CLAIMS

[Claim 1]

A dust collecting device, comprising:

a housing accommodating an air passage that allows air to pass through the air passage;

a film electrically charged by friction and conveyed along a path that crosses the air passage;

an unwinder configured to supply the film into the air passage;

a friction body configured to apply friction to the film fed from the unwinder to electrically charge the film;

a winder configured to wind, onto the winder, the film conveyed into the air passage; and

a grounded conductor disposed in contact with the film to be conveyed, the grounded conductor being opposite the friction body, with the film interposed between the grounded conductor and the friction body.

[Claim 2]

The dust collecting device of claim 1, further comprising a controller configured to regularly execute a film change mode in which the film conveyed into the air passage is wound onto the winder and an unused part of the film is supplied from the unwinder into the air passage.

[Claim 3]

The dust collecting device of claim 2, further comprising a particle sensor configured to detect a concentration of particles to be collected in the air that passes through the air passage,

wherein the controller is configured to execute the film change mode on a basis of the detected concentration.

[Claim 4]

The dust collecting device of claim 3, wherein the particle sensor is provided each upstream and downstream of the air passage, and

the controller is configured to execute the film change mode when a collecting efficiency calculated from concentrations detected by the particle sensors falls below a threshold.

[Claim 5]

The dust collecting device of any one of claims 1 to 4, further comprising a partition disposed between the air passage and the unwinder.

[Claim 6]

The dust collecting device of any one of claims 1 to 5, further comprising a plurality of guides configured to guide the film to allow the film to cross the air passage multiple times.

[Claim 7]

The dust collecting device of any one of claims 1 to 6, further comprising:

a first film unit including a first film positively charged by friction with the friction body, an unwinder configured to supply the first film, and a winder configured to wind the first film onto the winder; and

a second film unit including a second film negatively charged by friction with the friction body, an unwinder configured to supply the second film, and a winder configured to wind the second film onto the winder,

wherein the first film unit and the second film unit are disposed to allow the first film and the second film to face each other in the air passage.

[Claim 8]

The dust collecting device of claim 7, wherein the friction body includes

a first friction body configured to apply friction to the first film, and

a second friction body configured to apply friction to the second film, the second friction body having a stronger tendency to be positively charged than does the first friction body.

[Claim 9]

The dust collecting device of any one of claims 1 to 8, further comprising a drying unit configured to dry the film before the friction body applies friction to the film.

[Claim 10]

The dust collecting device of any one of claims 1 to 9, further comprising an air filter disposed downstream in the air passage.

[Claim 11]

An air-conditioning apparatus, comprising:

a housing accommodating an air passage that allows air to pass through the air passage;

a film conveyed along a path that crosses the air passage and electrically charged by friction;

an unwinder configured to supply the film into the air passage;

a friction body configured to apply friction to the film fed from the unwinder to electrically charge the film;

a winder configured to wind, onto the winder, the film electrically charged and conveyed into the air passage;

an air sending unit configured to generate an air flow that passes through the air passage; and

a grounded conductor disposed in contact with the film to be conveyed, the grounded conductor being opposite the friction body, with the film interposed between the grounded conductor and the friction body.

[Claim 12]

The air-conditioning apparatus of claim 11, wherein the air-conditioning apparatus is installed inside a ceiling in a room.