Claims:

1. A container fitting removing and installing system for a container, comprising:

a control unit;

an identifying unit connected to the control unit and configured to identify a type and position information of the container and a types and position information of container fittings and transmit an identification result to the control unit;

a removing and installing unit connected to the control unit which controls the removing and installing unit to remove the container fittings from the container or to install the container fittings onto the container according to the received identification result;

a tray configured to carry the container fittings, the tray including a tray rack and a plurality of carrying portions, the tray rack having a plurality of installing holes, wherein the carrying portions are provided in the installing holes of the tray rack; and

a tilting mechanism, the tilting mechanism being configured to drive the tray to tilt to separate the container fittings from the tray.

2. The container fitting removing and installing system for the container according to claim 1, wherein each of the carrying portions comprises two oppositely provided cover plates, and top ends of the opposite sides of the two cover plates are respectively hinged to top ends of the opposite side walls of the installing hole; when the cover plates are in a closed state, an accommodation space for carrying the container fittings is formed between the opposite sides of the two cover plates; a bottom end of a side wall of the installing hole has a protrusion extending towards an axis of the installing hole, and the protrusion is configured to restrict the cover plate from opening in one direction; when the tray rack is tilted by 180°, the cover plates are automatically opened to make the container fittings automatically fall into gearbins.

3. The container fitting removing and installing system for the container according to claim 1, wherein the tilting mechanism comprises a tilting motor and a supporting frame connected to an output end of the tilting motor, and the supporting frame is configured to carry the tray, and the tilting motor is connected to the control unit.

4. The container fitting removing and installing system for the container according to claim 3, wherein the supporting frame comprises a first supporting frame and a second supporting frame provided at intervals on both sides of the tilting motor; and the tilting mechanism further comprises:

a first gear sleeved on the output end of the tilting motor which drives the first gear to rotate synchronously;

a second gear meshed to the first gear;

a first sprocket connected to the second gear through a first chain;

a first rotating shaft provided in the first supporting frame, the first rotating shaft being connected to the first sprocket to drive the first supporting frame to tilt under the driving of the first sprocket;

a second sprocket connected to the second gear through a second chain; and

a second rotating shaft provided in the second supporting frame, the second rotating shaft being connected to the second sprocket to drive the second supporting frame to tilt under the driving of the second sprocket.

5. The container fitting removing and installing system for the container according to claim 1, further comprising a slewing mechanism which comprises:

a slewing motor connected to the control unit;

a third gear connected to an output end of the slewing motor;

a fourth gear respectively connected to the third gear and the tilting mechanism; the tilting mechanism being provided above the fourth gear;

the slewing motor is configured to drive the third gear and the fourth gear to operate under the control of the control unit, so as to drive the tilting mechanism to rotate in a horizontal plane.

6. The container fitting removing and installing system for the container according to claim 5, further comprising:

a lifting and lowering mechanism connected to the slewing mechanism and configured to drive the slewing mechanism and the tilting mechanism which is connected to the slewing mechanism to move in a vertical direction.

7. The container fitting removing and installing system for the container according to claim 1, further comprising:

a conveying unit configured to convey the tray between the removing and installing unit and the tilting mechanism.

8. The container fitting removing and installing system for the container according to claim 7, wherein the conveying unit comprises a plurality of conveying mechanisms and jacking

mechanisms, each jacking mechanism is provided between two adjacent conveying mechanisms and provided close to the removing and installing unit, and the jacking mechanism comprises:

an outer frame fixed with a fifth sprocket at an upper end thereof;

a jacking motor provided at the bottom of the outer frame, an output end of the jacking motor being connected to a sixth sprocket, the fifth sprocket and the sixth sprocket being connected by a third chain; and

a support rack configured to place the tray, the support rack being connected to the third chain and moving in a vertical direction by operation of the third chain when the jacking motor drives the sixth sprocket to drive the third chain to operate.

9. The container fitting removing and installing system for the container according to claim 8, wherein an upper end of the outer frame is further provided with a guide rod extending in a vertical direction, the guide rod passes through a support frame, and the support frame is capable of moving up and down along the guide rod.

10. The container fitting removing and installing system for the container according to claim 7, further comprising a palletizing unit which comprises:

a palletizing rack configured to stack the tray; and

a palletizing robot connected to the control unit and configured to achieve the transfer of the tray between the conveying unit and the palletizing rack, the palletizing robot comprising a palletizing robotic arm connected to the control unit and a palletizing spreader installed at one end of the palletizing robotic arm.

11. The container fitting removing and installing system for the container according to claim 1, wherein the tray rack is provided with a plurality of lifting points and provided with a mortise and a tenon matched with each other, wherein the lifting points and the mortise are provided on an upper surface of the tray rack, and the tenon is provided on a lower surface of the tray rack.

12. The container fitting removing and installing system for the container according to claim 1, wherein the identifying unit comprises:

a container identifying unit connected to the control unit and configured to identify the type and position information of the container and send an identification result to the control unit; and

a container fitting identifying unit connected to the control unit, the control unit being further configured to control the container fitting identifying unit to move to a suitable position according to the identification result of the container identifying unit, so that the container fitting identifying

unit obtains the types and position information of the container fittings; the container fitting identifying unit being configured to transmit the identified types and position information of the container fittings to the control unit.

13. The container fitting removing and installing system for the container according to claim 12, wherein the container identifying unit comprises five sensors arranged on a pedestal bracket at intervals along a first direction, and the pedestal bracket is configured to carry the container; and wherein each sensor is connected to the control unit, and when the sensor detects an object, the sensor sends a signal to the control unit, and the control unit determines the type and position information of the container according to the signal output by each sensor.

14. The container fitting removing and installing system for the container according to claim 12, wherein the container fitting identifying unit stores template comparing images of multiple types of container fittings, and a method that the container fitting identifying unit obtains the types and position information of the container fittings comprises steps of:

laser scanning the container fittings to obtain images of preset surfaces of the container fittings;

analyzing each point in the images to obtain depth information corresponding to each point;

respectively comparing the depth information of each point on the obtained images with depth information of each corresponding point in each template comparing image to determine the types of the container fittings; and

comparing the template comparing images corresponding to the container fittings with the obtained images of the container fittings to obtain the position information of the container fittings.

15. The container fitting removing and installing system for the container according to claim 12, wherein a sun visor is provided near the container fitting identifying unit.

16. The container fitting removing and installing system for the container according to claim 1, wherein the removing and installing unit comprises a plurality of robotic arms and a floating device connected to the robotic arm, the floating device is installed with a gripper for gripping the container fittings, each robotic arm is equipped with an automatic quick gripper replacement device, and a gripper cabinet configured to accommodate different types of grippers is provided near each robotic arm.

17. An operation method for the container fitting removing and installing system for the container according to claim 10, comprising steps of:

the control unit receiving an operation command;

the control unit controlling the palletizing unit to operate according to the operation command to make the palletizing unit place a tray full of container fittings either at a designated area or at the tilting mechanism;

when the palletizing unit transports the tray full of the container fittings to the tilting mechanism, the control unit controlling the tilting mechanism to tilt the tray with container fittings by 180°, to make the container fittings automatically fall into the gearbins under the action of gravity;

the control unit controlling the palletizing unit to place the transported empty tray at a designated position;

repeating the above two steps until removing of the container fittings is completed.

18. The operation method according to claim 17, wherein the operation command comprises the quantity of container fittings to be removed and the quantity of container fittings to be installed; the control unit controlling the palletizing unit to operate according to the operation command to make the palletizing unit place a tray full of container fittings either at a designated area or at the tilting mechanism comprises steps of:

the control unit comparing the quantity of container fittings to be removed with the quantity of container fittings to be installed based on the operation command, and if the quantity of container fittings to be removed is equal to the quantity of container fittings to be installed, the control unit controlling the palletizing unit to place the tray in the designated area;

if the quantity of container fittings to be removed is more than the quantity of container fittings to be installed, the control unit controlling the palletizing unit to place the tray full of the same quantity of container fittings as the quantity of container fittings to be installed into the designated area, and to place the remaining trays into the tilting mechanism; and

if the quantity of container fittings to be removed is less than the quantity of container fittings to be installed, the control unit controlling the palletizing unit to place the trays into the designated area and manually place on empty trays a quantity of container fittings equal to the difference between the quantity of container fittings to be installed and the quantity of container fittings to be removed.