April 13, 1954 A. H. BAKER 2,675,293

INSECTICIDE VAPORIZER AND METHOD OF DISPERSING DDT

Filed Oct. 29, 1946 2 Sheets-Sheet 1

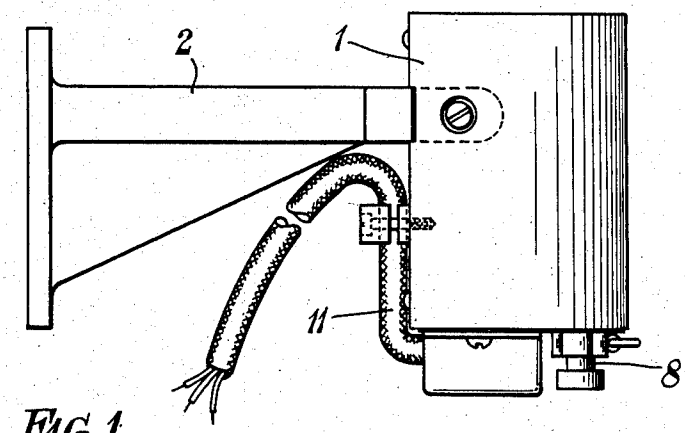


FIG. 1.

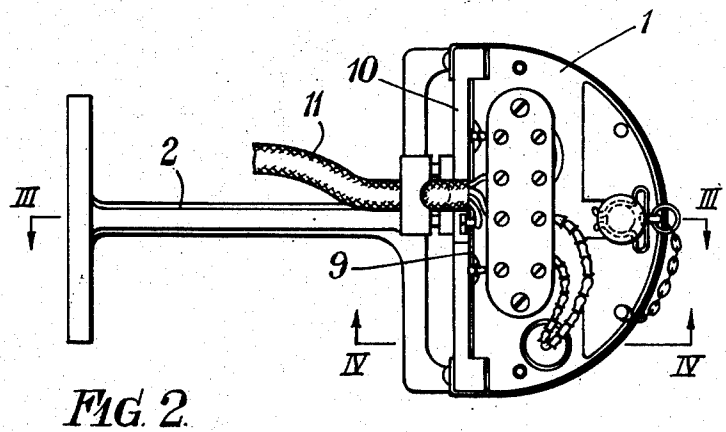


FIG. 2.

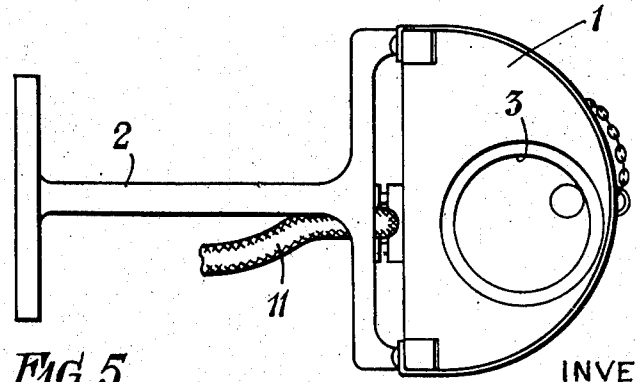


FIG. 5.

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INSECTICIDE VAPORIZER AND METHOD OF DISPERSING DDT

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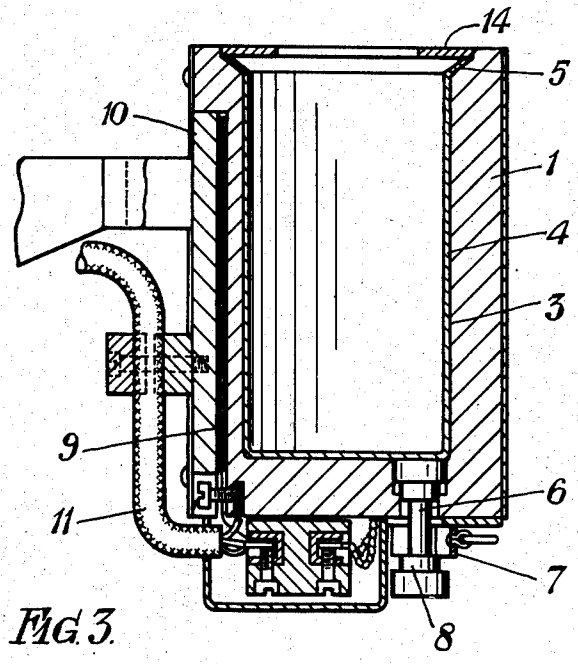


FIG. 3.

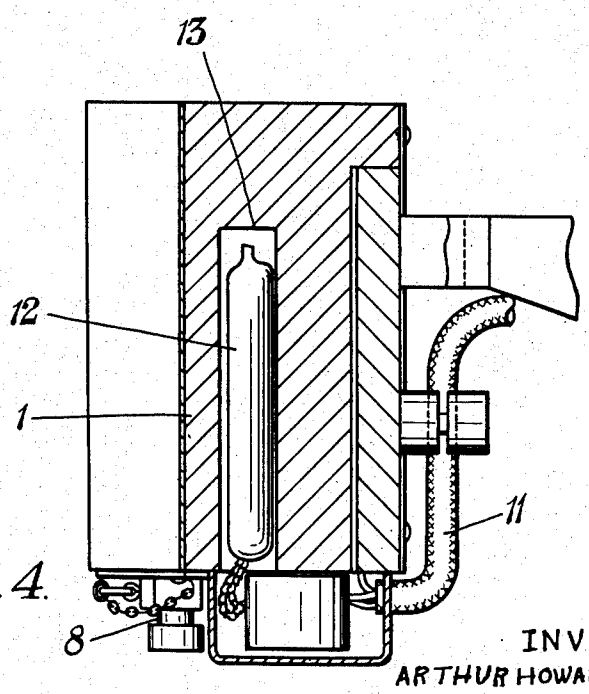


FIG. 4.

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UNITED STATES PATENT OFFICE

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INSECTICIDE VAPORIZER AND METHOD OF DISPERSING DDT

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Claims priority, application Great Britain February 15, 1946

6 Claims. (Cl. 21—53)

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The present invention relates to the production of insecticidal and germicidal mists and more particularly to aerosols that is to say dispersions of solids in air or other gases in the particulate form with a particle size of the order of ½–5 μ.

I have found that insecticidal and germicidal compounds which can be volatilised without undergoing decomposition are more highly effective in the form of aerosols than in the form of sprays or powders.

According to the present invention a method of air conditioning includes the step of exposing the air to a source of germicidal or insecticidal compound which is being converted without decomposition into the particulate form in such a manner that the particles have a diameter of the order of ½–5 μ the said particles being quantitatively absorbed in the air.

More particularly have I found that insecticidal compounds such for example as dichlorodiphenyl-trichloroethane and germicidal compounds such for example as resorcinol or hexyl-resorcinol are suitable for treatment in this manner.

In the case of DDT it has been found that when this compound is heated to a temperature sufficient to melt it and insufficient to decompose it an aerosol is produced which is many times more effective against such insects as flies than in any other known form. A convenient concentration of this compound in air is 5 mg. per cubic metre. In one test at this concentration substantially all flies exposed to it were killed within two hours. Whilst it is believed that the relative humidity of the air is not of especial importance to the effectiveness of the aerosol it is preferred that the humidity should be 45 or more. In the case of resorcinol or hexyl-resorcinol it is more important that the humidity should be above this figure.

The insecticidal compound may be mixed with suitable diluents such for example as kaolin or compounds which themselves have insecticidal or germicidal properties either in the form of a vapour or in the form of a mist or aerosol. Again the compound or compounds may be mixed with other compounds which give off perfumes which may in some cases be employed to mask the odour of the insecticidal or germicidal compounds.

As an example of a suitable temperature for converting DDT into an aerosol when in the substantially pure state temperatures ranging from 100–130° C. are preferable depending upon the length of time the compound is to be maintained at the desired temperature. In the case of resorcinol or hexyl-resorcinol or other phenolic germicidal compound a temperature of substantially 250–300° C. is usually required.

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The invention also includes apparatus for converting the above compounds into the particulate form and comprises a heat conducting body, an electrical resistance heating element incorporated in said body and a recess in said body in close proximity to said heat conducting body.

Other features of the invention and more particularly the apparatus will be described with reference to the accompanying drawings, in which:

Figure 1 shows a side view of apparatus constructed in accordance with the present invention.

Figure 2 shows an underneath plan view of the apparatus shown in Figure 1 with the terminal block cover removed.

Figure 3 shows a section on the line III—III of Figure 2.

Figure 4 shows a section on the line IV—IV of Figure 2, and

Figure 5 is a plan view of the apparatus with the pot or container removed.

Referring to the drawings a heat conducting body 1 is secured to a bracket 2 which is adapted for fitting to a vertical surface such for example as a wall stanchion or the like and to hold the body 1 in spaced relationship with the wall. By the bracket arrangement shown, it is seen that the removable container 4 from which the vapor emanates, is spaced from the wall by a distance materially greater than the diameter of such cup. Were the cup mounted against the wall or in close proximity to the wall, the vapor emanating therefrom would to a large extent reach the relatively cool wall where it would promptly condense, and that condensate would, of course, not be disseminated into the air so that the operation would be less efficient. More important, however, is the fact that the condensate would promptly flake off the wall and might drop into food or even enter the system of one or more occupants with objectionable consequences.

The body 1 is in horizontal section substantially semicircular and composed of aluminium, aluminium alloy or other material having comparatively high heat conducting values. Substantially centrally in the body 1 is a cylindrical recess 3 which extends from the top of the body almost to the base. Into this recess there fits a removable container 4 which forms a close fit with the walls of the recess 3. The top of the container is provided with a lip 5 which facili-

tates the removal of the container 4. To effect the removal of the container 4 from the body an ejector 6 is slidably mounted in the base of the body 1 so that the top end bears against the bottom of the container 4 and to eject the container the ejector is pushed upwardly so as to lift the container partially from the recess 3 when it can be removed easily by gripping the lip 5. To prevent accidental ejection of the container a clip 7 is provided which when in position bears against the base of the body 1 and against an enlarged portion 8 of the stem of the ejector 6. This effectively prevents the ejector being operated until the clip 7 is removed.

Incorporated in the body 1 is an electrical resistance heater 9. This heater extends substantially the full depth of the body 1 and lies in close proximity to the recess 3. It is held firmly in contact with the material of the body 1 by a plate 10 forming part of the body which plate is firmly screwed to the main part of the body so as to press the heater element 9 firmly into contact with itself and the main part of the body. This resistance heater 9 is connected by the usual wiring 11 to a suitable electric supply and its temperature is controlled by means of a thermostat 12 which is housed in a recess 13 in the body 1 and somewhat spaced from the heater element 9. This thermostat takes its temperature from the body 1 and cuts the electric heater in or out according to its predetermined temperature of operation. In this manner the material in the container 4 is maintained closely to the desired temperature.

To control the output of aerosols at any predetermined temperature a removable ring 14 fits onto the top of the container 4. The output of aerosols can then be controlled by choosing a ring 14 having the desired central aperture. Alternatively the output may be controlled by changing the thermostat.

In use the germicidal or insecticidal compound which may conveniently be pressed into the form of a cake to fit the container 4 is inserted into the container and with a ring 14 having a suitable aperture for the room to be treated the heater is switched on. When the material is melted and the predetermined temperature reached it is volatilised into the particulate form, the particles being of the order of ½–5 μ in diameter. These particles immediately become quantitatively absorbed in the air in the room. If desired the device can be incorporated into the known forms of air conditioning and in this case the air prior to entry into the room may be caused to flow in a confined stream past the device.

What I claim is:

1. The method of maintaining substantially free from certain airborne vermin, a ventilated room suitable for human occupancy, which comprises treating a vaporizable organic composition of the type that has a melting point above 100° C., which when disseminated in the air at concentration in the order of 5 mg. per cubic meter, is lethal to the organisms sought to be killed and harmless to higher life, and which contains a substantial proportion of dichlorodiphenyltrichlorethane, by applying heat to a mass of the composition exposed within but spaced from the wall surface of the room by a distance substantially greater than that width of said exposed mass at substantially right angles to such wall surface and maintaining its temperature between 100° and 130° C., in order to maintain the composition under conditions such as to avoid decomposition, but at temperature sufficient for vaporization and dissemination thereof into the air at a rate to maintain such concentration without objectionable condensation of the composition upon such wall surface of the room.

2. Apparatus for conditioning air in a ventilated room to render the same lethal to certain airborne vermin without annoyance or injury to higher life, which comprises a cup holder receptacle of heat conducting material having a cavity therein open at its top, a cup of substantially the diameter and height of said cavity accommodated in said holder receptacle for retaining vaporizable composition therein, bracket means rigid with and extending outward from said cup holder receptacle and of length substantially greater than the diameter of said cup, an electric heater unit and means removably affixing said heater unit in face-to-face engagement with the exterior of said cup holder receptacle, spaced from but in heat communicating relation to said cup.

3. Apparatus recited in claim 2 in which an upright slidable ejector extends through a corresponding aperture in the bottom of said cup holder element in communication with the cavity therein to serve to manually lift the cup to facilitate its removal.

4. Apparatus for conditioning air in a ventilated room to render the same lethal to certain airborne vermin without annoyance or injury to higher life which comprises a cup holder receptacle of heat conducting material having a rim at the open top thereof, a cup removably mounted in said holder receptacle for accommodating vaporizable composition therein, and having an outstanding rim supported upon the rim of said receptacle, an outstanding bracket rigid with said holder element and of length materially greater than the diameter of said cup, an electric heater unit, carried by and affixed in face to face engagement with the exterior of said cup holder receptacle, spaced from but in heat communicating relation to said removable cup, and a thermostat affixed with respect to said cup holder in heat transmitting relation with respect thereto and in circuit with said electric heater unit to maintain substantially constant, regardless of environmental conditions, the temperature and rate of dissemination of the composition within the cup.

5. Apparatus recited in claim 4 in which any of a plurality of annular disks of selected inner diameters rests removably upon the rim of the holder for adjustment in output of evolved vapor as compared with that in the absence of such disk.

6. Apparatus suitable for conditioning air in a ventilated room to render the same lethal to certain airborne vermin without annoyance or injury to higher life, said apparatus comprising a cup holder receptacle open at the top thereof, a cup removably mounted in said receptacle and extending substantially the height thereof, for accommodating vaporizable composition therein, a mounting bracket rigid with and extending laterally from said holder and of length substantially greater than the diameter of said cup, an electric heater covered by and affixed in face to face engagement with the exterior of said cup holder, confined within the apparatus, spaced from said removable cup and in heat conducting relation thereto, a thermostat associated with said cup holder element, confined in the interior

of the apparatus, spaced from said removable cup and in heat conducting relation thereto, and means separable from said cup holder receptacle to afford access to said heater and to said thermostat for convenience in service and repair.

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