

CLAIMS

1. A communication system comprising a traveling cart traveling in a predetermined traveling area in a building, a wireless base station, and a controller that
5 communicates with the traveling cart via the wireless base station, wherein
the traveling cart comprises:
a cart wireless communication unit that performs wireless communication with
the wireless base station; and
a cart control unit that is capable of transmitting traveling position information
10 indicating a traveling position of the traveling cart itself in the traveling area to the
wireless base station via the cart wireless communication unit,
the wireless base station comprises:
a first wireless base station communication unit that performs wireless
communication with the traveling cart; and
15 a second wireless base station communication unit that performs
communication with the controller,
the controller comprises:
a controller communication unit that communicates with the wireless base
station;
20 a controller storage unit that stores a transmission rate table designating
correspondence relationships between respective position information indicating a
plurality of positions where the traveling cart can travel in the traveling area and at least
one transmission rate recommended for wireless communication performed by the
traveling cart and the wireless base station when the traveling cart is at each of the
25 positions; and

a controller control unit that acquires at least one transmission rate from the transmission rate table based on the position information corresponding to the traveling position information of the traveling cart received via the wireless base station, generates transmission rate information from the transmission rate which is acquired, and transmits
5 the transmission rate information which is generated and transmission information for being transmitted to the traveling cart to the wireless base station via the controller communication unit, and

when the wireless base station receives the transmission rate information and the transmission information by communication between the second wireless base station
10 communication unit and the controller communication unit, the wireless base station transmits the transmission information to the traveling cart at the transmission rate acquired from the transmission rate information, via the first wireless base station communication unit.

15 2. The communication system according to claim 1, wherein

the wireless base station transmits the transmission information and the transmission rate information to the traveling cart via the first wireless base station communication unit, and

the cart wireless communication unit performs wireless communication with
20 the wireless base station at the transmission rate which is acquired from the transmission rate information received from the wireless base station.

3. The communication system according to claim 1, wherein

the cart wireless communication unit performs wireless communication with
25 the wireless base station at the same transmission rate as that used by the wireless base

station when the cart wireless communication unit performed communication with the wireless base station.

4. The communication system according to any one of claims 1 to 3, wherein

5 the controller control unit of the controller comprises:

a communication quality acquisition unit acquires a communication quality when the wireless base station and the traveling cart perform wireless communication at the transmission rate which is recommended corresponding to the position of the traveling cart, as communication quality information; and

10 a transmission rate table updating unit updates the transmission rate table stored in the controller storage unit based on the communication quality information acquired by the communication quality acquisition unit.

5. The communication system according to any one of claims 1 to 4, wherein

15 the wireless base station includes a wireless base station control unit that acquires the transmission rate from the transmission rate information received from the controller via the second wireless base station communication unit, and

when there are a plurality of transmission rates acquired from the transmission rate information by the wireless base station control unit, the first wireless base station
20 communication unit transmits the transmission information to the traveling cart at the transmission rate selected from the plurality of transmission rates.

6. The communication system according to any one of claims 1 to 5, wherein

the controller can communicate with a plurality of the wireless base stations via
25 the controller communication unit, and

when it is necessary to switch the wireless base station that is a wireless communication partner of the traveling cart due to the traveling position of the traveling cart, the controller control unit transmits the transmission rate information corresponding to the position where the traveling cart is traveling, and the transmission information, to
5 the wireless base station which is a switching destination of the wireless communication partner of the traveling cart via the controller communication unit.

7. The communication system according to any one of claims 1 to 6, wherein
in advance, the traveling cart performs wireless communication with the
10 wireless base station at each of the positions and at each of a plurality of different transmission rates, and

the transmission rate table is created by associating at least one transmission rate used for the wireless communication that was able to communicate at a quality higher than a predetermined level and the position information for each of the positions.

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8. The communication system according to any one of claims 1 to 7, wherein
the transmission rate information and the transmission information are described in a communication frame transmitted by the controller communication unit to the wireless base station.

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9. The communication system according to claim 8, wherein
both the transmission rate information and the transmission information are described in a data body part in the communication frame.

25 10. A communication method used by a communication system comprising a

traveling cart traveling in a predetermined traveling area in a building, a wireless base station, and a controller that communicates with the traveling cart via the wireless base station, the communication method comprising:

5 a traveling position information notification process in which the traveling cart transmits traveling position information indicating the traveling position of the traveling cart itself in the traveling area to the wireless base station;

a transmission rate instruction process in which, based on the traveling position information of the traveling cart received by the controller via the wireless base station, the controller transmits transmission rate information indicating at least one transmission
10 rate recommended for wireless communication with the wireless base station when the traveling cart is at the traveling position indicated by the traveling position information to the wireless base station; and

a communication process in which the wireless base station performs wireless communication with the traveling cart at the transmission rate acquired from the
15 transmission rate information received from the controller.