

PATENT SPECIFICATION

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COMPLETE SPECIFICATION

Improvements in or relating to Fumigating Means

We, VULCAN FUMIGATOR CO. LIMITED, a British Company, of London House, 3, New London Street, London, E.C.3, and FRANK ERNEST TEMPLEMAN, of British Nationality, residing at 41, Tees Drive, Harold Hill, Romford, Essex, England, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to means for disseminating a fumigating gas or vapour suitable for fumigating or disinfecting houses or other buildings for the destruction of insects and like vermin.

It is an object of the invention to provide electrically operated fumigating means which are simple to manufacture and which are simple and effective in use.

According to the invention an electrically operated fumigating means comprises a base member or plug for connection to a source of electric power, an inner bulb made of heat-resisting glass secured to the base member or plug and a heating element disposed within the inner bulb, an outer bulb made of heat-resisting glass mounted integrally with and in concentric spaced relation to the inner bulb and one or more apertures in the wall of the outer bulb for feeding in a fumigating substance and for the passage of fumigating vapour from said bulb.

The fumigant, disinfectant or pesticide is such that it will vaporise when heated within the glass bulb. The material may be in the liquid or in the solid state, but is preferably in the solid state in the form of powder, pellets or tablets. A particularly advantageous material, for example, is the gamma isomer of benzene hexachloride or dichlorodiphenyl-trichloroethane (D.D.T.), but any suitable material having similar insecticidal or pesticidal properties may be used. The fumigant or disinfectant or other like material may be used alone or in the form of a compo-

sition, for example, a composition containing 80% benzene hexachloride, 15% fixative, and 5% odouriser or scent, such for example as pine.

The fumigant or like material is placed in the glass bulb through the apertures provided in the walls of the bulb, in such manner that, when electric power is applied to the heating means, heat is transmitted to the fumigant, which is vaporised thereby, the vapours thus formed passing out from the bulb through the apertures in the walls, into the surrounding atmosphere.

The invention is diagrammatically illustrated by way of example in the accompanying drawings, in which:—

Figure 1 is a section partly in elevation of one construction of the fumigating means, according to the invention.

Figure 2 is an elevation of one construction of the electric heating means and its support, and

Figure 3 is a sectional view of a modified construction of the fumigating means, according to the invention.

Referring to Figure 1 of the drawings, the glass bulb 1 is made of a heat-resisting glass, such for example as the glass marketed and sold under the Registered Trade Mark "Pyrex", and is provided with apertures 2 in its walls. At its upper end, the bulb 1 is provided with a base member or plug 3, of conventional construction, for insertion into a socket for connection to a source of electric supply. An inner tube 4, also of a heat-resisting glass, is mounted to extend lengthwise within the bulb 1, and is secured as by welding, at 5, to the lip of the bulb 1. The lower end of the inner tube 4 is closed and extends to a position short of the lower or domed end of the bulb 1. A heating element 6 (Figure 2), advantageously made of a nickel-chrome alloy, in the form of a coiled wire wound around the lower end of a support 7, is disposed within the inner tube 4. The support 7 is made of a refractory material,

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such as a ceramic material, and is of a diameter to maintain the coils of the heating element 6 in contact with the inner surface of the tube 4. Leads 8 which are advantageously also of a nickel-chrome alloy of the element 6 extend through a bore provided in the support 7 and are secured to contacts provided on the base member or plug 3.

The construction of the invention, in which the glass is of a heat-resisting nature, and the heating element is disposed substantially in contact with the inner surface of the wall of the inner tube, enables the wattage required to heat and vaporise the fumigant to be relatively low, and ensures that the fumigant is rapidly and efficiently vaporised.

Figure 3 of the drawings shows a modified construction of fumigating means according to the invention, in which the heating element 6 is embedded within the refractory material of the support 7 or is mounted within bores formed in the support 7. The leads 8 of the element 6 extend through a washer or plug 10, which is advantageously made of asbestos which is thoroughly compressed and dried before mounting in the tube 4.

The portions of the leads 8 above the washer or plug 10 are advantageously surrounded by sleeves 9 of an insulating material. Freely mounted in spaced relation around the end of the inner tube 4 is a floating cap 11 of cup-shaped form, with an outwardly flared circumferential rim 11a, the purpose of which is to facilitate the insertion, through one or more of the apertures 2 in the wall of the glass bulb 1, of strips of packing 12 preferably of a wood-free packing, into the annular space between the cap 11 and the inner tube 4, for the purpose of protecting the tube 4 and the cap 11 against fracture during transport. The cap 11 further serves to equalise the temperature at the lower end of the heating element 6 so as to prevent too violent expansion or contraction of the outer bulb 1, and to prevent annealing and consequent fracture at the base of the bulb 1. Thus the cap 11 serves to equalise the heat transfer between the parts of the device and between the parts of the device and the fumigating substance, thus ensuring a longer life for the bulb.

WHAT WE CLAIM IS:—

1. Electrically operated fumigating means comprising a base member or plug, for connection to a source of electric power, an inner bulb made of a heat-resisting glass secured to the base member or plug, a heating element disposed within the inner

bulb, an outer bulb made of heat-resisting glass mounted integrally with and in concentric spaced relation to the inner bulb, and one or more apertures in the wall of the outer bulb for feeding-in a fumigating substance and for the passage of fumigating vapour from said bulb.

2. Electrically operated fumigating means according to Claim 1, in which the electric heating element is provided with leads which are in electrical connection with the base member or plug.

3. Electrically operated fumigating means according to Claim 1 or Claim 2, in which the electric heating means comprises a coiled wire wound around a refractory support.

4. Electrically operated fumigating means according to Claims 1 or 2, in which the electric heating means comprises a coiled wire provided within a refractory support.

5. Electrically operated fumigating means according to any one of the preceding claims, in which a cup-shaped glass cup is freely mounted around the lower end of the inner glass tube, in spaced relation to the inner tube.

6. Electrically operated fumigating means according to Claim 5, in which the glass cup is provided with an outwardly flared rim.

7. Electrically operated fumigating means according to Claim 5 or Claim 6, in which a strip or strips of packing is or are provided in the annular space between the cup and the inner tube.

8. Electrically operated fumigating means according to any one Claims 2 to 7, in which the leads of the heating element extend through a plug or washer mounted in the open end of the inner tube, the plug or washer being made of a highly compressed asbestos or like material.

9. Electrically operated fumigating means according to Claim 8, in which the portions of the leads extending above the plug or washer are surrounded by sleeves of insulating material.

10. Electrically operated fumigating means substantially as hereinbefore described and illustrated in Figures 1 and 2 of the accompanying drawings.

11. Electrically operated fumigating means substantially as hereinbefore described and illustrated in Figure 3 of the accompanying drawings.

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Agents for the Applicants.

PROVISIONAL SPECIFICATION

No. 33995, A.D. 1954.

Improvements in or relating to Fumigating Means

We, VULCAN FUMIGATOR CO. LIMITED, a British Company, of London House, 3, New

London Street, London, E.C.3, and FRANK ERNEST TEMPLEMAN, of British Nationality,

of 41, Tees Drive, Harold Hill, Romford, Essex, England, do hereby declare this invention to be described in the following statement:—

5 The invention relates to means for the dispersal of a medium suitable for fumigating or disinfecting houses or other buildings for the destruction, for example, of insects or like vermin.

10 It is an object of the invention to provide electrically heated fumigating means which are simple to manufacture and which are simple and effective to use.

15 According to the invention, an electrically operated fumigating means comprises a glass vessel or bulb provided with one or more apertures and mounted on a cap adapted for connection to a source of electric current, an inner tube of heat-resistant glass mounted
20 within the glass bulb, and electrical heating means disposed within the inner tube, advantageously closely adjacent to or in contact with the inner surface of the inner glass tube. The glass bulb is also advantageously made
25 of a heat-resistant glass.

The electrical heating element advantageously comprises a coil of wire wound as a helix on a heat-resistant or refractory support disposed within the inner tube, the diameter of the support being such that the coil of wire is maintained in contact with or closely adjacent to the inner surface of the tube. The leads of the coil may be disposed in a bore or bores provided within the support. A plug or a collar may be provided
35 to retain the support in position within the inner tube.

The fumigant, disinfectant or pesticide, for example, the gamma isomer of benzene hexachloride or dichlorodiphenyl-trichloroethane (D.D.T.) or other material having similar properties, and/or deodorisers such as pine, is such as will vaporise when heated within the glass bulb. The material may be in the liquid or solid state, but it is preferably in the solid state in the form of powder, pellets or tablets. The fumigant, disinfectant or other like material may be used alone or in the form of a composition, for example, a composition containing 80% benzene hexachloride, 15% fixative and 5% odouriser or scent.

The fumigant or like material is placed in the glass bulb through the apertures provided
55 in the walls of the bulb. The bulb is advantageously provided of a form whereby, when the bulb is in its normal position of use in an electric socket, the material rolls or falls into contact with, or into a position closely adjacent to, that portion of the inner tube

within which the heating element is provided. In use, heat from the element is transmitted to the fumigant which is vaporised, the vapours passing out of the bulb, through the apertures in the walls, into the surrounding atmosphere.

By providing the glass of a heat-resistant nature, such as that known under the Trade Mark "Pyrex", the heating element may be disposed in contact with or closely adjacent to the inner surface of the wall of the inner tube, whereby the heat generated is effectively used in heating the fumigant and so reducing the wattage required. As the heat conductivity of the fumigants vary, the provision of the inner tube of a heat-resistant glass greatly reduces the risk of breakage of the inner tube, and avoids the provision of subsidiary protective means and/or of a more complicated construction which would otherwise be required with ordinary glass. Furthermore, by providing the heating element externally of the support, the manufacture of the fumigating means, particularly of the unit comprising the element and its support, is simplified.

The fumigating means comprises a bulb of heat-resistant glass, having apertures in its walls and provided with a cap of known construction for insertion into a socket provided in an electrical circuit. An inner tube of heat-resistant glass is mounted to extend lengthwise within the bulb and is secured, as by welding, to the lip of the bulb. The lower end of the tube is closed and is disposed adjacent to the lower or domed end of the bulb. A heating element in the form of coiled wire wound around the lower part of a ceramic support, is disposed within the tube, the support being of a diameter to maintain the coils of the heating element in contact with the inner surface of the tube. A plug or collar may be provided at the upper end of the support to maintain the support and the heating element in position. Leads of the element extend through a bore provided in the ceramic support and are secured to contacts provided on the cap.

The fumigating substance is passed into the bulb through an aperture to fall into the domed end of the bulb and to surround the tube at a position adjacent the heating element. Upon switching on the current, heat is evolved to liquefy and vaporise the fumigating substance, the vapours of the fumigant passing out through the apertures into the surrounding atmosphere.

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PROVISIONAL SPECIFICATION
No. 8042, A.D. 1955.

Improvements in and relating to Fumigating Means

- We, VULCAN FUMIGATOR CO. LIMITED, a British Company, of London House, 3, New London Street, London, E.C.3, and FRANK ERNEST TEMPLEMAN, of British Nationality, of 41, Tees Drive, Harold Hill, Romford, Essex, England, do hereby declare this invention to be described in the following statement:—
- The invention relates to means for disseminating a fumigating gas or vapour by heat applied to a chemical substance, advantageously from a source of heat which does not operate at the same time as a source of light.
- According to the invention the fumigating means comprises in combination a glass bulb or sleeve, which may be made of heat-resistant glass, a cap into which is hermetically sealed a former on which is mounted, as by winding lengthwise of the former, a heat giving element connected by means of insulated wires made of a nickel-chrome alloy, through an asbestos or like plug or washer mounted in the cap, to the outer surface of the cap, the former being surrounded in spaced relation by an inner glass sleeve of a form corresponding to that of the former, and with the outer glass bulb or sleeve advantageously of cylindrical form with a rounded end, the ends of both sleeves being sealed into the cap, holes being provided in the outer sleeve or bulb at positions substantially mid-way in the sides of the bulb, and a floating glass cap mounted on the end of the inner sleeve.
- According to the invention furthermore, the circumferential rim of the floating glass cap may be flared outwardly to facilitate the introduction by way of holes in the wall of the outer sleeve or bulb of a packing, advantageously a wood-free packing, into the annular space between the inner sleeve and the floating cap, to ensure against fracture of the cap or of the inner or outer sleeves, in transport.
- The invention further comprises the features of construction hereinafter described.
- In carrying the invention into effect according to one construction, the fumigating means comprises an outer bulb or sleeve which may be of known form but is advantageously of elongated form, as illustrated in the drawings, with the one end rounded and at the opposite end sealed with the usual form of metal cap for electric light bulbs, for the purpose of ready connection as by a bayonet or other convenient joint to a source of electric supply.
- Mounted to extend lengthwise of the outer sleeve is a former advantageously made of ceramic substance, and serving as a base for the mounting of a current-carrying element in any convenient manner, advantageously made of a nickel-chrome alloy, the leads extending through an asbestos plug or washer mounted in the cap, and through a space in the cap to project in the end face of the cap in known manner as contact leads. The leads are insulated by sleeves of ceramic or glass material, and may be formed of an alloy of copper nickel and chromium, to avoid the danger of chemical disintegration.
- The asbestos plug or washer is highly compressed and thoroughly dried before mounting to avoid chemical interaction between the sleeves and the nickel-chromium leads.
- The ceramic former on which the current-carrying element is mounted, is surrounded by an inner sleeve of glass or other suitable material of corresponding form which extends the length of the outer sleeve or bulb to a distance short of the rounded end of the bulb, and is sealed at the inner end around the asbestos plug and to the walls of the cap. At the opposite or outer end the inner sleeve is formed to a semi-circular section.
- Holes are formed, advantageously two or more in number, at spaced radial positions in the outer sleeves or bulb for the passage through the holes of the vapour or gases emanating in the operation of the device and for the purpose of feeding in the tablets of the fumigating substance.
- Mounted in spaced relation around the end of the inner sleeve is a floating sleeve or cap of cup-shaped form with an outwardly flared circumferential rim, the purpose of which is to facilitate the insertion, through one or more of the holes in the outer bulb, of strips of packing, advantageously of a wood-free paper packing, into the annular space between the cap and the inner sleeve for the purpose of stabilising the sleeve against movement during transport.
- In operation a fumigating substance, advantageously in the form of tablets, may be introduced into the outer bulb or sleeve through the holes in the walls, the tablets coming to lie at the bottom of the outer sleeve or bulb between the inner surface of the bulb and the outer surface of the floating sleeve. On the power being switched on heat is radiated outwardly to melt the tablets, which may be of a substance containing for example benzene-hexachloride, so that the fumes are driven out under pressure through the openings in the outer sleeve or bulb.
- The cup-shaped cap on the inner glass sleeve, serves to equalise the temperature at the base of the heating element and to smooth out the radiation so as to prevent too violent an expansion or contraction of the outer bulb and to prevent its annealing at the base, with

consequent fracture. Thus the sleeve serves to equalise the heat transfer between the parts of the device and between the said parts and the fumigating substance, thus ensuring a longer life for the bulb.

5 A bulb manufactured in the manner herein-before described while relatively inexpensive avoids the disadvantages of continued heating and cooling of the glass envelopes and interaction of the metallic parts with the fumi-

gating substances and/or with the chemicals in the ceramic or asbestos bases.

The invention is not limited to the particular form or description of the parts of which the fumigating device is formed which may vary widely within the scope of the invention.

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Published at The Patent Office, 25, Southampton Buildings, London, W.C.2, from which copies may be obtained.

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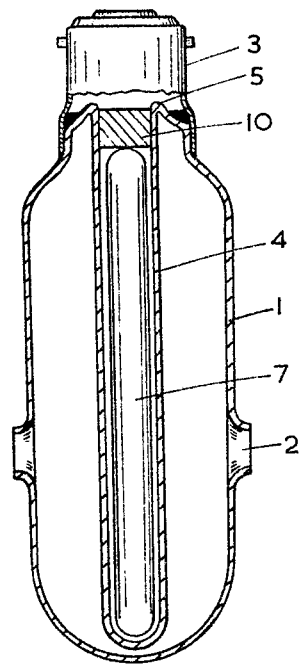


FIG. 1

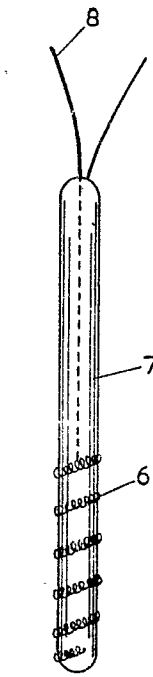


FIG. 2

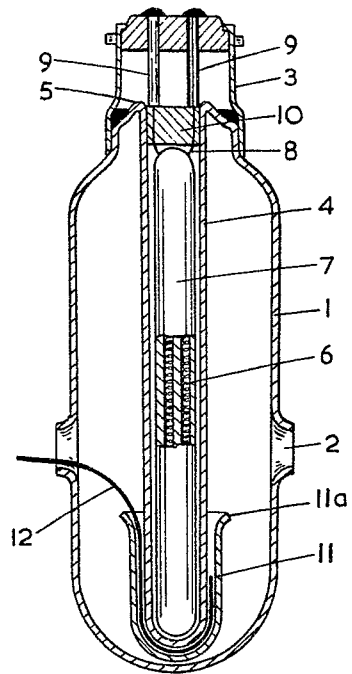


FIG. 3