CLAIMS

1. A concrete finishing device comprising:

a traveling unit having an endless track provided on a frame;

an electrical power source unit mounted to the frame and supplying electrical power to the traveling unit;

a finishing unit coupled to the frame of the traveling unit or the electrical power source unit and finishing a concrete surface with a finishing mechanism rotating while in contact with the concrete surface;

a first coupling unit removably coupling the finishing unit to the frame of the traveling unit or the electrical power source unit; and

a second coupling unit removably coupling the electrical power source unit to the frame of the traveling unit,

the traveling unit is disposed so as to drag the finishing unit, and

the first coupling unit has an elastic member having flexibility along a vertical direction and is deformed in the vertical direction by a weight of the finishing unit so as to allow a relative movement of the finishing unit in the vertical direction with respect to the frame of the traveling unit or the electrical power source unit.

2. The concrete finishing device according to claim 1, wherein the first coupling unit removably couples the finishing unit to the frame of the traveling unit.

3. The concrete finishing device according to claim 1 or 2, further comprising:

a sensor unit obtaining information related to a state of the concrete surface; and

a control unit generating a control signal for at least one of the

traveling unit and the finishing unit by using the information obtained by the sensor unit.

4. The concrete finishing device according to claim 3, wherein

the finishing mechanism has a blade rotating while in contact with the concrete surface, a rotary shaft to which the blade is coupled, and a blade motor driving the rotary shaft, and

the blade is configured to be removable from the rotary shaft.

5. The concrete finishing device according to claim 4, wherein the control unit controls at least one of a movement speed of the traveling unit, a rotation speed of the blade, and a blade angle of the blade with respect to the concrete surface.

6. The concrete finishing device according to claim 4 or 5, wherein

the control unit has a leveling situation acquisition unit obtaining information related to a leveling situation of the concrete surface by using at least one of a movement speed of the traveling unit, a movement trajectory of the blade, a rotation speed of the blade, and a blade angle of the blade with respect to the concrete surface, and

the control unit generates the control signal by using the information obtained by the leveling situation acquisition unit.

7. The concrete finishing device according to any one of claims 4 to 6, wherein

the sensor unit has a surface sensor acquiring at least one of information related to smoothness of the concrete surface and information related to a degree of curing of the concrete surface as information related to the state of the concrete surface, and

the control unit generates the control signal by using the

information obtained by the surface sensor.

8. The concrete finishing device according to any one of claims 4 to 7, wherein

the sensor unit further has an obstacle detection sensor detecting an obstacle present such that a movement by the traveling unit is hindered on the concrete surface, and

the obstacle detection sensor includes:

a contact sensor detecting the obstacle by contact with the obstacle; and

a non-contact sensor detecting the obstacle without contact by emitting a transmission wave to the obstacle and using a reflected wave from the obstacle.

9. The concrete finishing device according to any one of claims 1 to 3, wherein the finishing mechanism is a cylinder member in which a contact portion coming into contact with the concrete surface has an air gap and levels the concrete surface by rotating around a rotation axis of the cylinder member as the traveling unit travels.

10. The concrete finishing device according to any one of claims 1 to 3, wherein

the finishing mechanism includes:

a first blade in which a contact portion coming into contact with the concrete surface is flexible; and

a second blade in which a contact portion coming into contact with the concrete surface is higher in rigidity than the first blade and the contact portion has a convex surface-shaped surface, and

the first blade and the second blade are selectively mounted onto

the finishing mechanism in accordance with content of finishing work.

11. The concrete finishing device according to any one of claims 1 to 10, wherein

the traveling unit is electrically connected to the electrical power source unit and the endless track is driven by a first motor performing driving by using electrical power supplied from the electrical power source unit, and

the finishing unit is electrically connected to the electrical power source unit and the finishing mechanism is driven by a second motor performing driving by using electrical power supplied from the electrical power source unit.

12. The concrete finishing device according to any one of claims 1 to 11, wherein

the traveling unit has a concrete adhesion suppression unit suppressing adhesion of the concrete to a contact surface of the endless track coming into contact with the concrete surface, and

the concrete adhesion suppression unit supplies an adhesion suppression substance to the contact surface.