bacteria trapping device capable of trapping floating bacteria in the air continuously for a long time without decreasing trapping efficiency even if the time before a trapping carrier being replaced is prolonged and a floating bacteria counting method and a floating bacteria counting system using the floating bacteria trapping device.

Another object of the present invention is to provide a floating bacteria counting method and a floating bacteria counting system capable of counting only living organism quickly and accurately.

Summary

[0009a]

In a first aspect, there is provided a floating bacteria trapping device having a nozzle allowing air to pass through, a trapping carrier provided downstream of the nozzle to catch floating bacteria in the air having passed through the nozzle, and a support container supporting the trapping carrier, comprising: a driving mechanism that causes the support container to move in a horizontal direction so that trajectories drawn by center points of regions on the trapping carrier against which the air having passed through the nozzle collides do not intersect, the nozzle being formed of a plurality of pinholes arranged at equal intervals, and wherein a pitch interval between the pinholes is d, the driving mechanism causes the support container to move in the horizontal direction so that the support container draws a circle of less than d in diameter.

[0009b]

In a second aspect, there is provided a floating bacteria counting method of counting living organisms trapped by a trapping carrier by causing air to collide against the trapping carrier to trap floating bacteria and analyzing the trapping carrier, wherein if floating bacteria are trapped by the trapping carrier mounted on a floating bacteria trapping device as disclosed herein while replacing the trapping carrier mounted on the floating bacteria trapping device, the trapping carrier mounted on the floating bacteria trapping device when particles floating in the air are detected by a particle counting device that counts particles floating in the air in a room in which the floating bacteria trapping device is arranged is the trapping carrier to be analyzed.

[0009c]

In a third aspect, there is provided a floating bacteria counting method of counting living organisms trapped by a trapping carrier by analyzing the trapping carrier mounted on a floating bacteria trapping device as disclosed herein trapping floating bacteria in air while causing a support container supporting the trapping carrier to move in a horizontal direction so that trajectories drawn by center points of regions on the trapping carrier against which the air collides do not intersect, wherein if floating bacteria are trapped by the trapping carrier mounted on the floating bacteria trapping device while replacing the trapping carrier mounted on

the floating bacteria trapping device, the trapping carrier mounted on the floating bacteria trapping device when particles floating in the air are detected by a particle counting device that counts particles floating in the air in a room in which the floating bacteria trapping device is arranged is the trapping carrier to be analyzed.

[0009d]

In a fourth aspect, there is provided a floating bacteria counting method of counting living organisms trapped by a trapping carrier by analyzing the trapping carrier mounted on a floating bacteria trapping device as disclosed herein trapping floating bacteria in air having passed through a nozzle while causing a support container supporting the trapping carrier to move in a horizontal direction so that trajectories drawn by center points of regions on the trapping carrier against which the air having passed through the nozzle collides do not intersect, comprising: a trapping start signal transmitting step of transmitting a trapping start instruction signal to the floating bacteria trapping device when a particle counting device that counts particles floating in the air in a room in which the floating bacteria trapping device is arranged detects particles floating in the air equal to a threshold or more; a trapping start step of starting trapping of floating bacteria in the air from a time when the floating bacteria trapping device receives the trapping start instruction signal; and a living organism counting step of counting living organisms trapped by the trapping carrier by analyzing the trapping carrier when a preset time passes after the trapping is started.

[0009e]

In a fifth aspect, there is provided a floating bacteria counting system that includes the floating bacteria trapping device and the particle counting device that counts particles floating in air in a room in which the floating bacteria trapping device is arranged as disclosed herein and counts living organisms caught by a trapping carrier by trapping floating bacteria in the air by the trapping carrier mounted on the floating bacteria trapping device while replacing the trapping carrier mounted on the floating bacteria trapping device and analyzing the trapping carrier, wherein the trapping carrier mounted on the floating bacteria trapping device when particles floating in the air are detected by the floating bacteria trapping device is the trapping carrier to be analyzed.

[0009f]

In a sixth aspect, there is provided a floating bacteria counting system that includes a floating bacteria trapping device and a particle counting device that counts particles floating in air in a room in which the floating bacteria trapping device is arranged as disclosed herein and counts living organisms caught by a trapping carrier by trapping floating bacteria in the air by the trapping carrier mounted on the floating bacteria trapping device, wherein the particle counting device includes: a trapping start instruction signal transmitting unit that transmits a trapping start instruction signal to the floating bacteria trapping device when

particles floating in the air equal to a threshold or more are detected and the floating bacteria trapping device includes: a trapping start unit that starts trapping of floating bacteria in the air when the trapping start instruction signal is received; and a trapping continuation unit that that continues the trapping until a preset time passes after the trapping is started by the trapping start unit.

Solution to Problem

[0010]

In order to achieve the above object, a floating bacteria trapping device according to the present invention having a nozzle allowing air the pass through, a trapping carrier provided downstream of the nozzle to catch floating bacteria in the air having passed through the nozzle, and a support container supporting the trapping carrier, includes a driving mechanism that causes the support container to move in a horizontal direction so that trajectories drawn by center points of regions on the trapping carrier against which the air having passed through the nozzle collides do not intersect.

[0011]

According to the above configuration, the floating bacteria trapping device includes the driving mechanism that causes the support container to move in the horizontal direction

transmitting step of transmitting a trapping start instruction signal to the floating bacteria trapping device when a particle counting device that counts particles floating in the air in a room in which the floating bacteria trapping device is arranged detects particles floating in the air equal to a threshold or more, a trapping start step of starting trapping of floating bacteria in the air from a time when the floating bacteria trapping device receives the trapping start instruction signal, and a living organism counting step of counting living organisms caught by the trapping carrier by analyzing the trapping carrier when a preset time passes after the trapping is started.

[0025]

According to the present invention, useless trapping and time and efforts of analysis can be saved by a trapping operation by a floating bacteria counting device being started after detection of particles by a particle counting device so that only living organisms can be counted quickly and accurately.

[0026]

In addition, according to the present invention, there is provided a floating bacteria counting system that includes the floating bacteria trapping device and the particle counting device that counts particles floating in air in a room in which the floating bacteria trapping device is arranged according to any one of claims 1 to 23 and counts living organisms caught by a trapping carrier by trapping floating bacteria in the air by the trapping carrier mounted on the floating bacteria trapping

In addition, according to the present invention, there is provided a floating bacteria counting system that includes the floating bacteria trapping device and the particle counting device that counts particles floating in air in a room in which the floating bacteria trapping device is arranged according to any one of claims 1 to 23 and counts living organisms caught by a trapping carrier by trapping floating bacteria in the air by the trapping carrier mounted on the floating bacteria trapping device, wherein the particle counting device includes a trapping start instruction signal transmitting unit that transmits a trapping start instruction signal to the floating bacteria trapping device when particles floating in the air equal to a threshold or more are detected, and the floating bacteria trapping device includes a trapping start unit that starts trapping of floating bacteria in the air when the trapping start instruction signal is received, and a trapping continuation unit that that continues the trapping until a preset time passes after the trapping is started by the trapping start unit.

Advantageous Effects of Invention

[0030]

According to the present invention, a floating bacteria trapping device includes a driving mechanism that causes a support container to move in the horizontal direction so that trajectories drawn by center points of regions on a trapping carrier against which the air having passed through a nozzle