charging units, a controller, and a manager. The charging units are electrically connected to each other via a trunk distribution line, and each of the charging units comprises a connector to which a vehicle is connected, a storage battery that stores therein power supplied from the trunk distribution line, and a charger that supplies power supplied from the trunk distribution line or the storage battery to the vehicle through the connector. The controller controls the charging units. The manager manages the storage battery of each of the charging units with partitioning the storage battery into a plurality of blocks in a unit of given electric energy. The manager assigns a first state, a second state, or a third state to each of the blocks, and outputs, when the charging units includes a first charging unit including a first block to which the first state is assigned, an instruction to the controller such that power stored in the first block is distributed to a second charging unit other than the first charging unit via the trunk distribution line. The first state indicates that none of the charging units uses the first block. The second state indicates that any of the charging units uses a block to which the second state is assigned. The third state indicates that usable power is not stored in a block to which the third state is assigned.

BRIEF DESCRIPTION OF DRAWINGS

[0006] FIG. 1 is a block diagram illustrating an example of an overall configuration of an EV charging system according to an embodiment.

FIG. 2 is a block diagram illustrating an example of an internal configuration of each of storage batteries of the EV charging system in the embodiment.

FIG. 3 is a diagram for explaining an example of states 1 to 4 that are assigned to respective blocks of the storage batteries of the EV charging system in the

examples of a "second state", and the state 3 is an example of a "third state".

[0023] The charge/discharge instruction generator 40 manages the above-mentioned states on the basis of charging unit information input from the charging units 10. The charging unit information is information indicating operation conditions of the storage batteries 12, the chargers 13, and the power conditioners 14, and includes information indicating the remaining capacities of the storage batteries 12 (electric energies in the respective blocks B). The charge/discharge instruction generator 40 is configured to monitor the charging unit information input from the respective charging units 10 and to update the states in accordance with update contents when the charging unit information are updated.

[0024] As described above, any one of the state 1, the states 2 and 4, and the state 3 is assigned to each of the blocks B, the state 1 indicating that none of the charging units 10 uses the block B to which the state 1 is assigned, the states 2 and 4 indicating a use by any of the charging units 10 that any of the charging units 10 uses the block B to which the second state 2 and 4 is assigned, the state 3 indicating that usable power is not stored in the block B to which the state 3 is assigned. With this assignment, the charge/discharge instruction generator 40 can determine whether the storage batteries 12 of the other charging units 10 have surplus power by checking the presence or absence of the block B to which the state 1 has been assigned (hereinafter, referred to as a first block) when executing the above-described power distribution control.

[0025] In the embodiment, when there is a plurality of charging units 10 having the first blocks, the charge/discharge instruction generator 40 outputs the vehicle charge instruction and the discharge instruction to the controllers 20 so that power is distributed to another charging unit 10 preferentially from the charging unit 10

CLAIMS

1. A charging system comprising:

a plurality of charging units that are electrically connected to each other via a trunk distribution line, the charging units each comprising a connector to which a vehicle is connected, a storage battery that stores therein power supplied from the trunk distribution line, and a charger that supplies power supplied from the trunk distribution line or the storage battery to the vehicle through the connector;

a controller that controls the charging units; and

a manager that manages the storage battery of each of the charging units with partitioning the storage battery into a plurality of blocks in a unit of given electric energy, that assigns a first state, a second state, or a third state to each of the blocks, and that outputs, when the charging units includes a first charging unit including a first block to which the first state is assigned, an instruction to the controller such that power stored in the first block is distributed to a second charging unit other than the first charging unit via the trunk distribution line, the first state indicating that none of the charging units uses the first block, the second state indicating that any of the charging units uses a block to which the second state is assigned, the third state indicating that usable power is not stored in a block to which the third state is assigned.

2. The charging system according to claim 1, wherein

when the first charging unit comprises a plurality of first charging units, the manager outputs the instruction such that power is distributed to the second charging unit preferentially from the first charging unit comprising the largest number of first blocks.