widths corresponding to a plurality of types of widths of the carrier tape, wherein the fixing device includes:

a fixed stage that is provided immovably to a base;

a movable stage that is arranged at a position overlapping with the fixed stage, and is moved together with the side guides;

a plurality of first locking holes that are formed on the fixed stage at positions with different distance from a center line of a running path;

a plurality of second locking holes that are formed on the movable stage with the same number to the first locking holes on a straight line parallel to the running path; and

a fastener that is selectively inserted into any one of a pair of the first locking holes and the second locking holes to fix the side guides.

In addition, according an embodiment of the present disclosure, a carrier tape running apparatus that runs a carrier tape in a longitudinal direction of the carrier tape, the carrier tape having pockets that are arrayed in the longitudinal direction to hold electronic components, the carrier tape running apparatus including:

a pair of side guides that are arranged on both sides sandwiching the carrier tape so as to form a running path in the longitudinal direction, and are moved in directions of coming close to and apart from lateral edges of the carrier tape; and

a fixing device that fixes, in a stepwise manner, the pair of side guides at positions where the transport path has widths corresponding to a plurality of types of widths of the carrier tape, wherein the fixing device includes:

a fixed stage that is provided immovably to a base;

a movable stage that is arranged at a position overlapping with the fixed stage, and is moved together with the side guides;

a plurality of first locking holes that are formed on the movable stage at positions with different distance from a center line of a running path;

a plurality of second locking holes that are formed on the fixed stage with the same number to the first locking holes on a straight line parallel to the running path; and

a fastener that is selectively inserted into any one of a pair of the first locking holes and the second locking holes to fix the side guides.

At least one of side guides may include an auxiliary guide that is interposed between the side guides and the carrier tape so as to come into contact with the lateral edges of the carrier and guide the movement of the carrier tape.

The auxiliary guide may include a guide member that is elastically supported by the side guides and comes into contact with the lateral edges of the carrier tape and displaces the carrier tape in a width direction of the carrier tape.

The guide member may rotate in contact with the lateral edges of the carrier tape that runs.

~~The fixing device may include: a fixed stage that is provided immovably to a base; a movable stage that is arranged at a position overlapping with the fixed stage, and is moved together with the side guides; a plurality of first locking holes that are formed on the fixed stage at positions with different distance from a center line of a running path; a plurality of second locking holes that are formed on the movable stage with the same number to the first locking holes on a straight line parallel to the~~

~~running path; and a fastener that is selectively inserted into any one of a pair of the first locking holes and the second locking holes to fix the side guides.~~

~~The fixing device may include: a fixed stage that is provided immovably to a base; a movable stage that is arranged at a position overlapping with the fixed stage, and is moved together with the side guides; a plurality of first locking holes that are formed on the movable stage at positions with different distance from a center line of a running path; a plurality of second locking holes that are formed on the fixed stage with the same number to the first locking holes on a straight line parallel to the running path; and a fastener that is selectively inserted into any one of a pair of the first locking holes and the second locking holes to fix the side guides.~~

Marks for identifying to which of the plurality of types of widths the first locking holes and the second locking holes correspond to may be provided. Diameters of the first locking holes and the second locking holes may have sizes that can visually recognize how much a mutual overlap is. The first locking holes and the second locking holes may be through holes.

A part of the fastener may be exposed to an outside when the fastener is inserted into any one of the pair of the first locking holes and the second locking holes.

An inner surface of at least either one of the first locking holes and the second locking holes may include a first tapered portion having a surface inclined with relative to a vertical direction. At least the part of the fastener may include a second tapered portion having a surface inclined along the first tapered portion. The first tapered portion and the second tapered portion may be a conical shape.

The carrier tape running apparatus may further include a restricting portion that restricts displacement of the position of the inserted fastener. The restricting portion may include fitting portions that are formed on at least either one of the first locking holes and the second locking holes, and on the part of the fastener, so as to be fitted to each other.

The carrier tape running apparatus may further include a linear guide that guides movement of the pair of side guides.

The carrier tape running apparatus may further include a bottom guide that is arranged at a position facing a bottom surface of the carrier tape that runs the running path, and is moved in directions coming close to and going away from the carrier tape. The carrier tape running apparatus may further include a lifting and lowering device that raises and lowers the bottom guide. The bottom guide

CLAIMS

1. A carrier tape running apparatus that transports a carrier tape in a longitudinal direction of the carrier tape, the carrier tape having pockets that are arrayed in the longitudinal direction and contain electronic components, the carrier tape running apparatus comprising:

a pair of side guides that are arranged on both sides of sandwiching the carrier tape so as to form a running path in the longitudinal direction, and are moved in directions of coming close to and going away from lateral edges of the carrier tape; and

a fixing device that fixes, in a stepwise manner, the pair of side guides at positions where the running path has widths corresponding to a plurality of types of widths of the carrier tape, wherein the fixing device includes:

a fixed stage that is provided immovably to a base;

a movable stage that is arranged at a position overlapping with the fixed stage, and is moved together with the side guides;

a plurality of first locking holes that are formed on the fixed stage at positions with different distance from a center line of a running path;

a plurality of second locking holes that are formed on the movable stage with the same number to the first locking holes on a straight line parallel to the running path; and

a fastener that is selectively inserted into any one of a pair of the first locking holes and the second locking holes to fix the side guides.

2. A carrier tape running apparatus that transports a carrier tape in a longitudinal direction of the carrier tape, the carrier tape having pockets that are arrayed in the longitudinal direction and contain electronic components, the carrier tape running apparatus comprising:

a pair of side guides that are arranged on both sides of sandwiching the carrier tape so as to form a running path in the longitudinal direction, and are moved in directions of coming close to and going away from lateral edges of the carrier tape; and

a fixing device that fixes, in a stepwise manner, the pair of side guides at positions where the running path has widths corresponding to a plurality of types of widths of the carrier tape, wherein the fixing device includes:

a fixed stage that is provided immovably to a base;

a movable stage that is arranged at a position overlapping with the fixed stage, and is moved together with the side guides;

a plurality of first locking holes that are formed on the movable stage at positions with different distance from a center line of a running path;

a plurality of second locking holes that are formed on the fixed stage with the same number to the first locking holes on a straight line parallel to the running path; and

a fastener that is selectively inserted into any one of a pair of the first locking holes and the second locking holes to fix the side guides.

3. The carrier tape running apparatus according to claim 1 or 2, wherein at least one of side guides comprises an auxiliary guide that is interposed between the at least one of the pair of side guides and the carrier tape so as to come into contact with the lateral edges of the carrier tape and guide the movement of the carrier tape.

4. The carrier tape running apparatus according to any one of claims 1 to 3, wherein the auxiliary guide comprises a guide member that is elastically supported by the side guides and comes into contact with the lateral edges of the carrier

tape and displaces the carrier tape in a width direction of the carrier tape.

5. The carrier tape running apparatus according to any one of claims 1 to 4, wherein the guide member rotates in contact with the lateral edges of the carrier tape that runs.

6. The carrier tape running apparatus according to any one of claims 1 to 5, wherein the carrier tape running apparatus comprises marks for distinguishing to which of the plurality of types of widths the first locking holes and the second locking holes correspond to may be provided.

7. The carrier tape running apparatus according to any one of claims 1 to 6, wherein diameters of the first locking holes and the second locking holes may have sizes that can visually recognize how much a mutual overlap is.

8. The carrier tape running apparatus according to any one of claims 1 to 7, wherein the first locking holes and the second locking holes are through-holes.

9. The carrier tape running apparatus according to any one of claims 1 to 8, wherein, a part of the fastener exposes to an outside when the fastener is inserted into any one of the pair of the first locking holes and the second locking holes.

10. The carrier tape running apparatus according to any one of claims 1 to 9, wherein:

an inner surface of at least either one of each of the first locking holes and each of the second locking holes comprises a first tapered portion having a surface inclined relative to a vertical direction; and

at least the part of the fastener comprises a second tapered portion having a surface inclined along the first tapered portion.

11. The carrier tape running apparatus according to claim 10, wherein the first tapered portion and the second tapered portion are a conical shape.

12. The carrier tape running apparatus according to any one of claims 1 to 11, further comprising a restricting portion that restricts a displacement of the position of the fastener that is inserted, the restricting portion may include fitting

portions that are formed on at least either one of the first locking holes and the second locking holes, and on the part of the fastener, so as to be fitted to each other.

13. The carrier tape running apparatus according to claim 12, wherein the restricting portion comprises fitting portions that are formed on at least either one the first locking holes and the second locking holes, and on the part of the fastener so as to be fitted to each other.

14. The carrier tape running apparatus according to any one of claims 1 to 13, further comprising a linear guide that guides a movement of the side guides.

15. The carrier tape running apparatus according to any one of claims 1 to 14, further comprising a bottom guide that is arranged at a position facing a bottom surface of the carrier tape runs the running path, and is moved in directions of coming close to and going away from the carrier tape.

16. The carrier tape running apparatus according to claim 15, further comprising a lifting and lowering device that raises and lowers the bottom guide.

17. The carrier tape running apparatus according to claim 15 or 16, wherein:

the bottom guide comprises a sucking portion that sucks the electronic components through suction holes formed in bottom surfaces of the pockets;

the bottom guide has a width smaller than widths of the carrier tape; and,

between the bottom guide and the pair of side guides, clearances that allow the side guides to move in the width direction are formed.

18. The carrier tape running apparatus according to any one of claims 1 to 17, further comprising:

a sprocket that hooks and runs the carrier tape;

a motor that turns the sprocket;

a reel wound with a seal tape attaching the carrier tape;

a pair of blocks that can move close to and apart from the running paths of the carrier tape and bonds the seal tape to the carrier tape by sandwiching the seal tape pulled out from the reel, and the carrier tape; and

a press roller that can move close to and apart from the running paths of the carrier tape;

wherein:

the taping apparatus pulls out the seal tape from the reel, approximates the press roller to the running paths of the carrier tape, approximate the pair of blocks, and seals the carrier tape by the seal tape.

CLAIMS

1. A carrier tape running apparatus that transports a carrier tape in a longitudinal direction of the carrier tape, the carrier tape having pockets that are arrayed in the longitudinal direction and contain electronic components, the carrier tape running apparatus comprising:

a pair of side guides that are arranged on both sides of sandwiching the carrier tape so as to form a running path in the longitudinal direction, and are moved in directions of coming close to and going away from lateral edges of the carrier tape; and

a fixing device that fixes, in a stepwise manner, the pair of side guides at positions where the running path has widths corresponding to a plurality of types of widths of the carrier tape.

2. The carrier tape running apparatus according to claim 1, wherein at least one of side guides comprises an auxiliary guide that is interposed between the at least one of the pair of side guides and the carrier tape so as to come into contact with the lateral edges of the carrier tape and guide the movement of the carrier tape.

3. The carrier tape running apparatus according to claim 2, wherein the auxiliary guide comprises a guide member that is elastically supported by the side guides and comes into contact with the lateral edges of the carrier tape and displaces the carrier tape in a width direction of the carrier tape.

4. The carrier tape running apparatus according to claim 3, wherein the guide member rotates in contact with the lateral edges of the carrier tape that runs.

5. The carrier tape running apparatus according to any one of claims 1 to 4, wherein the fixing device comprises:

a fixed stage that is provided immovably to a base;

a movable stage that is arranged at a position of being overlapping with the fixed stage, and is moved together with the side guides;

a plurality of first locking holes that are formed on the fixed stage at positions with different distance from a center line of the running path;

a plurality of second locking holes that are formed on the movable stage with the same number to the plurality of first locking holes along a straight line parallel to the running path; and

a fastener that is selectively inserted into any one of pairs of the first locking holes and the second locking holes to fix the side guides.

6. The carrier tape running apparatus according to any one of claims 1 to 4, wherein the fixing device comprises:

a fixed stage that is provided immovably to a base;

a movable stage that is arranged at a position overlapping with the fixed stage, and is moved together with the side guides;

a plurality of first locking holes that are formed on the movable stage at positions with different distance from a center line of the running path;

a plurality of second locking holes that are formed on the fixed stage with the same number to the plurality of first locking holes along a straight line parallel to the running path; and

a fastener that is selectively inserted into any one of pairs of the first locking holes and the second locking holes to fix the side guides.

7. The carrier tape running apparatus according to claim 5 or 6, wherein the carrier tape running apparatus comprises marks for distinguishing to which of the plurality

of types of widths the first locking holes and the second locking holes correspond to may be provided.

8. The carrier tape running apparatus according to any one of claims 5 to 7, wherein diameters of the first locking holes and the second locking holes may have sizes that can visually recognize how much a mutual overlap is.

9. The carrier tape running apparatus according to any one of claims 5 to 8, wherein the first locking holes and the second locking holes are through-holes.

10. The carrier tape running apparatus according to any one of claims 5 to 9, wherein, a part of the fastener exposes to an outside when the fastener is inserted into any one of the pair of the first locking holes and the second locking holes

11. The carrier tape running apparatus according to any one of claims 5 to 10, wherein:

an inner surface of at least either one of each of the first locking holes and each of the second locking holes comprises a first tapered portion having a surface inclined relative to a vertical direction; and

at least the part of the fastener comprises a second tapered portion having a surface inclined along the first tapered portion.

12. The carrier tape running apparatus according to claim 11, wherein the first tapered portion and the second tapered portion are a conical shape.

13. The carrier tape running apparatus according to any one of claims 5 to 12, further comprising a restricting portion that restricts a displacement of the position of the fastener that is inserted, the restricting portion may

include fitting portions that are formed on at least either one of the first locking holes and the second locking holes, and on the part of the fastener, so as to be fitted to each other

14. The carrier tape running apparatus according to claim 13, wherein the restricting portion comprises fitting portions that are formed on at least either one the first locking holes and the second locking holes, and on the part of the fastener so as to be fitted to each other.

15. The carrier tape running apparatus according to any one of claims 1 to 14, further comprising a linear guide that guides a movement of the side guides.

16. The carrier tape running apparatus according to any one of claims 1 to 15, further comprising a bottom guide that is arranged at a position facing a bottom surface of the carrier tape runs the running path, and is moved in directions of coming close to and going away from the carrier tape.

17. The carrier tape running apparatus according to claim 16, further comprising a lifting and lowering device that raises and lowers the bottom guide.

18. The carrier tape running apparatus according to claim 16 or 17, wherein:

the bottom guide comprises a sucking portion that sucks the electronic components through suction holes formed in bottom surfaces of the pockets;

the bottom guide has a width smaller than widths of the carrier tape; and,

between the bottom guide and the pair of side guides, clearances that allow the side guides to move in the width direction are formed.

19. The carrier tape running apparatus according to any one of claims 1 to 18, further comprising:

a sprocket that hooks and runs the carrier tape;

a motor that turns the sprocket;

a reel wound with a seal tape attaching the carrier tape;

a pair of blocks that can move close to and apart from the running paths of the carrier tape and bonds the seal tape to the carrier tape by sandwiching the seal tape pulled out from the reel, and the carrier tape; and

a press roller that can move close to and apart from the running paths of the carrier tape;

wherein:

the taping apparatus pulls out the seal tape from the reel, approximates the press roller to the running paths of the carrier tape, approximate the pair of blocks, and seals the carrier tape by the seal tape.