CLAIMS

1. An article storage facility comprising:

an article storage shelf in which storage portions for storing articles are arranged in a vertical direction and a transverse width direction of the shelf;

a transport device that transports articles to the plurality of storage portions;

a transfer device that is provided in the transport device and that transfers articles to and from the storage portion, the transfer device being configured to be movable in a movement space, located in front of the article storage shelf, in the vertical direction and the transverse width direction of the shelf; and

an elevating scaffold capable of ascending/descending in the movement space across a withdrawal height that is set on an upper side from a movement range of the transfer device in the movement space in the vertical direction and a working height that is set in an intermediate location in the movement space in the vertical direction,

the article storage facility being characterized by comprising

a support body that supports the elevating scaffold located at the working height,

wherein a plurality of the working heights are set in the vertical direction,

a plurality of the support bodies are provided in the vertical direction so as to respectively correspond to the plurality of working heights, and

at least a support body other than a lowermost support body of the plurality of the support bodies is a movable support body that is configured to be movable to an acting position at which said support body protrudes toward the movement space so as to support the elevating scaffold and a withdrawal position at which said support body retracts toward the article storage shelf so as not to come into contact with the elevating scaffold moving up and down.

2. The article storage facility according to claim 1, characterized in that

the transport device comprises an elevator body that is movable in the movement space in the vertical direction and that supports the transfer device such that the transfer device is movable in the transverse width

direction of the shelf,

all of the plurality of the support bodies, including the lowermost support body, are the movable support bodies, and

the elevator body is located, in plan view, on the movement space side with respect to the movable support bodies at the withdrawal position, and is located at a position overlapping the movable support bodies at the acting position when viewed in the vertical direction.

3. The article storage facility according to claim 2, characterized by further comprising:

a control device that controls operation of the transport device;

a scaffold position detection device that detects a position of the elevating scaffold; and

a support body position detection device that detects a position of the movable support bodies,

wherein the control device is configured to regulate ascending/descending movement of the transfer device in a state in which the scaffold position detection device detects that the elevating scaffold is located below the withdrawal height, or in a state in which the support body position detection device detects that the movable support bodies are located on the acting position side with respect to the withdrawal position.

4. The article storage facility according to any one of claims 1 to 3, characterized in that

the movable support body is provided so as to be placed and supported on a component of the article storage shelf in a state in which the movable support body is located at the acting position.

5. The article storage facility according to any one of claims 1 to 4, characterized by further comprising:

an entry/exit scaffold that is provided at a position aligned with the movement space in the transverse width direction of the shelf, and at a height at which an operator can move to and from the elevating scaffold at the working height; and

a rotating shaft that is provided at a front end portion of the article storage shelf in a front-rear direction of the shelf and is rotatable about a

rotation axis along the transverse width direction of the shelf,

wherein the movable support body is configured to move to the acting position and the withdrawal position by swinging about a swing axis along the transverse width direction of the shelf in response to rotation of the rotating shaft, and

a manual operating member that can be operated by an operator at the entry/exit scaffold is provided so as to extend from the rotating shaft toward the entry/exit scaffold.

6. The article storage facility according to claim 5, characterized by further comprising:

an elevator body that is provided in the transport device, that is movable in the movement space in the vertical direction, and that supports the transfer device such that the transfer device is movable in the transverse width direction of the shelf;

a pair of guide bodies that guide the elevator body in the vertical direction in a state in which said guide bodies are located on both sides of the article storage shelf in the transverse width direction of the shelf; and

an operating member detection device that detects a state of mounting of the manual operating member,

wherein a length of the elevator body in the transverse width direction of the shelf is formed to be a length extending from the front of one of the guide bodies to the front of the other guide body,

both end portions of the elevator body in the transverse width direction of the shelf are provided with guided extension portions that are extended rearward of a front end of the article storage shelf in the front-rear direction of the shelf and are guided by the guide bodies,

the rotating shaft is provided in a state in which it is located between the two guided extension portions in the transverse width direction of the shelf,

the manual operating member is removably provided at one end portion of the rotating shaft, and is configured to have a length so as to extend from the rotating shaft to the entry/exit scaffold side with respect to the guided extension portions in a state in which the manual operating member is mounted to the rotating shaft, and

the control device is configured to regulate ascending/descending

movement of the elevator body in a state in which the operating member detection device detects that the manual operating member is mounted to the rotating shaft.

7. The article storage facility according to any one of claims 1 to 6, characterized in that

the elevating scaffold is configured to be suspended and supported by a wire that is let out from a manually operated take-up roller and to move up and down with rotation operation of the take-up roller,

a regulating device is provided that regulates rotation of the take-up roller when the elevating scaffold has moved down to the working height, and

the regulating device comprises a movable body that moves as a result of rotation operation of the take-up roller and a regulating body that regulates rotation of the take-up roller by coming into contact with the movable body when the elevating scaffold has moved down to the working height, and the height at which rotation of the take-up roller is regulated can be selected from the plurality of working heights by changing the position at which the movable body comes into contact with the regulating body.

8. The article storage facility according to claim 7, characterized in that

a first working height and a second working height that is lower than the first working height are set as the working heights,

the regulating device is configured to be switchable between a first regulating state in which it regulates movement of the movable body by coming into contact with the movable body when the elevating scaffold has descended to the first working height and a second regulating state in which it regulates movement of the movable body by coming into contact with the movable body when the elevating scaffold has descended to the second working height, and

a movement regulating member that is movable to a regulating position at which it regulates movement of the movable support body provided corresponding to the first working height and an allowable position at which it allows movement of the movable support body provided corresponding to the first working height, and

a linking device that links the regulating device and the movement

regulating member so as to move the movement regulating member to the regulating position as a result of the regulating device switched to the second regulating state, and to move the movement regulating member to the allowable position as a result of the regulating device switched to the first regulating state are provided.

9. The article storage facility according to any one of claims 1 to 8, characterized in that

the support bodies are provided on both a first side and a second side across the movement space in the front-rear direction of the shelf, and

an interlocking device is provided that interlocks the support bodies on the first side and the support bodies on the second side of the movable support bodies so as to move the support bodies on the second side to the acting position by moving the support bodies on the first side to the acting position, and move the support bodies on the second side to the withdrawal position by moving the support bodies on the first side to the withdrawal position.

CLAIMS

[Claim 1]

An article storage facility comprising:

an article storage shelf in which storage portions for storing articles are arranged in a vertical direction and a transverse width direction of the shelf;

a transport device that transports articles to the plurality of storage portions;

a transfer device that is provided in the transport device and that transfers articles to and from the storage portion, the transfer device being configured to be movable in a movement space, located in front of the article storage shelf, in the vertical direction and the transverse width direction of the shelf; and

an elevating scaffold capable of ascending/descending in the movement space across a withdrawal height that is set on an upper side from a movement range of the transfer device in the movement space in the vertical direction and a working height that is set in an intermediate location in the movement space in the vertical direction,

the article storage facility being characterized by comprising a support body that supports the elevating scaffold located at the working height, wherein a plurality of the working heights are set in the vertical direction, and a plurality of the support bodies are provided in the vertical direction so as to respectively correspond to the plurality of working heights,

each of all of the plurality of the support bodies, including the lowermost support body, is configured to be movable to an acting position at which said support body protrudes toward the movement space so as to support the elevating scaffold and a withdrawal position at which said support body retracts toward the article storage shelf so as not to come into contact with the elevating scaffold moving up and down,

the transport device comprises an elevator body that is movable in the movement space in the vertical direction and that supports the transfer device such that the transfer device is movable in the transverse width direction of the shelf, and

the elevator body is located, in plan view, on the movement space side with respect to the support bodies at the withdrawal position, and is located at a position overlapping the support bodies at the acting position when viewed in the vertical direction.

[Claim 2]

The article storage facility according to claim 1, characterized by further comprising:

a control means that controls operation of the transport device;

a scaffold position detection means that detects a position of the elevating

scaffold; and

a support body position detection means that detects a position of the support bodies,

wherein the control means is configured to regulate ascending/descending movement of the transfer device in a state in which the scaffold position detection means detects that the elevating scaffold is located below the withdrawal height, or in a state in which the support body position detection means detects that the support bodies are located on the acting position side with respect to the withdrawal position.

[Claim 3]

The article storage facility according to any one of claims 1 to 2, characterized in that

the movable support body is provided so as to be placed and supported on a component of the article storage shelf in a state in which the movable support body is located at the acting position.

[Claim 4]

The article storage facility according to any one of claims 1 to 3, characterized by further comprising:

an entry/exit scaffold that is provided at a position aligned with the movement space in the transverse width direction of the shelf, and at a height at which an operator can move to and from the elevating scaffold at the working height; and

a rotating shaft that is provided at a front end portion of the article storage shelf in a front-rear direction of the shelf and is rotatable about a rotation axis along the transverse width direction of the shelf,

wherein the movable support body is configured to move to the acting position and the withdrawal position by swinging about a swing axis along the transverse width direction of the shelf in response to rotation of the rotating shaft, and

a manual operating member that can be operated by an operator at the entry/exit scaffold is provided so as to extend from the rotating shaft toward the entry/exit scaffold.

[Claim 5]

The article storage facility according to claim 4, characterized by further comprising:

an elevator body that is provided in the transport device, that is movable in the movement space in the vertical direction, and that supports the transfer device such that the transfer device is movable in the transverse width direction of the shelf;

a pair of guide bodies that guide the elevator body in the vertical direction in a state in which said guide bodies are located on both sides of the article storage shelf in the transverse width direction of the shelf; and

wherein a length of the elevator body in the transverse width direction of the shelf is formed to be a length extending from the front of one of the guide bodies to the front of the other guide body,

both end portions of the elevator body in the transverse width direction of the shelf are provided with guided extension portions that are extended rearward of a front end of the article storage shelf in the front-rear direction of the shelf and are guided by the guide bodies,

the rotating shaft is provided in a state in which it is located between the two guided extension portions in the transverse width direction of the shelf,

the manual operating member is removably provided at one end portion of the rotating shaft, and is configured to have a length so as to extend from the rotating shaft to the entry/exit scaffold side with respect to the guided extension portions in a state in which the manual operating member is mounted to the rotating shaft, and

an operating member detection means that detects a state of mounting of the manual operating member,

the control means that controls operation of the transport device is configured to regulate ascending/descending movement of the elevator body in a state in which the operating member detection means detects that the manual operating member is mounted to the rotating shaft.

[Claim 6]

The article storage facility according to any one of claims 1 to 5, characterized in that

the elevating scaffold is configured to be suspended and supported by a wire that is let out from a manually operated take-up roller and to move up and down with forward/backward rotation operation of the take-up roller,

a regulating means is provided that regulates rotation of the take-up roller when the elevating scaffold has moved down to the working height, and

the regulating means comprises a movable body that moves as a result of rotation operation of the take-up roller and a regulating body that regulates rotation of the take-up roller by coming into contact with the movable body when the elevating scaffold has moved down to the working height, and the working height at which rotation of the take-up roller is regulated can be selected from the plurality of working heights by changing the position at which the movable body comes into contact with the regulating body.

[Claim 7]

The article storage facility according to claim 6, characterized in that

a first working height and a second working height that is lower than the first working height are set as the working heights,

the regulating means is configured to be switchable between a first regulating state in which it regulates movement of the movable body by coming into contact with the movable body when the elevating scaffold has descended to the first working height and a second regulating state in which it regulates movement of the movable body by coming into contact with the movable body when the elevating scaffold has descended to the second working height, and

a movement regulating member that is movable to a regulating position at which it regulates movement of the support body provided corresponding to the first working height and an allowable position at which it allows movement of the support body provided corresponding to the first working height, and

a linking means that links the regulating means and the movement regulating member so as to move the movement regulating member to the regulating position as a result of the regulating means switched to the second regulating state, and to move the movement regulating member to the allowable position as a result of the regulating means switched to the first regulating state are provided.

[Claim 8]

The article storage facility according to any one of claims 1 to 7, characterized in that

the support bodies are provided on both a first side and a second side across the movement space in the front-rear direction of the shelf, and

an interlocking means is provided that interlocks the support bodies on the first side and the support bodies on the second side of the movable support bodies so as to move the support bodies on the second side to the acting position by moving the support bodies on the first side to the acting position, and move the support bodies on the second side to the withdrawal position by moving the support bodies on the first side to the withdrawal position.