CLAIMS

1. A plate-shaped member transfer facility comprising:

a rack configured to store a plurality of plate-shaped members, which are supported by a support so as to be raised and extend in a conveying direction, such that the plurality of plate-shaped members stored in the rack are arranged in an arrangement direction crossing the conveying direction, the rack being configured to allow each of the plurality of plate-shaped members to be carried into and out of the rack in the conveying direction through an insertion opening; and

a plate-shaped member transfer mechanism configured to carry each plate-shaped member into or out of the rack in the conveying direction through the insertion opening, wherein

the plate-shaped member transfer mechanism includes:

a flip rotation mechanism positioned in track-side space facing the insertion opening of the rack, the flip rotation mechanism including a flip configured to support the plate-shaped member and be rotatable around a rotation axis parallel to the conveying direction, the flip rotation mechanism being configured to rotate the flip such that the plate-shaped member on a conveyor is placed on the flip and raised, or rotate the flip such that the plate-shaped member on the flip is laid down and placed on the conveyor;

a conveyance mechanism extending in the conveying direction and including a sender configured to send, in the conveying direction, the plate-shaped member that has been raised by the flip rotation mechanism; and

a moving mechanism configured to move the flip rotation mechanism and the conveyance mechanism in the arrangement direction, and

the conveyance mechanism is configured to transfer the plate-shaped member in the raised state between the track-side space and the rack by means of the sender.

2. The plate-shaped member transfer facility according to claim 1, wherein the conveyance mechanism includes: a track-side sending part serving as the

sender; a track-side conveyance mechanism disposed in the track-side space; a rack-side sending part serving as the sender; and a rack-side conveyance mechanism disposed at the rack.

3. The plate-shaped member transfer facility according to claim 2, wherein

the track-side conveyance mechanism and the rack-side conveyance mechanism are configured to transfer the plate-shaped member in the raised state between the track-side sending part and the rack-side sending part.

4. The plate-shaped member transfer facility according to claim 2, wherein

the moving mechanism includes: a track-side moving mechanism configured to move the track-side conveyance mechanism in the arrangement direction; and a rack-side moving mechanism configured to move the rack-side conveyance mechanism in the arrangement direction.

5. The plate-shaped member transfer facility according to claim 2, wherein

the track-side moving mechanism is configured to move the track-side conveyance mechanism and the flip rotation mechanism together in the arrangement direction.

6. The plate-shaped member transfer facility according to claim 2, wherein

the rack includes a plurality of support members,

the plurality of support members are arranged to be spaced apart from each other in the conveying direction, and are configured to support the plate-shaped member at upper surfaces of the respective support members,

the rack-side sending part includes a rack-side driving member configured to send the plate-shaped member by moving the plate-shaped member on a face of the rack-side sending part, and

the rack-side conveyance mechanism is configured to lift and lower the

rack-side sending part between a rack-side conveyance position and a rack-side standby position, the rack-side conveyance position being a position at which the face of the rack-side sending part is positioned higher than the upper surfaces of the support members, the rack-side standby position being a position at which the face of the rack-side sending part is positioned lower than the upper surfaces of the support members.

7. The plate-shaped member transfer facility according to claim 6, wherein

the track-side sending part includes a track-side driving member configured to send the plate-shaped member by moving the plate-shaped member on a face of the track-side sending part, and

the track-side conveyance mechanism is configured to lift and lower the track-side sending part between a track-side conveyance position and a standby position, the track-side conveyance position being a position at which the face of the track-side sending part is positioned at a height that is substantially the same as a height of the face of the rack-side sending part when the rack-side sending part is at the rack-side conveyance position, the standby position being a position at which the face of the track-side sending part is positioned lower than the upper surfaces of the support members.

8. The plate-shaped member transfer facility according to claim 2, further comprising a position detection sensor configured to detect whether the track-side sending part and the rack-side sending part are aligned in the conveying direction, wherein

the track-side sending part and the rack-side sending part are configured to perform transfer of the plate-shaped member when the position detection sensor detects that the track-side sending part and the rack-side sending part are aligned in the conveying direction.

9. The plate-shaped member transfer facility according to claim 1, wherein the flip rotation mechanism is configured to rotate the flip to lay down the plate-shaped member supported by the flip when the flip rotation mechanism is moved by the moving mechanism.

10. The plate-shaped member transfer facility according to claim 1, wherein the flip includes a plurality of rollable spherical rollers, and is configured to support a rear surface of the plate-shaped member by means of the plurality of spherical rollers.

CLAIMS

[1] A plate-shaped member transfer facility comprising:

a rack configured to store a plurality of plate-shaped members, which are supported by a support so as to be raised and extend in a conveying direction, such that the plurality of plate-shaped members stored in the rack are arranged in an arrangement direction crossing the conveying direction, the rack being configured to allow each of the plurality of plate-shaped members to be carried into and out of the rack in the conveying direction through an insertion opening; and

a plate-shaped member transfer mechanism configured to carry each plate-shaped member into or out of the rack in the conveying direction through the insertion opening, wherein

the plate-shaped member transfer mechanism includes:

a flip rotation mechanism positioned in track-side space facing the insertion opening of the rack, the flip rotation mechanism including a flip configured to support the plate-shaped member and be rotatable around a rotation axis parallel to the conveying direction, the flip rotation mechanism being configured to rotate the flip to raise or lay down the plate-shaped member;

a conveyance mechanism extending in the conveying direction and including a sender configured to send, in the conveying direction, the plate-shaped member that has been raised by the flip rotation mechanism; and

a moving mechanism configured to move the flip rotation mechanism and the conveyance mechanism in the arrangement direction, and

the conveyance mechanism is configured to transfer the plate-shaped member in the raised state between the track-side space and the rack by means of the sender.

[2] The plate-shaped member transfer facility according to claim 1, wherein the conveyance mechanism includes: a track-side sending part serving as the sender; a track-side conveyance mechanism disposed in the track-side space; a rack-side sending part serving as the sender; and a rack-side conveyance mechanism disposed at the rack.

[3] The plate-shaped member transfer facility according to claim 2, wherein the track-side conveyance mechanism and the rack-side conveyance mechanism are configured to transfer the plate-shaped member in the raised state between the track-side sending part and the rack-side sending part.

[4] The plate-shaped member transfer facility according to claim 2, wherein the moving mechanism includes: a track-side moving mechanism configured to move the track-side conveyance mechanism in the arrangement direction; and a rack-side moving mechanism configured to move the rack-side conveyance mechanism in the arrangement direction.

[5] The plate-shaped member transfer facility according to claim 2, wherein the track-side moving mechanism is configured to move the track-side conveyance mechanism and the flip rotation mechanism together in the arrangement direction.

[6] The plate-shaped member transfer facility according to claim 2, wherein the rack includes a plurality of support members,
the plurality of support members are arranged to be spaced apart from each other

in the conveying direction, and are configured to support the plate-shaped member at upper surfaces of the respective support members,

the rack-side sending part includes a rack-side driving member configured to send the plate-shaped member by moving the plate-shaped member on a face of the rack-side sending part, and

the rack-side conveyance mechanism is configured to lift and lower the rack-side sending part between a rack-side conveyance position and a rack-side standby position, the rack-side conveyance position being a position at which the face of the rack-side sending part is positioned higher than the upper surfaces of the support members, the rack-side standby position being a position at which the face of the rack-side sending part is positioned lower than the upper surfaces of the support members.

[7] The plate-shaped member transfer facility according to claim 6, wherein

the track-side sending part includes a track-side driving member configured to send the plate-shaped member by moving the plate-shaped member on a face of the track-side sending part, and

the track-side conveyance mechanism is configured to lift and lower the track-side sending part between a track-side conveyance position and a standby position, the track-side conveyance position being a position at which the face of the track-side sending part is positioned at a height that is substantially the same as a height of the face of the rack-side sending part when the rack-side sending part is at the rack-side conveyance position, the standby position being a position at which the face of the track-side sending part is positioned lower than the upper surfaces of the support members.

[8] The plate-shaped member transfer facility according to claim 2, further comprising a position detection sensor configured to detect whether the track-side sending part and the rack-side sending part are aligned in the conveying direction, wherein

the track-side sending part and the rack-side sending part are configured to perform transfer of the plate-shaped member when the position detection sensor detects that the track-side sending part and the rack-side sending part are aligned in the conveying direction.

[9] The plate-shaped member transfer facility according to claim 1, wherein

the flip rotation mechanism is configured to rotate the flip to lay down the plate-shaped member supported by the flip when the flip rotation mechanism is moved by the moving mechanism.

[10] The plate-shaped member transfer facility according to claim 1, wherein the flip includes a plurality of rollable spherical rollers, and is configured to support a rear surface of the plate-shaped member by means of the plurality of spherical rollers.