CLAIMS

1. An article management system comprising:

an automated storage and retrieval system configured to store a plurality of containers, each container containing one or more articles, and take out, to a picking area adjacent to a pick-up area, a container containing at least one article to be picked up at the pick-up area, among the plurality of containers;

a control apparatus configured to control or support picking, at the picking area, the at least one article out of the container taken out by the automated storage and retrieval system;

a conveyor configured to transport, to the pick-up area, the at least one article picked by the picking; and

a storage configured to temporarily store the at least one article picked by the picking,

wherein the conveyor has a first lane configured to transport, to the pick-up area, the at least one article picked by the picking in a case in which the at least one article is not temporarily stored in the storage, and a second lane configured to transport, to the pick-up area, the at least one article picked by the picking in a case in which the at least one article is temporarily stored in the storage.

2. The article management system according to claim 1, further comprising a manipulator configured to perform the picking,

wherein the control apparatus is configured to control the picking by the manipulator.

3. The article management system according to claim 2, wherein the manipulator is configured to, before performing the picking, learn appearance of articles of a plurality of types, and when performing the picking, observe appearance of the one or more articles contained in the container taken out by the automated storage and retrieval system, and identify the at least one article according to learning and observation results.

4. The article management system according to any one of claims

1 to 3, wherein the automated storage and retrieval system is configured to store the plurality of containers separately in two or more compartments having temperature settings different from each other, according to types of articles contained in each container.

5. The article management system according to any one of claims 1 to 4, further comprising a database configured to hold inventory information for the automated storage and retrieval system,

wherein the control apparatus is configured to search the database to identify the container containing the at least one article, and cause the automated storage and retrieval system to take out the identified container to the picking area.

6. The article management system according to any one of claims 1 to 5, further comprising an input apparatus configured to accept an order operation for the at least one article by a user,

wherein the automated storage and retrieval system is configured to take out the container containing the at least one article to the picking area in response to the order operation accepted at the input apparatus.

7. The article management system according to claim 6, wherein

the automated storage and retrieval system comprises a rack configured to store the plurality of containers, and a crane configured to move along an aisle faced by the rack to retrieve the container containing the at least one article and take out the retrieved container to the picking area, and

the control apparatus is configured to predict an article to be ordered by the order operation before the order operation is completed, and cause the crane to move according to a storage position, in the rack, of a container containing the predicted article among the plurality of containers.

8. The article management system according to claim 6 or 7, further comprising an output apparatus configured to output, to the user, a list of types of articles contained in the plurality of containers,

wherein the input apparatus is configured to accept, as part of the order operation, an operation in which the user selects the at least one article

from the list outputted by the output apparatus.

9. The article management system according to any one of claims 1 to 5, wherein

the control apparatus is configured to receive order information for the at least one article transmitted through a network, and

the automated storage and retrieval system is configured to take out the container containing the at least one article to the picking area in response to the order information received at the control apparatus.

10. The article management system according to claim 9, further comprising:

an input apparatus configured to accept an input operation, by a user, of authentication information for picking up the at least one article; and

a storage configured to temporarily store the at least one article picked by the picking, and take out the at least one article to the pick-up area in response to the input operation accepted at the input apparatus.

11. The article management system according to any one of claims 1 to 5, further comprising an input apparatus configured to accept an input operation, by a user, of authentication information for picking up the at least one article,

wherein the automated storage and retrieval system is configured to take out the container containing the at least one article to the picking area in response to the input operation accepted at the input apparatus.

12. The article management system according to claim 11, further comprising a database configured to hold valid authentication information for each article contained in the plurality of containers,

wherein the control apparatus is configured to check the authentication information inputted by the input operation against the database to identify the container containing the at least one article, and cause the automated storage and retrieval system to take out the identified container to the picking area.

13. The article management system according to claim 11 or 12, configured to be installed in a courier's delivery location.

14. The article management system according to any one of claims 1 to 12, configured to be installed in a retailer's store.

15. The article management system according to any one of claims 1 to 12, configured to be installed in any one facility of a petrol station, a railway station, a compound, an office building, and an apartment building.

16. The article management system according to any one of claims 1 to 5, wherein the control apparatus is configured to execute a process for causing the automated storage and retrieval system to take out the container containing the at least one article to the picking area in response to each of an order operation for the at least one article by a user and order information for the at least one article transmitted through a network, and in a case in which while the order operation is carried out by one user, the order information from another user is transmitted, execute the process giving priority to the user carrying out the order operation.

17. The article management system according to any one of claims 1 to 5, wherein the automated storage and retrieval system comprises a plurality of vertically rotating racks configured to store the plurality of containers, each rack being configured to rotate independently.

18. The article management system according to any one of claims 1 to 5, further comprising a storage configured to temporarily store the at least one article picked by the picking,

wherein

the automated storage and retrieval system is configured to take out the container containing the at least one article to the picking area in response to order information for the at least one article transmitted through a network, and

the storage is configured to take out the at least one article to the pick-up area in response to an input operation, by a user, of authentication

information for picking up the at least one article.

19. The article management system according to claim 18, wherein the automated storage and retrieval system comprises a rack configured to store the plurality of containers, and the storage is installed closer to the pick-up area than the rack.

20. The article management system according to claim 18 or claim 19, wherein the automated storage and retrieval system comprises a conveyor configured to bring the container containing the at least one article to a position where the picking is to be performed, and at least part of the storage is installed above or below the conveyor.

21. The article management system according to any one of claims 18 to 20, wherein the storage is configured to store containers separately in two or more compartments having temperature settings different from each other, according to types of articles contained in each container.

22. The article management system according to claim 1, wherein the picking places, in another container, the at least one article picked out of the container taken out by the automated storage and retrieval system, the article management system further comprising another conveyor installed below or above the conveyor and configured to return, after the at least one article is picked up at the pick-up area, the container in which the at least one article has been placed by the picking, to the picking area.

23. The article management system according to claim 1 or claim 22, wherein the second lane is configured to be driven in an opposite direction from when transporting the at least one article to the pick-up area, to transport an article deposited by a user to the storage, and the storage is configured to store the article deposited by the user.

24. A logistics system comprising:

the article management system according to any one of claims 1 to 15; and

a mobile robot configured to deliver, to the article management system, an article brought into the automated storage and retrieval system.

25. A logistics system comprising:

the article management system according to any one of claims 1 to 15; and

a drone configured to deliver, to the article management system, an article brought into the automated storage and retrieval system.

26. A logistics system comprising:

a plurality of article management systems, each article management system being the article management system according to any one of claims 1 to 15; and

a management device configured to centrally monitor and control the plurality of article management systems.

27. A server device to be connected with an article management system including:

an automated storage and retrieval system configured to store a plurality of containers, each container containing one or more articles, and take out, to a picking area adjacent to a pick-up area, a container containing at least one article to be picked up at the pick-up area, among the plurality of containers; and

a control apparatus configured to control or support picking, at the picking area, the at least one article out of the container taken out by the automated storage and retrieval system,

the server device comprising:

a communication interface configured to communicate with a user's terminal device; and

a controller configured to accept a designation or a pre-order for the at least one article via the communication interface, select, from among a plurality of locations, a location where the container containing the at least one article is stored in the automated storage and retrieval system, with

reference to inventory information for the article management system, which is installed in each location of the plurality of locations, and inform the terminal device of the selected location via the communication interface.

28. The server device according to claim 27, wherein the controller is configured to detect a position of the user via the communication interface, and in a case in which the plurality of locations includes two or more locations where the container containing the at least one article is stored in the automated storage and retrieval system, select a location, of which the terminal device is to be informed, from among the two or more locations according to distances between the detected position and the two or more locations.

29. An article management method comprising:

by an automated storage and retrieval system configured to store a plurality of containers, each container containing one or more articles, taking out, to a picking area adjacent to a pick-up area, a container containing at least one article to be picked up at the pick-up area, among the plurality of containers;

by a control apparatus, controlling or supporting picking, at the picking area, the at least one article out of the container taken out by the automated storage and retrieval system;

by a first lane of a conveyor, transporting, to the pick-up area, the at least one article picked by the picking in a case in which the at least one article is not temporarily stored in a storage; and

by a second lane of the conveyor, transporting, to the pick-up area, the at least one article picked by the picking in a case in which the at least one article is temporarily stored in the storage.