctionnel ;
 une électrode poreuse (4) qui est disposée dans le récipient (2) et à travers laquelle le liquide fonctionnel est déplacé vers le haut par le phénomène capillaire,
 une bague de masse (6) qui génère un potentiel différent de l'électrode poreuse (4) ;
 une borne d'application de tension élevée (10) qui applique au liquide fonctionnel une tension élevée générée par un générateur de tension élevée,
caractérisé en ce qu'un élément de support d'électrode (11) supportant la partie inférieure de l'électrode poreuse (4) est formé dans le récipient (2) et la borne d'application de tension élevée (10) a une extrémité pointue (102) sur sa partie inférieure, et l'extrémité pointue (102) est espacée d'une plaque de fond (18) du récipient (2) et un espace entre l'extrémité pointue (102) et la plaque de fond (18) du récipient (2) est inférieur à la hauteur de l'élément de support d'électrode (11).

2. Dispositif de pulvérisation électrostatique selon la revendication 1, dans lequel l'extrémité pointue (102) est dirigée vers la plaque de fond (18) du récipient (2).
3. Dispositif de pulvérisation électrostatique selon la revendication 1, dans lequel l'extrémité pointue (102) est espacée de la plaque de fond (18) du récipient (2).
4. Dispositif de pulvérisation électrostatique selon la revendication 1, dans lequel la borne d'application de

tension élevée (10) a une partie de borne intérieure (104) disposée dans le récipient (2) et ayant l'extrémité pointue (102).

5. Dispositif de pulvérisation électrostatique selon la revendication 4, dans lequel la partie de borne intérieure (104) est disposée parallèlement à l'électrode poreuse (4) 5
6. Dispositif de pulvérisation électrostatique selon la revendication 4, dans lequel la borne d'application de tension élevée (10) a en outre une partie traversante de récipient (106) passant à travers le récipient (2) et une partie de borne extérieure (108) disposée à l'extérieur du récipient (2). 10 15
7. Dispositif de pulvérisation électrostatique selon la revendication 6, dans lequel la hauteur de la partie de borne intérieure (104) est plus grande que la hauteur de la partie de borne extérieure (108). 20

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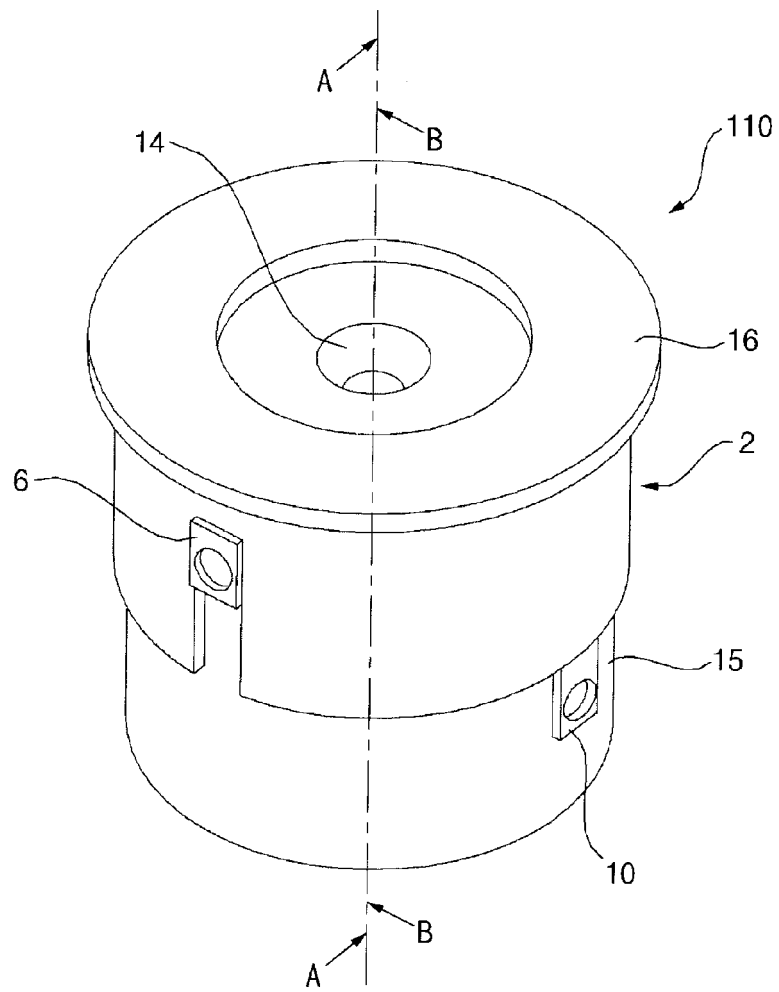
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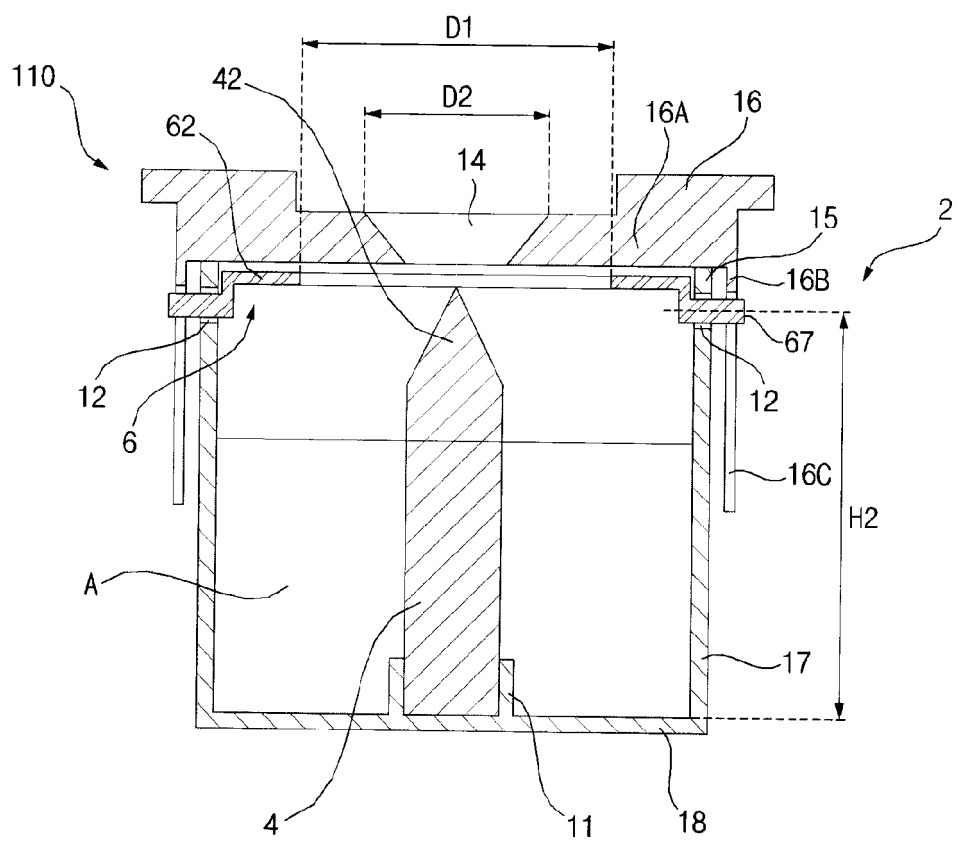
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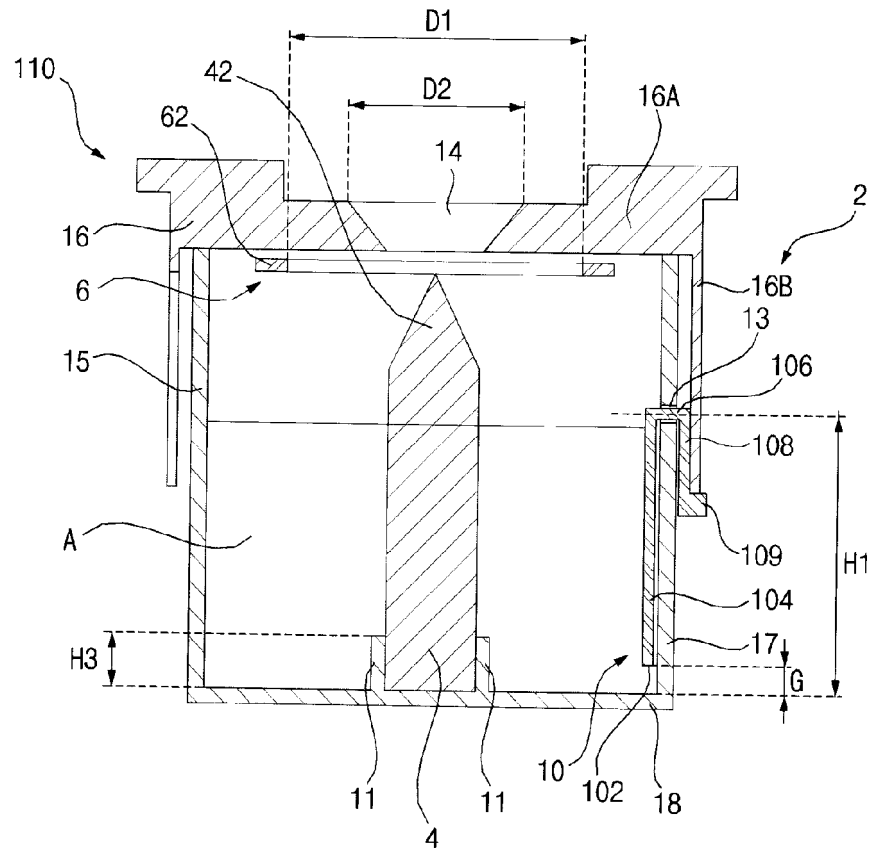
[Fig. 1]



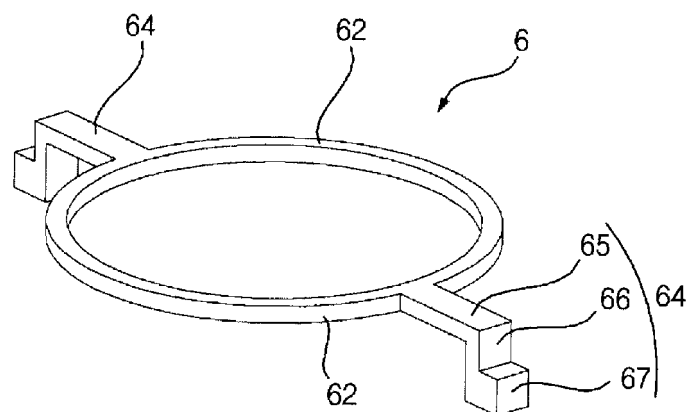
[Fig. 2]



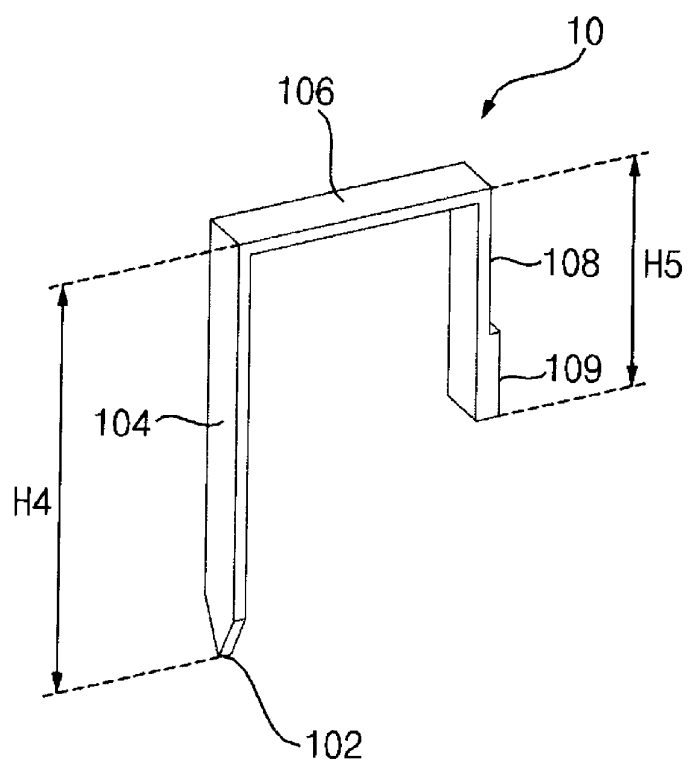
[Fig. 3]



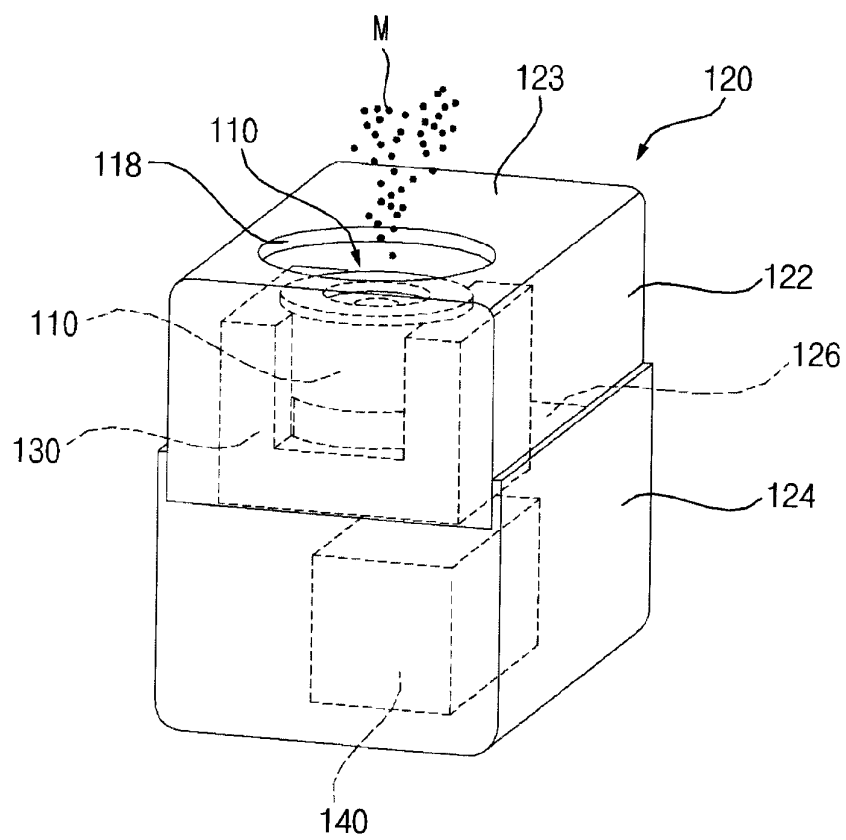
[Fig. 4]



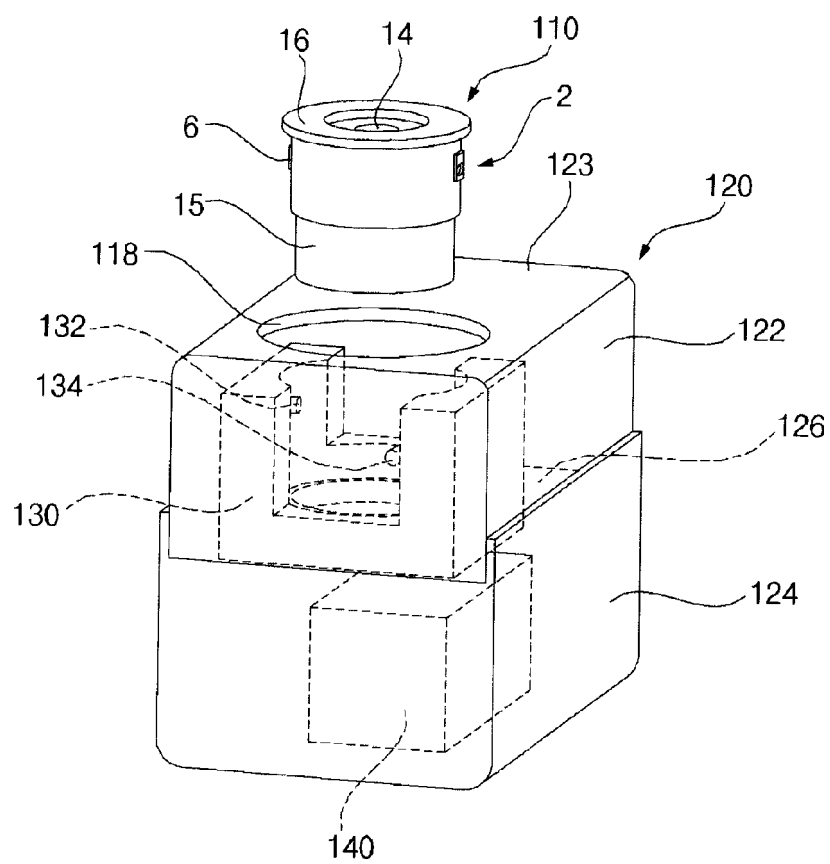
[Fig. 5]



[Fig. 6]



[Fig. 7]



REFERENCES CITED IN THE DESCRIPTION

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