[CLAIMS]

[Claim 1]

An apparatus for automatic transport of chemical containers, the apparatus comprising:

a lifting/lowering unit configured to lift a chemical container (2) from a first height to a second height; and

a controller configured to control driving of the lifting/lowering unit to transport the chemical container (2), which is lifted to the second height, to a chemical supply device (5);

further comprising an input unit (110) configured to transport the chemical container (2) to the lifting/lowering unit in a state in which the chemical container (2) is loaded on the transport member at a height identical to the first height of the lifting/lowering unit, the input unit (110) includes a plurality of transport members on which the chemical container (2) is loaded and a transport member driving unit configured to drive the transport members;

the transport members are provided as a plurality of transport members (111a, 111b, 111c) that are spaced apart in a direction perpendicular to a direction in which the chemical container (2) is transported; and

wheel rail units (112a, 112b) are provided between the plurality of transport members (111a, 111b, 111c) at a position higher than the bottom (12) of the input unit (110) to allow wheels of a forklift with fork (4a), which is configured to load the chemical container (2) on the input unit (110), to enter; the wheel rail units (112a, 112b) are provided so that upper surfaces thereof are disposed at a position lower than that of upper ends of the transport members (111a, 111b, 111c);

the pallet (3) on which the chemical container (2) is loaded is mounted on an upper portion of a transport member provided on the input unit (110);

when the second sensor (114-2) senses the pallet (3) seated on the upper portion of the transport members (111a, 111b, 111c), a first stopper (113-1), which is provided adjacent to the inlet of the input unit, protrudes to the central portion of the input unit to a position at which a rear end of the pallet (3) is able to be caught at the first stopper (113-1) and the pallet (3) seated on the upper portions of the transport members (111a, 111b, 111c) is prevented from being transferred in the direction of the entrance of the input unit (110).

[Claim 2]

The apparatus of claim 1, wherein the lifting/lowering unit includes a transport member (121) on which the chemical container (2) is loaded, a transport member driving unit configured to drive the transport member (121) to transport the chemical container (2), and a lifting/lowering driving unit configured to lift the transport member (121), on which the chemical container (2) is loaded, from the first height to the second height and then, when the chemical container (2) moves out from the lifting/lowering unit, lower the transport member (121).

[Claim 3]

The apparatus of claim 1, wherein an alignment unit configured to align a pallet (3), on which the chemical container (2) is loaded, to a central portion is provided on the input unit (110).

[Claim 4]

The apparatus of claim 1, wherein an alignment unit configured to align the pallet (3), on which the chemical container (2) is loaded, to a central portion is provided on the lifting/lowering unit.

[Claim 5]

The apparatus of claim 3 or 4, wherein the alignment unit includes:

a pair of alignment members configured to push both side surfaces of the pallet (3) to align the pallet (3) to be parallel to a direction in which the chemical container (2) is transported; and

an alignment driving unit configured to reciprocate the pair of alignment members in directions facing each other.

[Claim 6]

The apparatus of claim 5, wherein the alignment member has a length in the direction in which the chemical container (2) is transported and has at least a portion that comes in surface contact with a side surface of the pallet (3).

[Claim 7]

The apparatus of claim 3 or 4, wherein the input unit (110) or the lifting/lowering unit includes:

a transport member on which the chemical container (2) is loaded; and

a transport member driving unit configured to drive the transport member so that the chemical container (2) is transported,

wherein the transport member that comes in contact with a bottom surface of the pallet (3) is made of a metal material.

[Claim 8]

The apparatus of claim 1, wherein a second stopper (113-2) is provided to, when the pallet (3) having the chemical container (2) loaded thereon is mounted on the upper portion of the transport member provided on the input unit (110), prevent the chemical container (2) and the pallet (3) from deviating from a set position in a direction toward the lifting/lowering unit is located.

[Claim 9]

The apparatus of claim 1, wherein:

a first sensor (114-1) is provided adjacent to an inlet of the input unit (110) to, when the pallet (3) having the chemical container (2) loaded thereon enters, sense a front end of the pallet (3); and

when the first sensor (114-1) senses the pallet (3), the controller operates the second stopper (113-2) to prevent the pallet (3) having the chemical container (2) loaded thereon from deviating from a set position in a direction toward the lifting/lowering unit.

[Claim 10]

The apparatus of claim 1, wherein:

a second sensor (114-2) is provided adjacent to an outlet of the input unit (110) to, when the pallet (3) having the chemical container (2) loaded thereon enters and is transported a predetermined distance, sense the front end of the pallet (3); and

when the second sensor (114-2) senses the pallet (3), the controller generates an alarm.

[Claim 11]

The apparatus of claim 1, wherein:

a first sensor (114-1) is provided on the input unit (110) to, when the pallet (3) having the chemical container (2) loaded thereon is input, sense the front end of the pallet (3); and

when the first sensor (114-1) attempts to sense the front end of the pallet (3) and then determines that an object to be sensed is not present, the controller controls a shutter (20) provided behind the input unit (110) to be closed.

[Claim 12]

The apparatus of claim 1, wherein:

an inspection unit (130) is provided to inspect chemical information of the transported chemical container (2) that is lifted to the second height by the lifting/lowering unit; and

the controller receives the chemical information from the inspection unit (130) and, when the received chemical information matches information required by the chemical supply device (5), controls the chemical container (2) to be supplied to the chemical supply device (5).

[Claim 13]

The apparatus of claim 1, wherein at least one transport line is provided to transport the chemical container (2), which is transported from the lifting/lowering unit, to the chemical supply device (5).

[Claim 14]

The apparatus of claim 1, wherein the lifting/lowering unit includes:

a first lifting/lowering unit configured to lift the chemical container (2) from the first height to the second height to input the chemical container (2) to be transported to the chemical supply device (5); and

a second lifting/lowering unit configured to lower and discharge the chemical container (2) transported from the chemical supply device (5).

[Claim 15]

The apparatus of claim 14, wherein:

the second lifting/lowering unit is provided on a side portion of the first lifting/lowering unit; and

the lifting/lowering unit includes a first transport line (100) connected to the first lifting/lowering unit and a second transport line (200) disposed to be parallel and

adjacent to the first transport line (100) and connected to the second lifting/lowering unit.

[Claim 16]

The apparatus of claim 14, wherein:

a discharge unit that includes a transport member and a transport member driving unit configured to drive the transport member is provided to discharge a used chemical container (2) from the chemical supply device (5); and

the chemical container (2) is lowered by the second lifting/lowering unit and then discharged via the discharge unit.