Claims

1. A conveying device (100), comprising:

a first support frame (1);

a first conveying mechanism (2) and a second conveying mechanism (3) which are installed on the first support frame; and

a switching mechanism (4) configured to selectively lift the first conveying mechanism or the second conveying mechanism in a vertical direction, such that the first conveying mechanism or the second conveying mechanism carries goods (401) and conveys the goods in a first horizontal direction (F1) or a second horizontal direction (F2) different from the first horizontal direction,

wherein the first conveying mechanism comprises: a second support frame (21) installed on the first support frame; a first rolling mechanism (22) installed on the second support frame and suitable for carrying the goods under a drive of the switching mechanism; and a second driving mechanism (23) suitable for driving the first rolling mechanism to rotate relative to the second support frame, such that the first rolling mechanism pushes the goods to move in the first horizontal direction,

wherein the second conveying mechanism comprises: a third support frame (31) installed on the first support frame; a second rolling mechanism (32) installed on the third support frame and suitable for carrying the goods under the drive of the switching mechanism; and a third driving mechanism (33) suitable for driving the second rolling mechanism to rotate relative to the third support frame, such that the second rolling mechanism pushes the goods to move in the second horizontal direction,

wherein the switching mechanism comprises: a plurality of first lifting mechanisms (41) suitable for lifting the second support frame; a plurality of second lifting mechanisms (42) suitable for lifting the third support frame; and a fourth driving mechanism (43) configured to selectively drive the plurality of first lifting mechanisms to lift the second support frame, or drive

the plurality of second lifting mechanisms to lift the third support frame.

2. The conveying device according to claim 1, further comprising: a fixation base (5), wherein the first support frame is rotatably installed on the fixation base.

3. The conveying device according to claim 1 or 2, wherein the first conveying mechanism or the second conveying mechanism carries and conveys the goods on a substantially same horizontal support surface.

4. The conveying device according to any one of claims 1 to 3, wherein the first horizontal direction is substantially perpendicular to the second horizontal direction.

5. The conveying device according to any one of claims 2 to 4, wherein the first support frame comprises:

an annular frame (11);

a first base (12,13) installed at a lower portion of the annular frame; and

a rotating ring (14) arranged on the first base and located at a center of the annular frame, and

wherein the fixation base comprises:

a second base (51) fixedly installed relative to the ground; and

a first pivot (52) fixed on the second base, wherein the rotating ring is rotatably installed on the first pivot.

6. The conveying device according to claim 5, further comprising: a first driving mechanism (6) configured to drive the rotating ring to rotate relative to the fixation base.

7. The conveying device according to claim 6, wherein the first driving mechanism

comprises:

a first support seat (61) fixedly installed relative to the ground;

a first motor (62) installed on the first support seat; and

a first driving wheel (63) installed on a driving shaft of the first motor, wherein the first driving wheel (63) is in rotatable contact with the annular frame so as to drive the rotating ring to rotate.

8. The conveying device according to any one of claims 5 to 7, further comprising: a plurality of balance mechanisms (7) fixedly installed relative to the ground and rotatably supported at the lower portion of the annular frame at a predetermined interval, so as to keep a transverse frame substantially parallel to a horizontal plane.

9. The conveying device according to claim 8, wherein each of the plurality of balance mechanisms comprises:

a second support seat (71) fixedly installed relative to the ground; and

at least one first rolling wheel (72) installed on the second support seat, wherein the at least one first rolling wheel rotatably supports the annular frame.

10. The conveying device according to claim 1, wherein the fourth driving mechanism comprises:

a second motor (431); and

two first driving shafts (434) configured to rotate synchronously under a drive of the second motor,

wherein the first lifting mechanism comprises first cams (41) installed on the two first driving shafts, and the second lifting mechanism comprises second cams (42) installed on the two first driving shafts, and

wherein the first cam and the second cam are suitable for respectively lifting the

second support frame and the third support frame under a drive of the first driving shaft.

11. The conveying device according to claim 10, wherein the first cam and the second cam are configured such that:

within a first angle range of a rotation of the first driving shaft, the first rolling mechanism carries and conveys the goods within the horizontal support surface, a maximum height of the second rolling mechanism is not higher than the horizontal support surface, and the second rolling mechanism leaves the goods during the first rolling mechanism conveying the goods;

within a second angle range of the rotation of the first driving shaft, the second rolling mechanism carries and conveys the goods within the horizontal support surface; a maximum height of the first rolling mechanism is not higher than the horizontal support surface, and the first rolling mechanism leaves the goods during the second rolling mechanism conveying of the goods, and

when the rotation of the first driving shaft is transiting between the first angle range and the second angle range, the first rolling mechanism and the second rolling mechanism jointly support the goods within the horizontal support surface.

12. The conveying device according to claim 11, wherein during the rotation of the first driving shaft from 0 degree to 360 degrees, the first angle range is 0 degree to 180 degrees, and the second angle range is 180 degrees to 360 degrees.

13. The conveying device according to claim 12, wherein each of the first cam and the second cam comprises a first part (411) and a second part (412), and

wherein in a cross section along a radial direction, a support surface of the first part is a semicircular arc, a support surface of the second part is an elliptical arc along a major axis of an ellipse, and the semicircular arc of the first part is smoothly connected to the elliptical arc of

the second part.

14. The conveying device according to any one of claims 10 to 13, wherein the fourth driving mechanism further comprises:

a first transmission mechanism (433), wherein the second motor drives the two first driving shafts to rotate through the first transmission mechanism; and

a plurality of third support seats (435) installed on the first support frame, wherein the two first driving shafts are rotatably supported on the third support seats.

15. The conveying device according to claim 14, wherein the first transmission mechanism comprises two first conveyor belts, and the second motor respectively drives the two first driving shafts to rotate through the first conveyor belts.

16. The conveying device according to any one of claims 10 to 15, wherein

the second support frame comprises:

two first longitudinal frames (211) arranged opposite to each other, and

two first transverse frames (212) arranged between the first longitudinal frames; and

wherein the first rolling mechanism comprises:

a plurality of pairs of fourth support seats (221), wherein each pair of fourth support seats are installed opposite to each other on the two first longitudinal frames; and

a plurality of rollers (222) arranged parallel to each other, wherein two ends of each of the plurality of rollers are rotatably installed on a pair of fourth support seats so as to drive the goods to move in the first horizontal direction.

17. The conveying device according to claim 16, wherein the second driving mechanism comprises:

a fifth support seat (231) installed on the second support frame;

a third motor (232) installed on the fifth support seat; and

a second transmission mechanism (233), wherein the third motor drives the roller to rotate through the second transmission mechanism.

18. The conveying device according to claim 17, wherein the second transmission mechanism comprises:

a second conveyor belt (233), wherein the third motor drives a driving roller (2221) in the plurality of rollers to rotate through the second conveyor belt; and

a plurality of third conveyor belts (234), wherein the driving roller sequentially drives each driven roller in the plurality of rolling drums to rotate through the plurality of third conveyor belts.

19. The conveying device according to any one of claims 16 to 18, further comprising: a plurality of first auxiliary roller (81) arranged on the first support frame outside the first transverse frame, wherein each of the plurality of first auxiliary rollers is arranged parallel to the roller.

20. The conveying device according to claim 19, wherein the first auxiliary roller rotates under a drive of the goods during the first conveying mechanism conveying the goods.

21. The conveying device according to any one of claims 16 to 20, wherein

the third support frame comprises:

two second longitudinal frames (311) arranged opposite to each other; and

a plurality of second transverse frames (312), wherein two ends of each of the plurality of second transverse frames are installed between the second longitudinal frames and located between two adjacent rollers; and

wherein the second rolling mechanism comprises:

a plurality of rows of sixth support seats (321), wherein each row of sixth support seats are installed on a second transverse frame; and

a plurality of rows of rolling wheels (322) rotatably installed on the plurality of rows of sixth support seats, respectively, wherein a rotation shaft of each rolling wheel extends perpendicular to the second horizontal direction so as to drive the goods to move in the second horizontal direction.

22. The conveying device according to claim 21, wherein the third driving mechanism comprises:

a seventh support seat (331) installed on the third support frame;

a fourth motor (332) installed on the seventh support seat; and

a third transmission mechanism (333), wherein the fourth motor drives each rolling wheel to rotate through the third transmission mechanism.

23. The conveying device according to claim 22, wherein the third transmission mechanism comprises:

a plurality of eighth support seats (3331) installed at a lower portion of the second transverse frame;

a second driving shaft (3332) rotatably installed on the eighth support seat, wherein the second driving shaft extends in a direction perpendicular to the second horizontal direction;

a fourth conveyor belt (3333), wherein the fourth motor drives the second driving shaft to rotate through the fourth conveyor belt;

a fifth conveyor belt (3334), wherein the second driving shaft drives a first rolling wheel (3221) in each row of rolling wheels to rotate through the fifth conveyor belt; and

a plurality of sixth conveyor belts (3335), wherein the first rolling wheel sequentially drives each second rolling wheel (3222) in each row of rolling wheels to rotate through the plurality of sixth conveyor belts.

24. The conveying device according to any one of claims 21 to 23, wherein the second rolling mechanism further comprises: a plurality of rows of auxiliary rolling wheels (323), wherein each row of auxiliary rolling wheels are rotatably installed on the sixth support seat between two adjacent rows of rolling wheels.

25. The conveying device according to any one of claims 21 to 23, further comprising: a plurality of second auxiliary rollers (82) arranged on the first support frame outside the first longitudinal frame, wherein each of the plurality of second auxiliary rollers is arranged parallel to an axis of the rolling wheel.

26. The conveying device according to claim 25, wherein the second auxiliary roller rotates under a drive of the goods during the second conveying mechanism conveying the goods.

27. The conveying device according to any one of claims 10 to 26, further comprising: a guide mechanism (9) suitable for guiding the second support frame and the third support frame to move in the vertical direction.

28. The conveying device according to claim 27, wherein the guide mechanism comprises:

a plurality of guide columns (91) installed on the first support frame in the vertical direction;

a plurality of first guide blocks (92) installed on the second support frame, wherein each of the plurality of first guide blocks is provided with a guide hole (821) matched with the guide column; and

a plurality of second guide blocks (93) installed on the third support frame, wherein each of the plurality of second guide blocks is provided with a guide hole (931) matched with the guide column.

29. The conveying device according to claim 28, wherein one first guide block and one second guide block share one guide column, there is a gap between the first guide block and the second guide block in the vertical direction, and the gap is not less than a maximum height of a movement of the first conveying mechanism or the second conveying mechanism in the vertical direction.

30. The conveying device according to any one of claims 1 to 29, further comprising: a sensor suitable for detecting that the conveying device is provided with the goods, the goods are being loaded onto the conveying device and the goods are being unloaded from the conveying device.

31. An inspection system (1000), comprising:

an inspection channel (200);

one or two conveying devices according to any one of claims 1 to 30, wherein the conveying device is installed outside at least one of an entrance and an exit of the inspection channel so as to convey the goods into the inspection channel and/or receive the goods output from the inspection channel; and

an inspection device (300) configured to inspect the goods conveyed by the conveying device.