CLAIMS

1. A transfer system comprising:

a transport vehicle configured to move along a rail provided on a ceiling for moving an article; and

a placement portion disposed below the rail, having a predetermined position on which the article can be placed; wherein

the transport vehicle has a transfer unit configured to hold the article on the placement portion and to place the article onto the placement portion,

the transfer unit is configured to transfer the article between the transport vehicle and the placement portion in a lateral transfer manner,

the transfer system further comprising:

a memory configured to store (i) placement position information indicating a transfer position of the article when the transfer unit is to place the article onto the placement portion, and (ii) holding position information indicating a transfer position of the article when the transfer unit is to hold the article on the placement portion; and

a controller configured to control the transfer unit such that, when the transfer unit is to place the article, the article is transferred at a transfer position indicated in the placement position information in the memory and, when the transfer unit is to hold the article, the article is transferred at a transfer position indicated in the holding position information in the memory.

2. The transfer system according to claim 1, wherein the placement position information and the holding position information are each indicated as sum of a common data indicating a transfer position common among a plurality of transport vehicles and a unique data indicating a transfer position unique to each transport vehicle.

3. The transfer system according to claim 2, wherein the difference between the unique data of the placement position information and the unique data of the holding position information

corresponds to an offset amount of the article calculated based on inclination degree of the article and a height of the article at the transfer position.

4. The transfer system according to claim 1, wherein

the transfer unit includes:

a holding unit configured to hold and release the article;

a vertical moving unit configured to move the holding unit in a vertical direction;

a lateral moving unit configured to move the holding unit in a lateral direction perpendicular to the direction of the rail; and

a rotation moving unit configured to rotate the holding unit around a vertical axis; wherein

each of the placement position information and the holding position information indicates positions in four directions including the direction of the rail, the lateral direction, the vertical direction, and the rotation direction around the vertical axis.

5. The transfer system according to claim 2, wherein

the transfer unit includes:

a holding unit configured to hold and release the article;

a vertical moving unit configured to move the holding unit in a vertical direction;

a lateral moving unit configured to move the holding unit in a lateral direction perpendicular to the direction of the rail; and

a rotation moving unit configured to rotate the holding unit around a vertical axis; wherein

each of the placement position information and the holding position information indicates positions in four directions including the direction of the rail, the lateral direction, the vertical direction, and the rotation direction around the vertical axis.

6. The transfer system according to claim 3, wherein

the transfer unit includes:

a holding unit configured to hold and release the article;

a vertical moving unit configured to move the holding unit in a vertical direction;

a lateral moving unit configured to move the holding unit in a lateral direction perpendicular to the direction of the rail; and

a rotation moving unit configured to rotate the holding unit around a vertical axis; wherein

each of the placement position information and the holding position information indicates positions in four directions including the direction of the rail, the lateral direction, the vertical direction, and the rotation direction around the vertical axis.

7. The transfer system according to claim 1, wherein the article includes a bottom surface formed with a concave portion,

the placement portion includes a top surface formed with a convex portion that can be engaged with the concave portion,

the article is placed on the predetermined position, where the article is positioned relative to the placement portion, by engagement between the concave portion and the convex portion.

8. The transfer system according to claim 2, wherein the article includes a bottom surface formed with a concave portion,

the placement portion includes a top surface formed with a convex portion that can be engaged with the concave portion,

the article is placed on the predetermined position, where the article is positioned relative to the placement portion, by engagement between the concave portion and the convex portion.

9. The transfer system according to claim 3, wherein the article includes a bottom surface formed with a concave portion,

the placement portion includes a top surface formed with a convex portion that can be engaged with the concave portion,

the article is placed on the predetermined position, where the article is positioned relative to the placement portion, by engagement between the concave portion and the convex portion.

10. The transfer system according to claim 4, wherein the article includes a bottom surface formed with a concave portion,

the placement portion includes a top surface formed with a convex portion that can be engaged with the concave portion,

the article is placed on the predetermined position, where the article is positioned relative to the placement portion, by engagement between the concave portion and the convex portion.

11. The transfer system according to claim 5, wherein the article includes a bottom surface formed with a concave portion,

the placement portion includes a top surface formed with a convex portion that can be engaged with the concave portion,

the article is placed on the predetermined position, where the article is positioned relative to the placement portion, by engagement between the concave portion and the convex portion.

12. The transfer system according to claim 6, wherein the article includes a bottom surface formed with a concave portion,

the placement portion includes a top surface formed with a convex portion that can be engaged with the concave portion,

the article is placed on the predetermined position, where the article is positioned relative to the placement portion, by engagement between the concave portion and the convex portion.

13. The transfer system according to claim 2, further comprising a teaching unit configured to teach the common data among a plurality of transport vehicles.

14. The transfer system according to claim 3, further comprising a teaching unit configured to teach the common data among a plurality of transport vehicles.

15. The transfer system according to claim 4, further comprising a teaching unit configured to teach the common data among a plurality of transport vehicles.

16. The transfer system according to claim 5, further comprising a teaching unit configured to teach the common data among a plurality of transport vehicles.

17. The transfer system according to claim 6, further comprising a teaching unit configured to teach the common data among a plurality of transport vehicles.

18. The transfer system according to claim 7, further comprising a teaching unit configured to teach the common data among a plurality of transport vehicles.

19. The transfer system according to claim 8, further comprising a teaching unit configured to teach the common data among a plurality of transport vehicles.

20. The transfer system according to claim 9, further comprising a teaching unit configured to teach the common data among a plurality of transport vehicles.

21. The transfer system according to claim 10, further comprising a teaching unit configured to teach the common data among a plurality of transport vehicles.

22. The transfer system according to claim 11, further comprising a teaching unit configured to teach the common data among a plurality of transport vehicles.

23. The transfer system according to claim 12, further comprising a teaching unit configured to teach the common data among a plurality of transport vehicles.

CLAIMS

1. A transfer system comprising:

a transport vehicle configured to move along a rail provided on a ceiling for moving an article; and

a placement portion disposed below the rail, having a predetermined position on which the article can be placed; wherein

the transport vehicle has a transfer unit configured to hold the article on the placement portion and to place the article onto the placement portion,

the transfer unit is configured to transfer the article between the transport vehicle and the placement portion,

the transfer system further comprising:

a memory configured to store (i) placement position information indicating a transfer position of the article when the transfer unit is to place the article onto the placement portion, and (ii) holding position information indicating a transfer position of the article when the transfer unit is to hold the article on the placement portion, the placement position information and the holding position information being independent information from each other; and

a controller configured to control the transfer unit such that, when the transfer unit is to place the article, the article is transferred at a transfer position indicated in the placement position information in the memory and, when the transfer unit is to hold the article, the article is transferred at a transfer position indicated in the holding position information in the memory;

the transfer unit includes:

a holding unit configured to hold and release the article;

a vertical moving unit configured to move the holding unit in a vertical direction;

a lateral moving unit configured to move the holding unit in a lateral direction perpendicular to the direction of the rail; and

the transfer vehicle being configured to move the article in a lateral direction and transfer the article between the transport vehicle and the placement portion, which is arranged in a lateral

direction of a main body of the transport vehicle.

2. The transfer system according to claim 1, wherein the article includes a bottom surface formed with a concave portion,

the placement portion includes a top surface formed with a convex portion that can be engaged with the concave portion,

the article is placed on the predetermined position, where the article is positioned relative to the placement portion, by engagement between the concave portion and the convex portion.

3. The transfer system according to claim 1, wherein

the transfer unit includes:

a rotation moving unit configured to rotate the holding unit around a vertical axis; wherein

each of the placement position information and the holding position information indicates positions in four directions including the direction of the rail, the lateral direction, the vertical direction, and the rotation direction around the vertical axis.

4. The transfer system according to claim 3, wherein the article includes a bottom surface formed with a concave portion,

the placement portion includes a top surface formed with a convex portion that can be engaged with the concave portion,

the article is placed on the predetermined position, where the article is positioned relative to the placement portion, by engagement between the concave portion and the convex portion.

5. The transfer system according to claim 1, wherein the placement position information and the holding position information are each indicated as sum of a common data indicating a transfer position common among a plurality of transport vehicles and a unique data indicating a transfer position unique to each transport vehicle.

6. The transfer system according to claim 5, wherein the article includes a bottom surface formed with a concave portion,

the placement portion includes a top surface formed with a convex portion that can be engaged with the concave portion,

the article is placed on the predetermined position, where the article is positioned relative to the placement portion, by engagement between the concave portion and the convex portion.

7. The transfer system according to claim 5, further comprising a teaching unit configured to teach the common data among a plurality of transport vehicles.

8. The transfer system according to claim 7, wherein the difference between the unique data of the placement position information and the unique data of the holding position information corresponds to an offset amount of the article calculated based on inclination degree of the article and a height of the article at the transfer position.

9. The transfer system according to claim 8, wherein each of the placement position information and the holding position information indicates positions in four directions including the direction of the rail, the lateral direction, the vertical direction, and the rotation direction around the vertical axis.

10. The transfer system according to claim 5, wherein

the transfer unit includes:

a rotation moving unit configured to rotate the holding unit around a vertical axis; wherein

each of the placement position information and the holding position information indicates positions in four directions including the direction of the rail, the lateral direction, the vertical direction, and the rotation direction around the vertical axis.

11. The transfer system according to claim 10, wherein the article includes a bottom surface formed with a concave portion,

the placement portion includes a top surface formed with a convex portion that can be engaged with the concave portion,

the article is placed on the predetermined position, where the article is positioned relative to the placement portion, by engagement between the concave portion and the convex portion.

12. The transfer system according to claim 10, wherein the article includes a bottom surface formed with a concave portion,

the placement portion includes a top surface formed with a convex portion that can be engaged with the concave portion,

the article is placed on the predetermined position, where the article is positioned relative to the placement portion, by engagement between the concave portion and the convex portion.

13. The transfer system according to claim 12, wherein the article includes a bottom surface formed with a concave portion,

the placement portion includes a top surface formed with a convex portion that can be engaged with the concave portion,

the article is placed on the predetermined position, where the article is positioned relative to the placement portion, by engagement between the concave portion and the convex portion.

14. The transfer system according to claim 5, wherein the difference between the unique data of the placement position information and the unique data of the holding position information corresponds to an offset amount of the article calculated based on inclination degree of the article and a height of the article at the transfer position.

15. The transfer system according to claim 14, wherein the article includes a bottom surface formed with a concave portion,

the placement portion includes a top surface formed with a convex portion that can be engaged with the concave portion,

the article is placed on the predetermined position, where the article is positioned relative to the placement portion, by engagement between the concave portion and the convex portion.

16. The transfer system according to claim 14, wherein

the transfer unit includes:

a rotation moving unit configured to rotate the holding unit around a vertical axis; wherein

each of the placement position information and the holding position information indicates positions in four directions including the direction of the rail, the lateral direction, the vertical direction, and the rotation direction around the vertical axis.

17. The transfer system according to claim 16, wherein the article includes a bottom surface formed with a concave portion,

the placement portion includes a top surface formed with a convex portion that can be engaged with the concave portion,

the article is placed on the predetermined position, where the article is positioned relative to the placement portion, by engagement between the concave portion and the convex portion.