at a diagonal position to the aligning apparatus 100. The two aligning apparatuses 100,100' clamp and push a plurality of objects 200 to stack the objects 200 neatly in a stacked area A. The stacked area A is located on a plane formed by a first axis Y and a second axis X which is perpendicular to the first axis Y. A boundary of the stacked area A includes a first edge a1 and a second edge a2, wherein the first edge a1 is parallel to the first axis Y, and the second edge a2 is parallel to the second axis X.

[0026] The objects 200 have the same plane shape and the same plane area. After the objects 200 are stacked neatly in the stacked area A along a third axis Z, a plurality of projections of the objects 200 on the plane formed by the first axis Y and the second axis X is completely overlapped, wherein the third axis Z is perpendicular to the first axis Y and the second axis X.

[0027] As illustrated in Fig. 2 to Fig. 5, since the aligning apparatus 100 and the aligning apparatus 100' have a same structure and a same operation, merely the aligning apparatus 100 is described hereinafter. The aligning apparatus 100 includes a stand 10, a supporting post 20, a moving member 30, a connecting rod unit 40, and an aligning assembly 50. The stand 10 includes a plurality of feet 12 which forms a horizontal plane 10a, wherein the horizontal plane 10a is parallel to the plane formed by the first axis Y and the second axis X. The supporting post 20 is disposed on the stand 10, wherein a longitudinal axis of the supporting post 20 is perpendicular to the horizontal plane 10a of the stand 10. The supporting post 20 is disposed with two slide splines 22 and a screw rod 24 along the longitudinal axis of the supporting post 20. The two slide splines 22 are connected to the moving member 30 and are used as a tspline of the moving member 30 in the third axis Z. The screw rod 24 includes a transmission member 26 which is passed through by the screw rod 24 and is engaged with the moving member 30. In the current embodiment, the aligning apparatus 100 further includes a first driving unit 60, wherein the first driving unit 60 is a motor as an example. The first driving unit 60 is securely disposed to the supporting post

20, and a belt 62 is connected between the first driving unit 60 and the screw rod 24. When the first driving unit 60 activates to drive the belt 62 to activate, the belt 62 drives the screw rod 24 to rotate, and the screw rod 24 which is rotating drives the transmission member 26 to move up and down along the third axis Z, wherein the transmission member 26 drives the moving member 30 to simultaneously move with the transmission member 26 along the two slide splines 22 of the supporting post 20. The moving member 30 has an extension plate 32 which extends away from the supporting post 20 along an extending direction perpendicular to the longitudinal axis of the supporting post 20, wherein the extending direction is parallel to the first axis Y. The extension plate 32 has a first end 30a and a second end 30b which is opposite to the first end 30a, and the first end 30a is closer to the supporting post 20 than the second end 30b.

[0028] As illustrated in Fig. 4 and Fig. 5, the connecting rod unit 40 includes a first moving assembly 42, a second moving assembly 44, and a linkage rod 46. The first moving assembly 42 and the second moving assembly 44 are constantly disposed in parallel, and two ends of the linkage rod 46 are respectively pivotally connected to the first moving assembly 42 and the second moving assembly 44. The first moving assembly 42 has a first moving rod 422 and a first positioning unit 424, and the second moving assembly 44 has a second moving rod 442 and a second positioning unit 444. A length of the first moving rod 422 is equal to a length of the second moving rod 442. The first moving rod 422 is a straight rod, which is long, and slidably passes through the first positioning unit 424, wherein the first positioning unit 424 is pivotally connected to the first end 30a of the extension plate 32. Similarly, the second moving rod 442 is a straight rod, which is long, and slidably passes through the second positioning unit 444, wherein the second positioning unit 444 is pivotally connected to the second end 30b of the extension plate 32 and could be manipulated by the second moving rod 442 to rotate relative to the extension plate 32. A length of the linkage rod 46 is equal to a distance between the first end 30a and the second end 30b of the

extension plate 32, and the two ends of the linkage rod 46 are respectively pivotally connected to the first moving rod 422 and the second moving rod 442. The linkage rod 46 could control the second moving rod 442 to move relative to the second positioning unit 444, and a longitudinal axis of the linkage rod 46 is parallel to the extending direction of the extension plate 32, namely that the longitudinal axis of the linkage rod 46 is parallel to the first axis Y.

[0029] The aligning apparatus 100 further includes a second driving unit 70 and a third driving unit 80, wherein the second driving unit 70 is disposed to a bottom surface of the extension plate 32 at the first end 30a and corresponds to the first positioning unit 424, wherein the bottom surface of the extension plate 32 faces the feet 12 of the stand 10. The second driving unit 70 could manipulate the first positioning unit 424 to rotate relative to the extension plate 32. The third driving unit 80 is disposed on a top surface of the first positioning unit 424 and is connected to the first moving rod 422 to manipulate the first moving rod 422 to move relative to the first positioning unit 424, wherein the top surface of the first positioning unit 424 and a bottom surface of the extension plate 32 face opposite directions. More specifically, in the current embodiment, the third driving unit 80 is a motor as an example. A shaft of the third driving unit 80 has a gear 80a which is meshed with a spline 422a of the first moving rod 422. When the third driving unit 80 rotates, the gear 80a turns a rotary motion manipulated by the motor into a linear motion of the spline 422a to move the first moving rod 422 relative to the first positioning unit 424.

[0030] When the first positioning unit 424 is manipulated by the second driving unit 70 to rotate relative to the extension plate 32, the first positioning unit 424 drives the first moving rod 422 to rotate simultaneously. When the first moving rod 422 rotates, the second moving rod 442 is driven by the first moving rod 422 via the linkage rod 46 to rotate simultaneously, thereby driving the second positioning unit 444 to simultaneously rotate

relative to the extension plate 32 in the same direction as the rotating of the second moving rod 442.

[0031] When the first moving rod 422 is manipulated by the third driving unit 80 to move along a longitudinal axis of the first moving rod 422, the first moving rod 422 drives the second moving rod 442 via the linkage rod 46 to simultaneously move relative to the second positioning unit 444 in the same direction as the moving direction of the first moving rod 422.

[0032] The aligning assembly 50 is adapted to push one of the objects 200 and includes a first aligning plate 52 and a second aligning plate 54. As illustrated in Fig. 5 and Fig. 7, the first aligning plate 52 has a first aligning side52a facing the objects 200, and the second aligning plate 54 has a second aligning side54a facing the objects 200, wherein the first aligning side52a is parallel to the first edge a1 of the stacked area A, and the second aligning side54a is parallel to the second edge a2 of the stacked area A. The aligning assembly 50 is pivotally connected to the connecting rod unit 40. More specifically, the first aligning plate 52 is pivotally connected to the first moving rod 422 and the second moving rod 442, and the second aligning plate 54 is pivotally connected to an end of the first aligning plate 52, wherein a turning angle C1 is formed at a connection site between the first aligning plate 52 and the second aligning plate 54. When the first moving rod 422 and the second moving rod 442 operate, the aligning assembly 50 is driven by the first moving rod 422 and the second moving rod 442 to move simultaneously, but not to rotate simultaneously.

[0033] Additionally, the aligning apparatus 100 further includes a fourth driving unit 90. In the current embodiment, the fourth driving unit 90 is a motor as an example and is disposed on a pivotal portion of the second aligning plate 54, where the second aligning plate 54 is pivotally connected to the end of the first aligning plate 52. The second aligning plate 54 could be manipulated by the fourth driving unit 90 to rotate between a horizontal position Pa and a vertical position Pb. When the second aligning plate 54 is located in the

[0037] As illustrated in Fig. 7, in the first step S1, when a corner C2 of the first object 201 is excessively away from a corner of the stacked area A that is supposed to correspond to the corner C2, the following step is conducted. As illustrated in Fig. 8, the first positioning unit 424 is manipulated by the second driving unit 70 to rotate and drives the first moving rod 422 of the first moving assembly 42 to rotate simultaneously in the same direction as the rotating direction of the first positioning unit 424 to make the longitudinal axis of the first moving rod 422 parallel to the aligning direction D. When the first moving rod 422 rotates, the second moving rod 442 of the second moving assembly 44 is driven by the first moving rod 422 via the linkage rod 46 to rotate simultaneously. When the second moving rod 442 rotates, the second moving rod 442 drives the second positioning unit 444 of the second moving assembly 44 to rotate simultaneously in the same direction as the rotating direction of the second moving rod 442. The first moving rod 422 is manipulated by the third driving unit 80 to move forward (i,e, toward the first objects 201 along the longitudinal axis of the first moving rod 422), driving the second moving rod 442 via the linkage rod 46 to simultaneously move in the same direction as the moving direction of the first moving rod 422, thereby the first moving rod 422 and the second moving rod 442 drive the aligning assembly 50. As illustrated in Fig. 9, the aligning assembly 50 pushes the first object 201 until a center of the projection of the first object 201 on the plane formed by the first axis Y and the second axis X is completely overlapped with a center of the stacked area A. More specifically, during a process that the aligning assembly 50 pushes the first object 201, the first aligning side52a of the aligning assembly 50 abuts against an edge of the corner C2 of the first object 201 which corresponds to the first edge a1; the second aligning side54a abuts against another edge of the corner C2 of the first object 201 which corresponds to the second edge a2.

[0038] In the second step S2, when the second object 202 is put on the first object 201, as shown in Fig. 10, the moving member 30 could be manipulated by the first driving

unit 60 to drive the connecting rod unit 40 and the aligning assembly 50 to move upward along the longitudinal axis of the supporting post 20 to make the first aligning plate 52 and the second aligning plate 54 correspond to the second object 202 on the third axis Z.

[0039] In the third step S3, the rotation of the first moving assembly 42 indicates that the first positioning unit 424 is manipulated by the second driving unit 70 to rotate. As illustrated in Fig. 11 and Fig. 12, the first positioning unit 424 drives the first moving assembly 42 to simultaneously rotate in the same direction as the rotating direction of the first positioning unit 424, so that the longitudinal axis of the first moving rod 422 is parallel to the aligning direction D. More specifically, the second driving unit 70 keeps rotating until the extending line of the aligning direction D passes through the turning angle C1, the corner C2 of the first object 201, and a corner C3 of the second object 202. When the first moving rod 422 rotates, the second moving rod 442 of the second moving assembly 44 is driven by the first moving rod 422 via the linkage rod 46 to simultaneously rotate. When the second moving rod 442 rotates, the second positioning unit 444 of the second moving assembly 44 is driven by the second moving rod 442 to simultaneously rotate in the same direction as the rotating direction of the second moving rod 442.

[0040] In the fourth step S4, moving the first moving assembly 42 indicates that the first moving rod 422 is manipulated by the third driving unit 80 to move forward (i.e. toward the first object 201 along the longitudinal axis of the first moving rod 422), and the second moving rod 442 is driven by the first moving rod 422 via linkage rod 46 to simultaneously move in the same direction as the moving direction of the first moving rod 422. The first moving rod 422 and the second moving rod 442 drive the aligning assembly 50 to push the second object 202 until the projection of the second object 202 on the plane formed by the first axis Y and the second axis X is completely overlapped with the projection of the first object 201, as shown in Fig. 12, that is, the turning angle C1, the corner C2 of first object 201, and the corner C3 of the second object 202 are projected at the same point. More

WHAT IS CLAIMED IS:

1. An aligning apparatus which is adapted to align a plurality of objects in a stacked area, wherein the aligning apparatus comprises:

a stand;

a supporting post disposed on the stand, wherein a longitudinal axis of the supporting post is perpendicular to a horizontal plane of the stand;

a moving member connected to the supporting post and being controllable to be moved relative to the supporting post along the longitudinal axis of the supporting post, wherein the moving member has an extension plate which extends away from the supporting post along an extending direction perpendicular to the longitudinal axis of the supporting post;

a connecting rod unit comprising a first moving assembly, a second moving assembly, and a linkage rod, wherein the first moving assembly is parallel to the second moving assembly; the first moving assembly and the second moving assembly are pivotally connected to the extension plate; the linkage rod is connected to the first moving assembly and the second moving assembly; the connecting rod unit is controllable to be moved relative to the extension plate; and

an aligning assembly pivotally connected to the connecting rod unit and adapted to push one of the plurality of objects; when the connecting rod unit activates, the aligning assembly is driven by the connecting rod unit to simultaneously move but not to rotate.

2. The aligning apparatus of claim 1, wherein the first moving assembly has a first moving rod and a first positioning unit which is connected to the first moving rod, and the first moving rod is manipulatable to move relative to the first positioning unit; the first positioning unit is pivotally connected to the extension plate and is manipulatable to rotate relative to the extension plate;

the second moving assembly has a second moving rod and a second positioning unit which is connected to the second moving rod, and the second moving rod is manipulatable

to move relative to the second positioning unit; the second positioning unit is pivotally connected to the extension plate and is manipulatable to rotate relative to the extension plate;

the linkage rod is connected to the first moving rod and the second moving rod, and the linkage rod is parallel to the extending direction of the extension plate;

when the first positioning unit is manipulated to rotate relative to the extension plate, the first moving rod is driven by the first positioning unit to simultaneously rotate; when the first moving rod rotates, the second moving rod is driven by the first moving rod via the linkage rod to rotate simultaneously; when the second moving rod rotates, the second positioning unit is driven by the second moving rod to simultaneously rotate relative to the extension plate in the same direction;

when the first moving rod is manipulated to move along a longitudinal axis of the first moving rod, the second moving rod is driven by the first moving rod via the linkage rod to simultaneously move relative to the second positioning unit in the same direction; the longitudinal axis of the first moving rod is parallel to an aligning direction;

the aligning assembly has a turning angle, the aligning direction is defined as a straight line passing through the turning angle and a corner of one of the plurality of objects, wherein the corner of one of the plurality of objects is closest to the aligning assembly.

3. The aligning apparatus of claim 2, wherein an end of the first moving rod is pivotally connected to the turning angle of the aligning assembly; when the first moving rod is manipulated to move along the longitudinal axis of the first moving rod, the corner of the objects is located on the longitudinal axis of the first moving rod.

4. The aligning apparatus of claim 2, wherein the aligning assembly comprises a first aligning plate and a second aligning plate; the aligning assembly is pivotally connected to the first moving rod and the second moving rod via the first aligning plate; the second aligning plate is connected to the first aligning plate, wherein the turning angle is formed at a connection site between the first aligning plate and the second aligning plate;

wherein a surface of the first aligning plate facing the plurality of objects is a first aligning surface, and a surface of the second aligning plate facing the plurality of objects is a second aligning surface; the first aligning side is parallel to a first edge of the stacked area, and the second aligning side is parallel to a second edge of the stacked area.

5. The aligning apparatus of claim 4, wherein the second aligning plate is pivotally connected to the first aligning plate and is manipulatable to rotate between a horizontal position and a vertical position;

wherein when the second aligning plate is in the horizontal position, the second aligning side is parallel to the second edge of the stacked area; when the second aligning plate is in the vertical position, the plurality of objects is manipulatable to move and passes the horizontal position of the second aligning plate.

6. The aligning apparatus of claim 4, wherein a first included angle is defined between the first moving rod and the linkage rod, and a second included angle is defined between the first moving rod and a longitudinal axis of the first aligning plate; the first included angle is equal to the second included angle.

7. The aligning apparatus of claim 4, wherein a length of the first moving rod is equal to a length of the second moving rod; the extension plate, the first moving rod, the second moving rod, and the linkage rod surrounds to form a parallelogram; the aligning assembly is controlled by the first moving rod and the second moving rod to move but not to rotate.

8. A method of aligning the plurality of objects by using the aligning apparatus of claim 1, wherein the plurality of objects comprises at least a first object and a second object; the method of aligning comprising following steps:

first step: putting the first object in the stacked area;

second step: putting the second object on the first object, wherein a projection of the second object and a projection of the first object has a same projected shape and a same projected area on the stacked area, but the projection of the second object is not completely

overlapped with the projection of the first object;

third step: rotating the first moving assembly to make a longitudinal axis of a first moving rod of the first moving assembly parallel to an aligning direction; the aligning direction is a straight direction from a turning angle of the aligning assembly to a corner of the first object that is nearest to the aligning assembly; when the first moving assembly is manipulated to rotate, the second moving assembly is driven by the first moving assembly via the linkage rod to simultaneously rotate;

fourth step: moving the first moving assembly, wherein the second moving assembly is driven by the first moving assembly via the linkage rod to simultaneously move in the same direction; the first moving assembly and the second moving assembly drive the aligning assembly, and the aligning assembly pushes the aligning assembly until the projection of the second object is completely overlapped with the projection of the first object.

9. The method of claim 8, wherein moving the first moving assembly mentioned in the third step is that a first positioning unit of the first moving assembly is manipulated to rotate; when the first positioning unit is manipulated to rotate, the first moving rod of the first moving assembly is driven by the first positioning unit to simultaneously rotate in the same direction; when the first moving rod rotates, a second moving rod of the second moving assembly is driven by the first moving rod via the linkage rod to simultaneously rotate; when the second moving rod rotates, a second positioning unit of the second moving assembly is driven by the second moving rod to simultaneously rotate in the same direction;

moving the first moving assembly mentioned in the fourth step is that moving the first moving rod of the first moving assembly toward the first object along the longitudinal axis of the first moving rod; when the first moving rod is moved along the longitudinal axis of the first moving rod, the second moving rod is driven by the first moving rod via the linkage rod to simultaneously move; the first moving rod and the second moving rod drives the aligning assembly to pushes the second object until the projection of the second object is

completely overlapped with the projection of the first object.

10. The method of claim 9, wherein an end of the first moving rod is pivotally connected to the turning angle of the aligning assembly; in the third step, the longitudinal axis of the first moving rod extends through the corner of the first object and the turning angle.

11. The method of claim 8, wherein the aligning assembly comprises a first aligning plate and a second aligning plate; the turning angle is formed at a connection site between the first aligning plate and the second aligning plate; in the fourth step, during a process that the aligning assembly pushes the second object, the first aligning side abuts against an edge of a corner of the second object, and the second aligning side abuts against another edge of the corner of the second object.

12. The method of claim 11, further comprising a fifth step: pivoting the second aligning plate from a horizontal position to a vertical position, wherein when the second aligning plate is in the vertical position, the first object and the second object are controllable to be moved and pass the horizontal position of the second aligning plate.

13. The method of claim 12, wherein when the second aligning plate is in the horizontal position, the second aligning plate is parallel to an edge of the stacked area; when the second aligning plate is in the vertical position, the second aligning plate is perpendicular to the stacked area.

14. The method of claim 8, wherein in the second step, the moving member is controllable to drive the connecting rod unit and the aligning assembly to move along the longitudinal axis of the supporting post.