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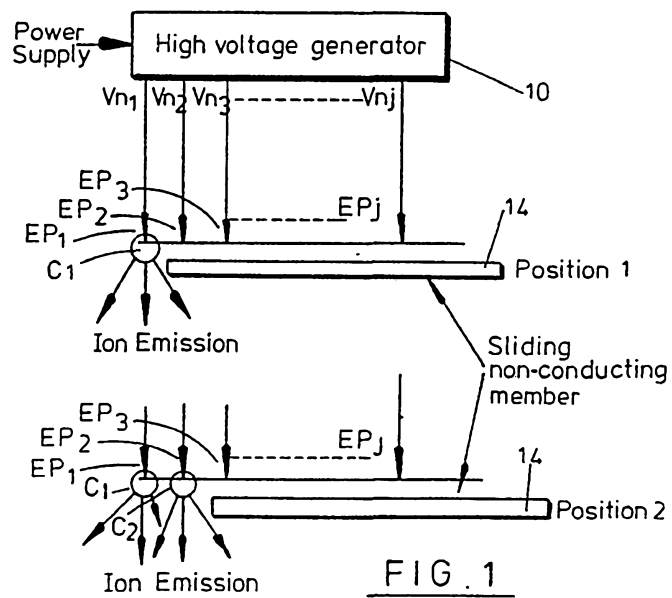
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(56) Documents cited
 GB 1227607 A US 4523082 A US 4366525 A

(58) Field of search
 UK CL (Edition K) H1X X5E X5Y
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(54) Air ionisers

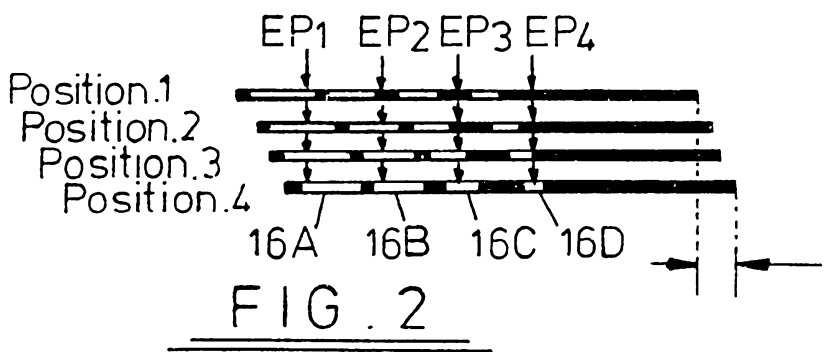
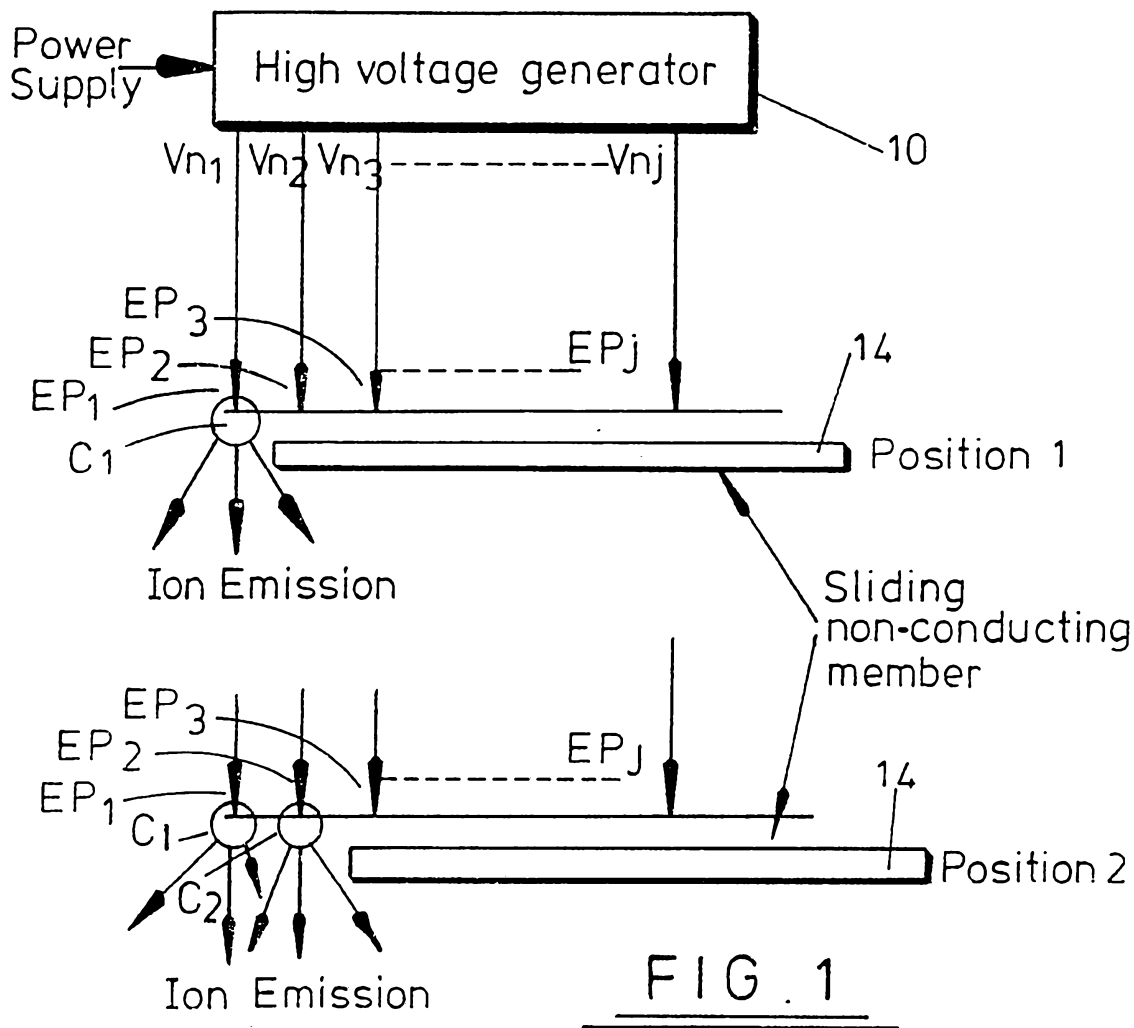
(57) An air ioniser has two or more ion emitter points EP, at least two of said emitter points being connected to a different high voltage 10 and means 14 for selectively exposing one or more of the emitter points. As shown, an insulating plastics strip 14 is slid transversely to expose sequentially a number of the emitter points EP. Preferably the first emitter point EP1 is at the lowest potential and each successive exposed emitter point is at a higher potential than the previously exposed one. In an alternative arrangement, Fig. 2 (not shown), the insulating strip has a series of different sized apertures through which the emitters are selectively exposed.



At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

This print takes account of replacement documents submitted after the date of filing to enable the application to comply with the formal requirements of the Patents Rules 1990.

GB 2 249 878 A



Title: Improvements in and relating to air ionisers

DESCRIPTION

This invention concerns air ionisers.

A corona discharge is the most usual method of
5 producing air ionisation in, for example, an enclosed
space such as a house, office, factory, greenhouse or
animal enclosure to benefit health. In an air ioniser
corona discharge is supported on an emitter point
connected to a source of high voltage. To improve
10 stability of operation and limit mechanical damage,
ionisers usually have more than one emitter point.

It is desirable to control output of ions from an
ioniser to suit requirements of a user and the
environment of the user. Existing methods of
15 controlling ion output rely on controlling the high
voltage supply to the emitter points of the ioniser.
Control of ion output is achieved by varying the
magnitude of the high voltage supply to the emitter
points by switching the electronic circuitry producing
20 the high voltage.

Attempting to control ion output by varying the
number of emitter points at the same voltage will not
alter total ion output due to mutual electrical
interference.

An object of this invention is to provide a means of controlling ion output of an air ioniser.

According to the invention an air ioniser has two or more ion emitter points, at least two of said
5 emitter points being connected to a different high voltage, and means for selectively exposing one or more of the emitter points.

The source of the different voltages may be a voltage multiplier circuit, wherein a range of voltages
10 are present on nodes of the circuit.

Preferably the means for selectively exposing said emitters comprises a non-conducting member movement of which will expose emitter points according to the extent of movement thereof. The movement of the
15 non-conducting member may be merely to uncover one or more emitter points or may be to align one or more apertures of the non-conductive member with one or more emitter points. For example, for a linear arrangement of emitter points, the non-conductive member may be
20 arranged for sliding movement to expose the emitter points sequentially. In another arrangement, a slidable non-conductive member may be provided with a series of spaced apertures sized so that lateral movement thereof relative to the emitter points will expose one, two,
25 three etc points according to the extent of said movement.

Preferably in any arrangement of emitter points the first to be exposed will be at the lowest voltage and each successively exposed emitter point will be at a higher voltage than the previously exposed emitter point.

The invention will now be further described, by way of example only, with reference to the accompanying drawings, in which:-

Figure 1 shows schematically an air ioniser according to the invention; and

Figure 2 shows schematically a particular arrangement for an air ioniser according to the invention.

Referring to Figure 1 of the accompanying drawings, an air ioniser comprises a high voltage generator 10 connected to a conventional power supply. The generator 10 has a series of corona discharge (C) emitter points (EP) connected thereto, each to a node of the high voltage generator generating a different voltage (V_n) to the others. A non-conducting strip 14, such as of plastics material, is arranged for sliding movement to expose sequentially the emitter points EP.

The sliding strip 14 exposes the emitter points EP, EP₂, EP₃,EP_j in sequence. The voltages at each node are V_{n1} , V_{n2} , V_{n3} V_{nj} respectively, where $V_{n1} < V_{n2} < V_{n3} < \dots < V_{nj}$. Thus corona discharge C₂ on EP₂ is

stronger than the corona discharge C_1 on EP_1 etc, i.e. $C_1 < C_2 < C_3 \dots \dots < C_j$. The movement of the sliding strip will allow progressively stronger corona discharges to emit air ions into the atmosphere. (It should be noted that the close proximity of the sliding non-conducting strip (14) to an emitter point will suppress corona discharge by reducing the electric field gradient to a low value.)

The form of the non-conducting member may be varied to produce different switching movements. The range of movement of the non-conducting strip 14 may be reduced by providing apertures (16 A, B, C, D) therein (see Figure 2) to correspond with the emitter points EP_1 , EP_2 , EP_3 and EP_4 required to operate at any given non-conducting strip position as shown. As can be seen the apertures decrease in size from emitter EP_1 to emitter EP_4 . The emitter points are connected as in Figure 1 to successively higher voltages.

The operational sequence achieved by lateral movement of the non-conducting member is as follows:

| | EP_1 | EP_2 | EP_3 | EP_4 |
|------------|--------|--------|--------|--------|
| Position 1 | on | off | off | off |
| Position 2 | on | on | off | off |
| Position 3 | on | on | on | off |
| Position 4 | on | on | on | on |

It is to be noted that the total extent of

movement of the non-conducting member can be relatively small compared to the extent of movement required in the embodiment of Figure 1.

The Air ionisers according to the invention an,
5 therefore, permit control of ion emission strength in a relatively simple manner without expensive switching of the high voltage or any change in the electrical circuitry.

CLAIMS

1. An air ioniser having two or more ion emitter points, at least two of said emitter points being connected to a different high voltage, and means for selectively exposing one or more of the emitter points.
2. An air ioniser as claimed in claim 1, wherein the source of the different voltages is a voltage multiplier circuit, wherein a range of voltages are present on nodes of the circuit.
3. An air ioniser as claimed in claim 1 or claim 2, wherein the means for selectively exposing said emitters comprises a non-conducting member movement of which will expose emitter points according to the extent of movement thereof.
4. An air ioniser as claimed in claim 3, wherein the movement of the non-conducting member uncovers one or more emitter points.
5. An air ioniser as claimed in claim 3, wherein the movement of the non-conducting member aligns one or more apertures of the non-conductive member with one or more emitter points.
6. An air ioniser as claimed in claim 5, wherein for a linear arrangement of emitter points, the non-conductive member is arranged for sliding movement to expose the emitter points sequentially.

7. An air ioniser as claimed in claim 5, wherein a slidable non-conductive member is provided with a series of spaced apertures sized so that lateral movement thereof relative to the emitter points will expose one,
5 two, three etc points according to the extent of said movement.

3. An air ioniser as claimed in any of one of claims 1 to 7, wherein the first emitter point to be exposed will be at the lowest voltage and each successively
10 exposed emitter point will be at a higher voltage than the previously exposed emitter point.

9. An air ioniser substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

**Patents Act 1977
Examiner's report to the Comptroller under
Section 17 (The Search Report)**

Application number

9120402.4

Relevant Technical fields

(i) UK Cl (Edition K) H1X - X5E, X5Y

(ii) Int Cl (Edition 5) H01T

Databases (see over)

(i) UK Patent Office

(ii)

Search Examiner

R H LITTLEMORE

Date of Search

29 JANUARY 1992

Documents considered relevant following a search in respect of claims 1-9

| Category (see over) | Identity of document and relevant passages | Relevant to claim(s) |
|------------------------|--|-------------------------|
| Y | GB 1227607 (GRAF VON BERCKHEIM) SEE FIGURES 1 AND 2 | 1, 3, 4, 5 |
| Y | US 4523082 (STURDEVANT) SEE FIGURES 2 AND 3 | 1, 5 |
| Y | US 4366525 (BAUMGARTNER) SEE ADJUSTABLE BALL NOZZLES 10, FIGURE 2 | 1, 3, 4, 5 |



| Category | Identity of document and relevant passages | Relevant to claim(s) |
|----------|--|----------------------|
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Categories of documents

X: Document indicating lack of novelty or of inventive step.

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E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

&: Member of the same patent family, corresponding document.

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