CLAIMS

[Claim 1] An apparatus for producing negative air ions from a plant, comprising:

- a power supply module, wherein the power supply module comprises a transformer with a primary side and a secondary side, and a voltage stabilizing circuit connected to both the primary side and the secondary side so as to bridge an isolation gap of the transformer;
- a voltage pulse module connectable to the power supply module, the power supply module being configured to provide a pre-determined input voltage V_{IN} to the voltage pulse module for generating a negative voltage pulse, and to adjust a reflected voltage pulse from the voltage pulse module; and
- a stimulating probe connected to the voltage pulse module and configured to transmit the negative voltage pulse to a root portion of the plant.

[Claim 2] The apparatus according to claim 1, wherein the voltage stabilizing circuit comprises one or more bleed resistors of a pre-determined resistance value.

[Claim 3] The apparatus according to claim 2, wherein a lower limit of the resistance value of the one or more bleed resistors is determined based on a perceptible threshold of leakage current strength, and an upper limit of the resistance value of the one or more bleed resistors is determined based on an operational condition of the transformer.

[Claim 4] The apparatus according to claim 2 or 3, wherein the voltage stabilizing circuit further comprises a circuit protection device.

[Claim 5] The apparatus according to claim 1, wherein the power supply module comprises a power outlet interface for connecting to a power cable configured to transmit the input voltage V_{IN} to the voltage pulse module.

[Claim 6] The apparatus according to claim 5, wherein the power outlet interface is a USB receptacle configured to receive a USB connector of the power cable.

[Claim 7] The apparatus according to claim 1, wherein the power supply module comprises a power inlet interface configured to connect to a two-pin power socket, and/or a three-pin power socket.

[Claim 8] The apparatus according to claim 7, wherein a reference line at the secondary side of the transformer is connected to an earth grounding pin of the three-pin power socket.

[Claim 9] The apparatus according to claim 1, further comprising a proximity sensing module configured to detect an intruding subject in the vicinity of the plant.

[Claim 10] The apparatus according to claim 9, wherein the proximity sensing module comprises one or more of the following proximity sensors: active infrared proximity sensor, passive infrared proximity sensor, radio frequency proximity sensor, laser proximity sensor, time-of-flight (ToF) proximity sensor, inductive proximity sensor, capacitive proximity sensor.

[Claim 11] The apparatus according to claim 1, further comprising a touch sensing module configured to detect a subject coming in contact with the plant.

[Claim 12] The apparatus according to any one of claims 9 to 11, further comprising a controller configured to control operation of the apparatus based on data from the proximity sensing module or from the touch sensing module.

[Claim 13] The apparatus according to claim 1, wherein the apparatus comprises a housing configured to contain at least the voltage pulse module and to receive a plant pot.

[Claim 14] The apparatus according to claim 13, wherein the first surface comprises a concave portion sized and shaped to receive a bottom part of the plant pot.

[Claim 15] The apparatus according to claim 13 or 14, wherein the apparatus comprises at least two proximity sensors mounted on a peripheral edge of the housing in a symmetrical manner for forming a proximity sensing zone.

[Claim 16] The apparatus according to claim 1, wherein the voltage pulse module is configured to attach to a side wall of a plant pot.

[Claim 17] The apparatus according to claim 16, wherein the voltage pulse module is shaped and dimensioned to fit in a cavity on the plant pot.

[Claim 18] The apparatus according to claim 17, wherein the voltage pulse module comprises a clip for attaching to the side wall of the plant pot.

[Claim 19] The apparatus according to claim 18, wherein one clip arm of the clip is configured to transmit the negative voltage pulse to the root portion of the plant.

[Claim 20] The apparatus according to claim 1, wherein the apparatus is configured to connect to a power source mounted on a ceiling surface, and a plurality of sling cables are configured to hold a plant pot in a suspended position, wherein at least one of the plurality of sling cables is configured to transmit the predetermined input voltage V_{IN} from the power supply module to the voltage pulse module.

[Claim 21] The apparatus according to claim 1, wherein the apparatus is configured to connect to a power source mounted on a ceiling surface, and a plurality of sling cables are configured to hold a plant pot in a suspended position, wherein at least one of the plurality of sling cables is configured to transmit the negative voltage pulse from the voltage pulse module to the stimulating probe.

[Claim 22] The apparatus according to claim 1, wherein the pre-determined input voltage V_{IN} is between 3.3V and 100V.

[Claim 23] The apparatus according to claim 1, wherein a voltage level of the negative voltage pulse is between -2kV and -48kV.

[Claim 24] A power supply device comprising a transformer with a primary side and a secondary side, and a voltage stabilizing circuit connected to both the primary side and the secondary side so as to bridge an isolation gap of the transformer,

(a) wherein the power supply device is suitable for use with:

(i) a voltage pulse module connectable to the power supply device; and

(ii) a stimulating probe connected to the voltage pulse module and configured to transmit a negative voltage pulse to a root portion of a plant for producing negative air ions from the plant;

(b) wherein the power supply device is configured to:

(i) provide a pre-determined input voltage V_{IN} to the voltage pulse module for generating the negative voltage pulse; and

(ii) adjust a reflected voltage pulse from the voltage pulse module; and

(c) wherein the voltage stabilizing circuit comprises one or more bleed resistors of a pre-determined resistance value.

[Claim 25] The power supply device according to claim 24, wherein a lower limit of the resistance value of the one or more bleed resistors is determined based on a perceptible threshold of leakage current strength, and an upper limit of the resistance value of the one or more bleed resistors is determined based on an operational condition of the transformer.

[Claim 26] The power supply device according to claim 24 or 25, wherein the voltage stabilizing circuit further comprises a circuit protection device.

[Claim 27] The power supply device according to claim 24 further comprising at least one of:

- an input rectifying and filtering circuit at the primary side; and
- an output rectifying and filtering circuit at the secondary side.

[Claim 28] The power supply device according to claim 24 further comprising a power outlet interface for connecting to a power cable configured to transmit the input voltage V_{IN} to the voltage pulse module.

[Claim 29] The power supply device according to claim 28, wherein the power outlet interface is a USB receptacle configured to receive a USB connector of the power cable.

[Claim 30] The power supply device according to claim 24 further comprising a power inlet interface for connecting to a two-pin power socket, and/or a three-pin power socket.

[Claim 31] The power supply device according to claim 30, wherein a reference line at the secondary side of the transformer is connected to an earth grounding pin of the three-pin power socket.

[Claim 32] The power supply device according to claim 24, wherein the power supply device is configured to derive a predetermined input voltage V_{IN} of between 3.3V and 100V for the voltage pulse module.