CLAIMS

[Claim 1] A photocatalytic device comprising:

a metallic photocatalytic filter having a surface on which a photocatalyst is carried, the photocatalytic filter being formed of a corrugated member made of a metal material and having a plurality of ridges and a plurality of valleys alternately arranged, the photocatalytic filter having light-passing holes that allow ultraviolet light or visible light to pass therethrough, at top portions of the ridges and bottom portions of the valleys;

a light irradiation unit configured to irradiate one of front and rear surfaces of the photocatalytic filter with ultraviolet light or visible light;

a reflection wall facing the other one of the front and rear surfaces of the photocatalytic filter, the reflection wall reflecting light that has been emitted from the light irradiation unit and has passed through the light-passing holes of the ridges and the valleys of the photocatalytic filter, toward the other surface; and

a gas inflow part and a gas outflow part respectively provided at one end and the other end of the photocatalytic filter, the gas inflow part and the gas outflow part allowing a gas to flow in a space between the light irradiation unit and the photocatalytic filter and a space between the reflection wall and the photocatalytic filter, over the front and rear surfaces of the photocatalytic filter from the one end toward the other end along a direction in which the ridges and the valleys extend, wherein

the photocatalytic filter is rounded in a cylindrical shape around an axis parallel to a direction in which the ridges and the valleys extend, with one surface of the front and rear surfaces facing inward,

a metallic support member configured to support the photocatalytic filter at the one end or the other end is provided, wherein the support member supports the light irradiation unit, and

the gas, which has entered through the gas inflow part, flows from the one end of the photocatalytic filter toward the other end thereof along the direction in which the ridges and the valleys of the photocatalytic filter extend, and is discharged to an outside through the gas outflow part.

[Claim 2] The photocatalytic device according to claim 1 , wherein

the light irradiation unit comprises:

a light source disposed at a position corresponding to the one end or the other end of the photocatalytic filter; and

a light guide member having a light emitting surface facing the one of the surfaces of the photocatalytic filter, the light guide member taking light emitted from the light source, and applying the light to the one of the surfaces of the photocatalytic filter through the light emitting surface.

[Claim 3] The photocatalytic device according to any one of claims 1 to 2, wherein

the light-passing holes of the photocatalytic filter are through-grooves elongated in the direction in which the ridges and the valleys extend, and

upright pieces are formed at paired opening edges which extend along a longitudinal direction of each through-groove and are opposed each other, the upright pieces being cut and raised for forming the through-groove and being erected at a projecting surface of the ridge or the valley.