

SPECIFICATION

Spray generator

5 The invention relates to a spray generator for spraying plants, especially for the control of pests and diseases of plants, such as cotton, rice and coffee plants, comprising a vibrating combustion chamber.

10 Known spray generators of this type have a resonator tube provided on the vibrating combustion chamber and having a single outlet nozzle.

15 The object of the invention is to widen the spraying range which can be sprayed with such a spray generator.

According to the invention, there is provided a spray generator for spraying plants, comprising a vibrating combustion chamber, a resonator tube connected to the combustion chamber, a distributor piece connected releasably to the resonator tube, at least two outlet nozzles extending from the distributor piece, and a diffuser tube surrounding the resonator tube and the distributor piece, the diffuser tube having branched end pieces, each end piece surrounding one of the outlet nozzles.

25 If two spaced rows of plants running next to one another are to be sprayed at the same time, two outlet nozzles pointing in directions opposite one another are preferably attached substantially at right angles to the end of the resonator tube.

35 If a wide region is to be sprayed uniformly, two outlet nozzles are preferably attached to the end of the resonator tube at acute angles to the longitudinal axis of the resonator tube.

40 In order to spray plant leaves from below or from above, the plane containing the longitudinal axes of the outlet nozzles preferably intersects the longitudinal axis of the resonator tube at an acute angle. Depending on whether said resonator tube runs obliquely downwards or obliquely upwards, a preferred spraying of the topside of the leaves or the undersides of the leaves is thereby effected.

45 In order to adapt the spraying in an especially favourable way to the respective prevailing conditions, each of the outlet nozzles is preferably provided with a separate dosing device. These dosing devices are preferably exchangeable. The outlet nozzles, also, are preferably connected releasably to the resonator tubes, so that they can be exchanged or so that the resonator tube can be cleaned.

50 The end pieces of the diffuser tube preferably have a Venturi effect so as to cool the resonator tube in use.

60 To ensure that the plants cannot settle on the outsides of the hot outlet nozzles, there are preferably situated on the outsides of the end pieces of the diffuser tube plant deflector ridges projecting therefrom. For the same reason, plant deflector ridges are preferably also provided on the end of the diffuser tube.

A spray generator according to the invention is preferably equipped with an automatic cut-off known per se which prevents spray from escaping when the generator stops for any reason whatever, for example lack of fuel. The danger of ignition of the spray is thereby obviated, and overdosing is avoided.

70 A blow-off spray cock is also preferably provided, which ensures that, when switched off, the generator blows off the remaining quantity of oil, so that no ignition can occur due to following oil which can ignite on the hot surfaces of the generator and can draw in atmospheric oxygen through the outlet nozzles. This is of especial importance, since the direction of cooling is reversed after the generator has been switched off: the vibrating combustion chamber applies a chimney effect to the outlet nozzles which draws atmospheric oxygen into the vibrating combustion chamber. The risk then arises that a residual quantity of oil or other combustible carrier may ignite. If a blow-off spray cock is provided, this cannot occur. Clearly, this precaution is especially important when oil is used as the carrier for the spray.

80 The invention is described hereinafter with reference to two exemplary embodiments shown in the accompanying drawings 95 wherein:

Figure 1 shows a first embodiment of a spray generator according to the invention,

Figure 2 shows a second embodiment of a spray generator according to the invention, 100 and

Figure 3 shows the outlet region of the spray generator shown in Fig. 2 in the dismantled state.

Fig. 1 shows a spray generator with a vibrating combustion chamber 2 which is surrounded by a perforated protective housing 3 and from which extends a resonator tube, not visible in Fig. 1, lying in a diffuser tube 4. The diffuser tube 4 is formed by a metal jacket which supplies cooling air due to a Venturi effect when the spray generator is running. The end of the diffuser tube is branched via a distributor piece 6 into two end pieces 8 and 10. The two end pieces 8, 10 point in opposite directions; their axes run at right angles to the axis of the diffuser tube 4. The distributor piece 6 and the end pieces 8, 10 surround a distributor piece, not visible in Fig. 1, which is attached releasably to the end of the resonator tube and from which depart two outlet nozzles extending concentrically in the end pieces 8, 10 and terminating upstream of the ends of the end pieces 8, 10. Attached to the outside of the end pieces 8, 10 is a forwardly pointing plant deflector ridge 12. Corresponding ridges 14, 16 are also attached to the rearside of the end pieces 8 and 10 and extend as far as the distributor piece 6, so that they also serve as reinforcements. The liquid to be sprayed is delivered

through a pipe 18 and introduced into the outlet nozzles via an adjustable and/or exchangeable valve 20 or a corresponding dosing nozzle.

- 5 In the embodiment shown in Figs. 2 and 3, a vibrating combustion chamber 30 again supplies a resonator tube surrounded by a diffuser tube 32. Attached to the free end of the diffuser tube 32 via a distributor piece 34a, 34b are two end pieces 36a, 36b, 38a, 38b which, lying symmetrically on each side of the longitudinal axis of the diffuser tube 32, form an angle of about 60°. The plane in which the longitudinal axes of the end pieces 36a, 36b, 38a, 38b lie forms an acute angle with the axis of the diffuser tube 32, so that the end pieces 36, 38 are pointed obliquely downwards. Plant deflector ridges 40, 42, 44 are attached to the leading and trailing edges of the end pieces 36a, 36b, 38a, 38b and of the distributor piece 34a, 34b. Each half of the distributor piece 34a, 34b and of the end pieces 36a, 36b, 38a, 38b is combined into a shell 34a, 36a, 38a and 34b, 36b, 38b respectively. The plant deflector ridges 40, 42, 44 are formed by flanges which connect the shells 34a, 36a, 38a and 34b, 36b, 38b to one another. The pieces 36a, 36b, 38a, 38b and the distributor piece 34a, 34b surround a distributor piece 60 which is attached releasably to the end of the resonator tube and from which extend two outlet nozzles 62, 64 running concentrically in the end pieces 36a, 36b, 38a, 38b and terminating in front of the end pieces 36a, 36b, 38a, 38b. Spacing clamps 66, 68 serve for the concentric mounting of the outlet nozzles 62, 64 in the end pieces 36a, 36b, 38a, 38b.

- The liquid to be sprayed is delivered through the pipe 46 to the two outlet nozzles 62, 64 separately via separately adjustable valves 48, 50. For this reason, the pipe 46 is divided into two branches 52, 54 upstream of the two valves 48, 50.

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CLAIMS

1. A spray generator for spraying plants, comprising a vibrating combustion chamber, a resonator tube connected to the combustion chamber, a distributor piece connected releasably to the resonator tube, at least two outlet nozzles extending from the distributor piece, and a diffuser tube surrounding the resonator tube and the distributor piece, the diffuser tube having branched end pieces, each end piece surrounding one of the outlet nozzles.
2. A spray generator according to claim 1, comprising two outlet nozzles attached substantially at right angles to the end of the resonator tube which point in opposite directions to one another.
3. A spray generator according to claim 1, comprising two outlet nozzles attached at acute angles to the longitudinal axis of the resonator tube.

4. A spray generator according to claim 3, wherein the plane containing the longitudinal axes of the outlet nozzles intersects the longitudinal axis of the resonator tube at an acute angle.

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5. A spray generator according to any of the preceding claims, wherein each of the outlet nozzles is provided with a separate dosing device.

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6. A spray generator according to any preceding claim, wherein plant deflector ridges are provided on the outsides of the end pieces.

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7. A spray generator according to claim 6, comprising further plant deflector ridges on the distributor piece between the diffuser tube end and the end pieces.

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8. A spray generator substantially as herein described with reference to Fig. 1 or Figs. 2 and 3 of the accompanying drawings.

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through a pipe 18 and introduced into the outlet nozzles via an adjustable and/or exchangeable valve 20 or a corresponding dosing nozzle.

- 5 In the embodiment shown in Figs. 2 and 3, a vibrating combustion chamber 30 again supplies a resonator tube surrounded by a diffuser tube 32. Attached to the free end of the diffuser tube 32 via a distributor piece 10 34a, 34b are two end pieces 36a, 36b, 38a, 38b which, lying symmetrically on each side of the longitudinal axis of the diffuser tube 32, form an angle of about 60°. The plane in which the longitudinal axes of the end pieces 15 36a, 36b, 38a, 38b lie forms an acute angle with the axis of the diffuser tube 32, so that the end pieces 36, 38 are pointed obliquely downwards. Plant deflector ridges 40, 42, 44 are attached to the leading and trailing edges 20 of the end pieces 36a, 36b, 38a, 38b and of the distributor piece 34a, 34b. Each half of the distributor piece 34a, 34b and of the end pieces 36a, 36b, 38a, 38 is combined into a shell 34a, 36a, 38a and 34b, 36b, 38b 25 respectively. The plant deflector ridges 40, 42, 44 are formed by flanges which connect the shells 34a, 36a, 38a and 34b, 36b, 38b to one another. The pieces 36a, 36b, 38a, 38b and the distributor piece 34a, 34b surround a distributor piece 60 which is attached 30 releasably to the end of the resonator tube and from which extend two outlet nozzles 62, 64 running concentrically in the end pieces 36a, 36b, 38a, 38b and terminating in front 35 of the end pieces 36a, 36b, 38a, 38b. Spacing clamps 66, 68 serve for the concentric mounting of the outlet nozzles 62, 64 in the end pieces 36a, 36b, 38a, 38b.

- The liquid to be sprayed is delivered 10 through the pipe 46 to the two outlet nozzles 62, 64 separately via separately adjustable valves 48, 50. For this reason, the pipe 46 is divided into two branches 52, 54 upstream of the two valves 48, 50.

15 CLAIMS

1. A spray generator for spraying plants, comprising a vibrating combustion chamber, a resonator tube connected to the combustion chamber, a distributor piece connected releasably to the resonator tube, at least two outlet nozzles extending from the distributor piece, and a diffuser tube surrounding the resonator tube and the distributor piece, the diffuser tube having branched end pieces, each end piece surrounding one of the outlet nozzles.
2. A spray generator according to claim 1, comprising two outlet nozzles attached substantially at right angles to the end of the resonator tube which point in opposite directions to one another.
3. A spray generator according to claim 1, comprising two outlet nozzles attached at acute angles to the longitudinal axis of the resonator tube.

4. A spray generator according to claim 3, wherein the plane containing the longitudinal axes of the outlet nozzles intersects the longitudinal axis of the resonator tube at an acute 70 angle.

5. A spray generator according to any of the preceding claims, wherein each of the outlet nozzles is provided with a separate dosing device.

- 75 6. A spray generator according to any preceding claim, wherein plant deflector ridges are provided on the outsides of the end pieces.

7. A spray generator according to claim 6, 80 comprising further plant deflector ridges on the distributor piece between the diffuser tube end and the end pieces.

8. A spray generator substantially as herein described with reference to Fig. 1 or 85 Figs. 2 and 3 of the accompanying drawings.

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