(11) Application No. AU 2001237455 B2

(19) AUSTRALIAN PATENT OFFICE

(54) Title

Multi-use heating device for the evaporation of active substances

(51)6 International Patent Classification(s)

H01C 7/02 (2006.01) 20060101ALI20060101BHAU
A01M 1/20 (2006.01) A61L 9/03 20060101ALI20060101BHAU
A61L 9/03 (2006.01) H01C 1/014 20060101ALI20060101BHAU
H01C 1/014 (2006.01) H01C 1/084 20060101ALI20060101BHAU
H01C 1/084 (2006.01) H01C 7/02 20060101BHAU
20060101AFI20 PCT/ES01/00094
060101BHAU
A01M 1/20

(21) Application No: 2001237455 (22) Application Date: 2001.03.13

(87) WIPO No: WO02/073637

(43) Publication Date : 2002.09.24

(43) Publication Journal Date : 2003.03.20

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(56) Related Art

EP 584800
WO 2000/006212
US 5142265
EP 689766
US 4973934

(12) SOLICITUD INTERNACIONAL PUBLICADA EN VIRTUD DEL TRATADO DE COOPERACIÓN EN MATERIA DE PATENTES (PCT)

(19) Organización Mundial de la Propiedad Intelectual
Oficina internacional

(43) Fecha de publicación internacional
19 de Septiembre de 2002 (19.09.2002)

PCT

(10) Número de Publicación Internacional
WO 02/073637 A1

(51) Clasificación Internacional de Patentes⁷: H01C 7/02, 1/014, 1/084, A61L 9/03, A01M 1/20

(21) Número de la solicitud internacional: PCT/ES01/00094

(22) Fecha de presentación internacional:
13 de Marzo de 2001 (13.03.2001)

(25) Idioma de presentación: español

(26) Idioma de publicación: español

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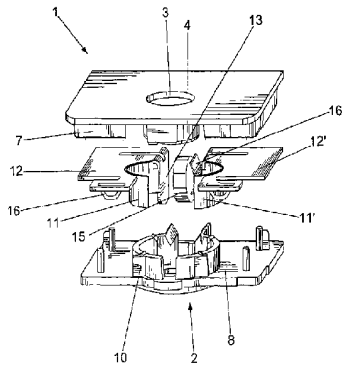
(81) Estados designados *(nacional)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

[Continúa en la página siguiente]

(54) **Title:** MULTI-USE HEATING DEVICE FOR THE EVAPORATION OF ACTIVE SUBSTANCES

(54) **Título:** DISPOSITIVO CALEFACTOR MULTIUSO PARA EVAPORACION DE SUSTANCIAS ACTIVAS



(57) **Abstract:** The invention relates to a structure comprising a base (1) and a cover (2). Said base (1) is provided with an opening (3) that extends into a neck (4) which is used to connect the wick of the container when a liquid product is involved. Said neck (4) is housed inside another cylindrical neck (10) which is disposed in the cover (2) when in closed position, defining an annular housing containing arched partitions (11-11'). Said partitions are obtained by die-stamping the respective plates (12-12') which act as a radiator and which are provided with parallel blades (13) that are bent in an orthogonal manner. The PTC resistor (15) and a spring (16), which facilitates the electrical connection, are positioned between said blades, such that the plates (12) act not only as radiators but also as means for supplying electricity to the resistor (15), for which said plates are provided with connectors (16) that receive the corresponding cables.

(57) **Resumen:** A partir de una carcasa constituida por una base (1) y una tapa (2), en la base (1) se establece un orificio (3) prolongado en un cuello (4), para acoplamiento de la mecha del recipiente cuando se trate de un producto líquido, alojándose dicho cuello (4) en el interior de otro cuello cilíndrico (10) de la tapa (2) en situación de

[Continúa en la página siguiente]

WO 02/073637 A1

(84) Estados designados *(regional)*: patente ARIPO (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), patente euroasiática (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), patente europea (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), patente OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Publicada:
— *con informe de búsqueda internacional*

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cierre, definiendo un alojamiento anular en el que se establecen tabiques arqueados (11-11'), obtenidos por troquelado de respectivas chapas (12-12') en funciones de radiador, las cuales cuentan además con aletas (13) ortogonalmente acodadas y paralelas entre sí, entre las que se establece la resistencia PTC (15) y un resorte (16) que favorece la conexión eléctrica, de manera que las chapas (12) no sólo actúan como radiadores sino además como medios de alimentación eléctrica de la resistencia (15) para lo que cuentan con conectores (16) receptores de los correspondientes cables.

MULTIUSE HEATING DEVICE FOR THE EVAPORATION OF ACTIVE SUBSTANCES

DESCRIPTION

PURPOSE OF THE INVENTION

This invention refers to a heater device for the evaporation of active substances, such as those used as insecticides or air-fresheners, of the type that use an electrical resistance, preferably of the PTC type, as means of heating. The heater has a multiuse character, that is that it is structured to be able to carry out the evaporation of products in liquid state, in tablets or in the form of gel, indistinctly, achieving an optimum performance independent of the nature of the product to be vaporized.

BACKGROUND TO THE INVENTION

Electrically operated heater devices exist that produce the evaporation of liquids held in diffusers, in some cases, in other cases solids, in the form of tablets; and sometimes they even allow the use of tablets or liquids indistinctly, according to choice.

The devices presently known for the evaporation of those products are usually fabricated using a PTC type electrical resistance connected to a pair of metallic contacts. When activated, the electrical resistance heats a ceramic or metallic plate through which, and placed near a tablet diffuser, produces the evaporation of the corresponding substance. On the other hand, the heater device can have an opening in which a wick is placed, that is brought out to the exterior of a diffuser vessel holding a liquid product; so that the heating of that wick produces the evaporation of the liquid substance held in the vessel.

For that reason, a single heater device is not advisable, nor efficient, for carrying out the evaporation of products in tablet form and liquid form, indistinctly, since the optimum working temperature of the wick when

liquid products are concerned doesn't coincide with that of a tablet, when solid products are concerned. Therefore two types of heater devices are usually sold, one specific for liquids and another, also specific, for solids or tablets.

In attempting to prevent this problem this applicant is holder of the Spanish Invention Patent, with Application number 9801592, that describes a multiuse heater device in which the electrical resistance is complemented with an aluminium plate acting as a radiator, that is adequately held inside the corresponding body. Both the body and the aluminium plate having an opening through which a wick may be passed emerging through the mouth of a vessel that holds a liquid product; at the same time that a frame type separator element is placed on the body, with means of attachment to the body, forming a support surface for a tablet that can thus be separated to a greater or lesser extent from the heating plate by means of the separating element, so that the tablet always has adequate heat to achieve its evaporation with maximum efficiency.

This solution is structurally complex since two radiators are needed, one for heating the tablet and another for heating the wick, since exclusively using a radiator for the tablet, the heat transfer to the wick could be insufficient.

However, the aluminium plate that acts as a radiator is kept physically independent of the PTC resistance by an insulating film that hinders the transfer of heat from the resistance to the radiator or aluminium plate.

Furthermore, the connection contacts of the PTC resistance as well as being independent from each other, are also independent from the radiator, which multiplies the number of parts and complicates the structure of the device.

DESCRIPTION OF THE INVENTION

The heater device that the invention proposes fully and satisfactorily resolves the forementioned difficulties, in each and every of the different aspects commented upon, forming a solution of maximum structural simplicity and optimum operation, with perfect homogeneity in the extension of heat to a pellet, on all its receptive surfaces, and also with an notable provision of heat to a wick, in the case that the product is liquid coming from a container vessel, also having a uniform distribution of the heat to all the periphery of the wick.

For this purpose and more specifically the heater device that is proposed is fabricated starting with a plastic body which has two parts, a base and a cover, properly interconnectable and securable by any conventional means. The forementioned base is fitted with a circular opening extended into a cylindrical neck, for access of the wick in the case of coupling of the device to a vessel holding the product in liquid phase. This neck is coaxial with the other that exists in the cover, encircling the first and of greater diameter, to define between them a ring-shaped throat in which two aluminium plates are placed, curved and opposed, acting as a radiator, so that together they mainly grip the neck of the base through which the wick has to pass; these curved plates being a single-piece extension of other flat plates, from which they are obtained by die pressing,designed to adapt to the bottom of each of the two halves of the base of the body, impacting mainly on its surface,and designed for heating in the case of a pellet or solid product.

In accordance with another of the characteristics of the invention the two flat plates have orthogonally bent wings, also flat, that in the assembly are parallel to each other and sufficiently distanced to allow the placing between them of the PTC resistance, together with a spring that assures an optimum connection, so that the aluminium pieces not only form the thermal radiator, both for products in pellet form and for liquid products, but furthermore it forms part of the PTC resistance supply circuit, specifically forming the connection terminals between this resistance and the electrical supply cables of the device.

Obviously both the base of the heater and the supplementary

cover will be duly configured for, after their assembly, duly immobilizing the different functional components of the device in their interior.

The bottom of the base acts externally as a support surface for the pellet of solid product, so that the degree of heating of the latter will be a function of the thickness of the wall of the bottom of the forementioned base piece of the heater body.

DESCRIPTION OF THE DRAWINGS

To supplement this description and with the aim of leading to a better understanding of the characteristics of the invention, in accordance with a preferred example of its practical embodiment, as an integral part of this description it is accompanied by a set of drawings where in an illustrative and non-limiting way, the following have been represented:

Figure 1.- Shows a side elevation and cut-away of a multiuse heating device for the evaporation of active substances, carried out in accordance with the aim of this invention.

Figure 2.- Shows the same cut-away as the previous figure, now with a perspective view.

Figure 3. - Shows a plan view and two 90^{O} profiles of the assembly of the previous figures, duly mounted.

Figure 4.- Finally shows in perspective view, the device of figure 3 duly attached to a vessel that supplies liquid product.

PREFERABLE EMBODIMENT OF THE INVENTION

In view of the figures depicted it can be observed how the multiuse heater device that the invention proposes is fabricated starting from a body, which has a base (1) and a cover (2), a base (1) that forms a kind of approximately prismatic-rectangular bowl, with a perfectly flat bottom wall

(1), fitted with a circular opening (3) extended in a neck (4), also cylindrical, of adequate dimensions to allow the wick (5), from a vessel (6) holding the product in liquid state, to be relatively tightly passed through it, when it is considered appropriate, while the same external surface of the bottom (1) forms the flat support base for a tablet, not shown in the drawings, when the use of a solid phase product is intended.

As well as the neck (4) rising from its bottom wall, the base (1) incorporates a peripheral partition (7), partially open, intended to receive, at its free edge, an essentially flat plate (8), forming the cover (2) and fitted with internal separators (9), as well as a cylindrical neck (10), also lateral and partially open, of greater diameter than the neck (4) of the base (1), intended to receive this latter in its cavity and to form with it a ring-shaped housing for a pair of curved partitions (11-11'), obtained by die pressing from two aluminium plates (12-12'), flat and in the same plane, designed to be seated on the bottom of the base (1), specifically leaving free this latter's neck (4) the said partitions (11) being placed in correspondence with this latter; at the same time that these aluminium plates (12-12') respectively incorporate fins (13), orthogonally bent in the same direction as the partitions (11), flat and parallel, destined to act as terminals between which the PTC electrical resistance (15) and a small spring (16) that assures its good electrical contact with the fins (13), are established, which through the same plates (12-12'), join to the connection terminals (16) for the respective electrical supply cables, not shown.

The dimensions of the PTC resistance (15), specifically its diameter, obliges an over-dimensioning of the body, to said effect the cover (2) incorporates a closed protuberance (17) that partially houses in its interior both the PTC resistance (15) and the extremity of the connection fins (13).

Thus it is achieved that the device can be applied to the wick (5) of the vessel (6) holding a liquid product, as shown in figure 4, where the optimum heating of the forementioned wick (5) is assured by the curved partitions (11) that mostly surround this wick (5) impinging on a broad sector of it. The device can similarly be used for products in solid state, in which

case the opening or cylindrical housing (3) for the wick is inoperative, the pellet (not shown) being placed in position, on the flat surface of the base (1) of the heater; a surface that, in turn, is mostly impinged on by the flat internal aluminium plates (12-12') acting as a radiator, with an optimum and homogeneous thermal transfer.

Where the terms "comprise", "comprises", "comprised" or "comprising" are used in this specification, they are to be interpreted as specifying the presence of the stated features, integers, steps or components referred to, but not to preclude the presence or addition of one or more other feature, integer, step, component or group thereof.

The claims defining the invention are as follows:

1. A multiuse heater device for the evaporation of active substances, being fabricated starting with a body in which an electrical resistance, PTC type, is placed, with its corresponding electrical supply connectors; an opening being made in the body for passing a wick from a vessel holding the product, when this is in liquid phase; a flat surface being defined in the body for positioning a pellet, when it is a substance in solid state, said multiuse heater device having in its interior a radiator that allows the dissipation of the heat generated by the resistance, said radiator being formed of two symmetrical aluminium plates, in each one of which a main flat section is defined, these sections to be placed in the same plane, and each of them being die pressed forming a semi – cylindrical curved partition, and a flat fin; while in the base and cover of the body twin coaxial necks and are established, forming between them a ring – shaped fluting in which the curved partitions are established, to surround, in its case, the wick supplying the product from a vessel, while the fins adopt a parallel layout and receive between them the PTC resistance and a metal strip or spring.

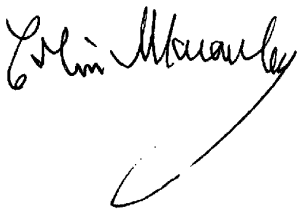
2. The multiuse heater device of claim 1, wherein the plates forming the thermal dissipation radiator also act as electrical connectors for the PTC resistance, the spring assuring the electrical contact of this resistance with the fins, opposite which and above the plates the terminals for connection of the respective electrical supply cables are set up.

3. The multiuse heater device of claim 1 or 2, wherein the base incorporates a peripheral partition, partially open, for holding in its interior the two metallic plates that act as a radiator, this container being closed by means of the cover fitted with separators that participate in the stabilization of the radiator plate, said cover having a protuberance for housing the projecting section of the PTC resistance and the connection arms.

4. The multiuse heater device of any one of the preceding claims, wherein the thickness of the wall of bottom of the base, on which the pellet must be supported, is variable according to the anticipated level of heat transfer to this pellet, in turn according to its characteristics.

5. A multiuse heater device, substantially as herein described with reference to any one of the drawings.

Dated this 1st day of August, 2003
DBK ESPANA, S.A.
By their Patent Attorneys:
CALLINAN LAWRIE



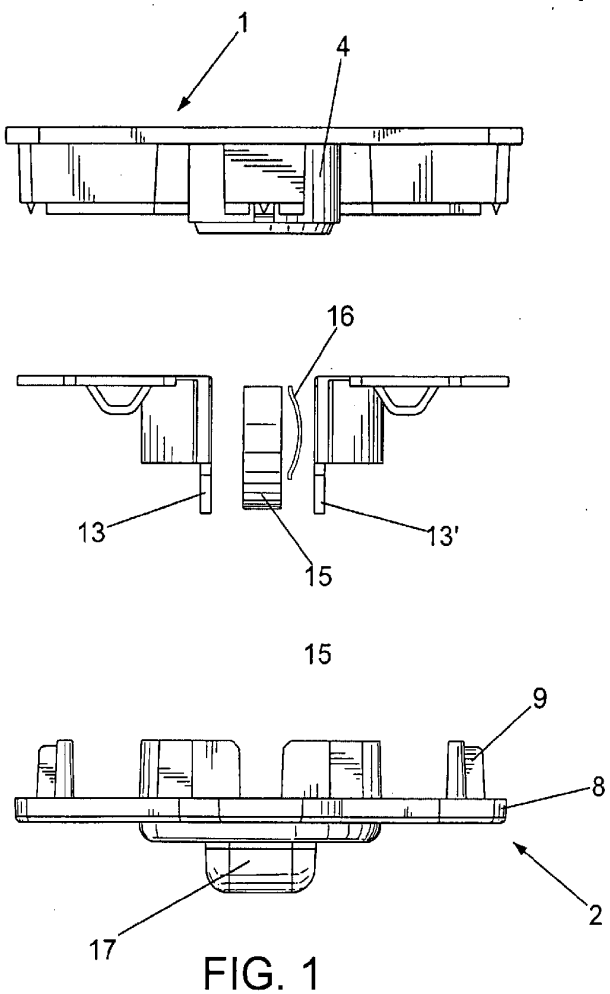


FIG. 1

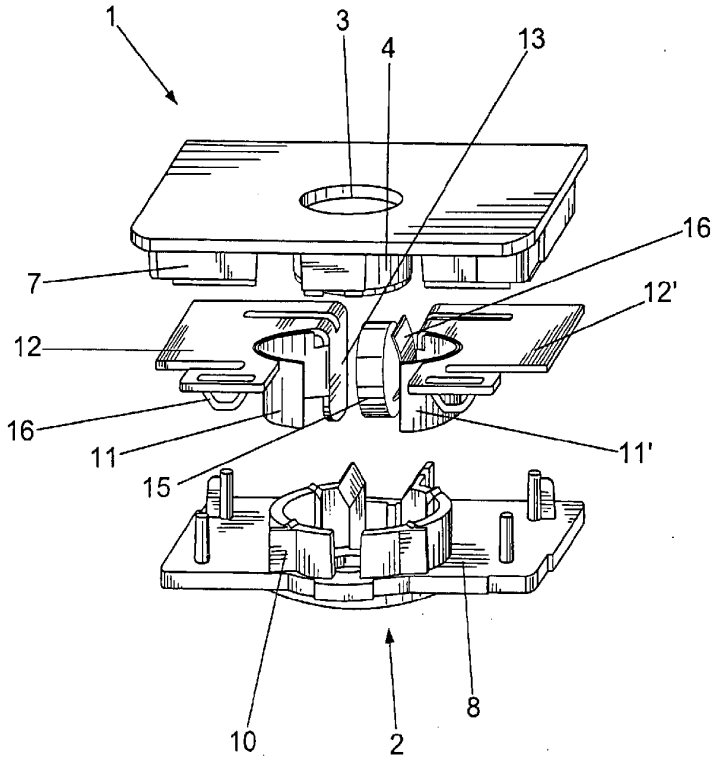


FIG. 2

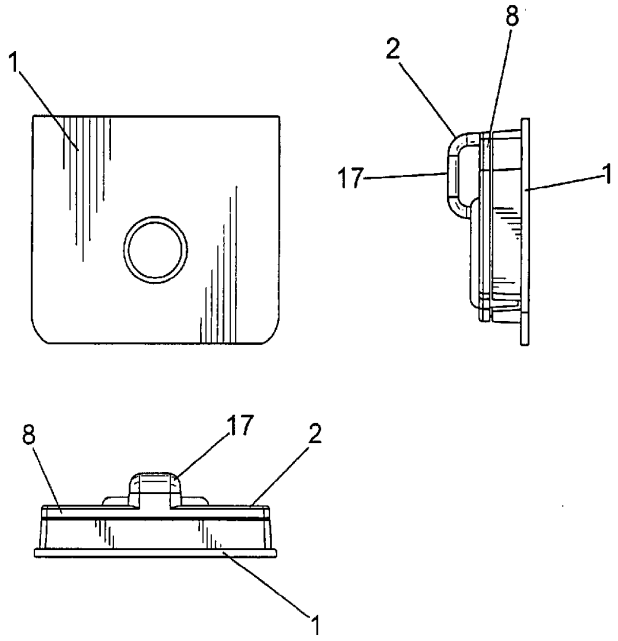


FIG. 3

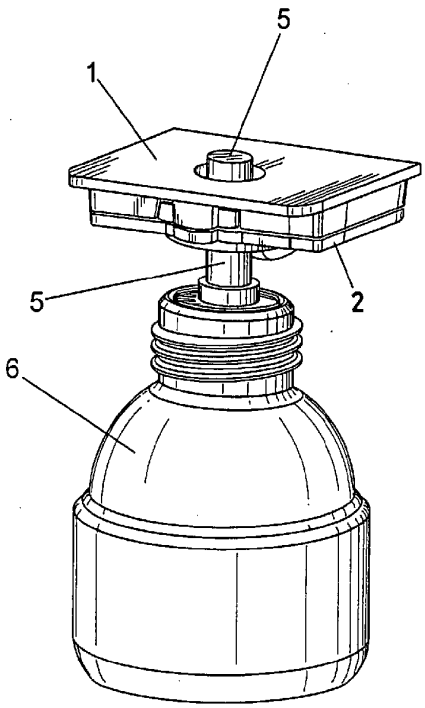


FIG. 4