Claims

What is claimed is:

1. A temperature control device comprising:

a medium pipe formed of a conductive material and configured to accommodate and circulate a polar medium;

a casing accommodating the medium pipe, the casing being electrically insulated from the medium pipe or electrically connected to the medium pipe through a resistor; and

an electrostatic rectifier comprising an output end electrically connected to the medium pipe and a circuit configured to transmit, from the output end to the medium pipe, a pulsed attenuated-wave signal repeated at a frequency of not less than 20 kHz and not more than 60 kHz, thereby supplying free electrons to the polar medium through the medium pipe.

2. The temperature control device according to claim 1, wherein an oscillation frequency within each attenuated wave is not less than 2 MHz and not more than 10 MHz.

3. The temperature control device according to claim 1, wherein the temperature control device is an air-conditioning device.

4. An electrostatic rectifier for a temperature control device, comprising:

an output end configured to be electrically connected to a medium pipe; and

a circuit configured to transmit, from the output end to the medium pipe, a

pulsed attenuated-wave signal repeated at a frequency of not less than 20 kHz and not more than 60 kHz, thereby supplying free electrons to a polar medium contained in the medium pipe through the medium pipe.

5. The electrostatic rectifier according to claim 4, wherein an oscillation frequency within each attenuated wave is not less than 2 MHz and not more than 10 MHz.

6. A method for improving the efficiency of a temperature control device comprising a medium pipe formed of a conductive material and configured to accommodate and circulate a polar medium, and a casing accommodating the medium pipe, the casing being electrically insulated from the medium pipe or electrically connected to the medium pipe through a resistor,the temperature control device further comprising an electrostatic rectifier having a circuit with an output end electrically connected to the medium pipe,

the method comprising transmitting, by the electrostatic rectifier, a pulsed attenuated-wave signal repeated at a frequency of not less than 20 kHz and not more than 60 kHz to the medium pipe, thereby supplying free electrons to the polar medium through the medium pipe.

7. The method according to claim 6, wherein the attenuated-wave signal supplied to the medium pipe has an oscillation frequency within each attenuated wave of not less than 2 MHz and not more than 10 MHz.

8. The method according to claim 6, wherein the temperature control device is an air-conditioning device.