

STACKING AND ALIGNING DEVICE AND METHOD FOR ALIGNING OBJECTS

BACKGROUND OF THE INVENTION

Technical Field

[0001] The present invention relates generally to a plate aligning device, and more particularly to a stacking and aligning device for aligning vertically stacked objects and a method for aligning objects.

Description of Related Art

[0002] Due to the limited space in the factory, a large number of goods are stacked and stored to reduce the storage space of the goods. In the early days, the stacking work needed to be carried out manually. With advantages in technology, machines that can replace manual stacking of goods have now been developed. However, the goods stacked by machines usually collapse due to irregular stacking, causing damage to the goods and increasing production costs. On the other hand, the manual stacking method is often limited by factors such as stacking height and item volume, and therefore the objects cannot be efficiently stacked.

[0003] Therefore, how to develop a plate aligning machine for aligning goods has become a major issue in the industry. For instance, a conventional plate aligning machine includes two aligning assemblies that can move up and down and move diagonally. However, the aligning assemblies have only two moving directions. Although it can achieve the effect of aligning the objects, the position of the objects cannot be accurately aligned, which affects the aligning effect.

BRIEF SUMMARY OF THE INVENTION

[0004] In view of the above, the primary objective of the present invention is to provide a stacking and aligning device and a method for aligning objects, which could improve a positional accuracy of stacking multiple objects neatly and improve the efficiency

of stacking and aligning objects.

[0005] The present invention provides a stacking and aligning device, which is adapted to neatly arrange a plurality of objects stacked on a plane, including a first aligning machine and a second aligning machine. The first aligning machine includes a first seat and a first aligning mechanism, wherein the first seat has a first fixing post, and a longitudinal direction of the first fixing post is perpendicular to the plane. The first aligning mechanism is connected to the first fixing post and is manipulable to move along the longitudinal direction of the first fixing post. The first aligning mechanism includes a first base, a first arm, and a second arm, wherein the first base is engaged with the first fixing post and has a longitudinal direction. The first arm is manipulable to move along the longitudinal direction of the first base. An end of the first arm is connected to the first base, and another end of the first arm is connected to the second arm. The second arm is manipulable to move along a longitudinal direction of the first arm. The second aligning machine includes a second seat and a second aligning mechanism, wherein the second seat has a second fixing post, and a longitudinal direction of the second fixing post is perpendicular to the plane. The second aligning mechanism is connected to the second fixing post and is manipulable to move along the longitudinal direction of the second fixing post. The second aligning mechanism includes a second base, at least one positioning member, and an aligning assembly, wherein the second base is engaged with the second fixing post. The at least one positioning member is pivotally connected to the second base and is manipulable to turn relative to the second base and has a moving direction. The aligning assembly is connected to the at least one positioning member and is manipulable to move along the moving direction of the at least one positioning member.

[0006] The present invention provides a method for aligning objects, including steps of: A. put a first object on a plane; B. put a second object on the first object, wherein orthographic profiles and areas of the second object and the first object are the same, and

the orthographic profiles of the second object and the first object incompletely overlap; C. manipulate the first aligning mechanism to move along the longitudinal direction of the first fixing post, thereby positioning the first aligning mechanism at a height between the first object and the second object; D. manipulate the second aligning mechanism to move along the longitudinal direction of the second fixing post, thereby positioning the second aligning mechanism at a height between the first object and the second object; E. manipulate the first arm to move along the longitudinal direction of the first base toward the second aligning machine, thereby pushing a surface of the first object and a surface of the second object via the first arm; F. manipulate the second arm to move along the longitudinal direction of the first arm toward the second aligning machine, thereby pushing another surface of the first object and another surface of the second object via the second arm; G. manipulate the aligning assembly to move along the moving direction of the at least one positioning member toward the first aligning machine, thereby pushing the other two adjacent surfaces of the first object and the other two adjacent surfaces of the second object via the aligning assembly.

[0007] With the aforementioned design, the first arm and the second arm of the first aligning mechanism of the first aligning machine and the aligning assembly of the second aligning mechanism of the second aligning machine could take step C to step G of the method for aligning objects to move toward each other in a diagonal direction, thereby allowing the orthographic profiles of the objects to completely overlap to achieve an effect of neatly arranging objects. Additionally, the aligning assembly aligning assembly could be manipulated to move synchronously without changing the orientation thereof, allowing the aligning assembly to move and align on two axes at the same time, improving the efficiency of aligning and arranging the objects.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0008] The present invention will be best understood by referring to the following

detailed description of some illustrative embodiments in conjunction with the accompanying drawings, in which

[0009] FIG. 1 is a perspective view of the stacking and aligning device according to an embodiment of the present invention;

[0010] FIG. 2 is a partially exploded view of the first aligning machine of the stacking and aligning device according to the embodiment of the present invention seen from another direction;

[0011] FIG. 3 is a perspective view of the first aligning mechanism of the first aligning machine according to the embodiment of the present invention seen from another direction;

[0012] FIG. 4 is a partially exploded view of the second aligning machine of the stacking and aligning device according to the embodiment of the present invention seen from another direction;

[0013] FIG. 5 is a perspective view of the second aligning mechanism of the second aligning machine according to the embodiment of the present invention;

[0014] FIG. 6 is a perspective view, showing FIG. 5 in another direction;

[0015] FIG. 7 is a front view of FIG. 1, showing the stacking and aligning device according to the embodiment of the present invention is in a state of use;

[0016] FIG. 8 is similar to FIG. 7, showing the height of the first aligning mechanism and the height of the second aligning mechanism are located between the first object and the second object;

[0017] FIG. 9 is a top view of FIG. 7, showing the orthographic profiles of the first object and the second object incompletely overlap;

[0018] FIG. 10 is similar to FIG. 9, showing the orthographic profiles of the first object and the second object completely overlap after the first aligning machine and the second aligning machine push the first object and the second object;

[0019] FIG. 11 is a flow chart of the method for aligning objects according to the embodiment of the present invention; and

[0020] FIG. 12 is a schematic view, showing the second aligning plate is turned to the vertical position.

DETAILED DESCRIPTION OF THE INVENTION

[0021] A stacking and aligning device 100 according to an embodiment of the present invention is illustrated in FIG. 1 to FIG. 11 and is adapted to neatly arrange a plurality of objects 200 stacked on a plane A, wherein the stacking and aligning device 100 includes a first aligning machine 10 and a second aligning machine 20. The first aligning machine 10 and the second aligning machine 20 located on two sides of the objects 200 respectively push the objects 200 in a diagonal direction of the objects 200 to stack and neatly arrange the objects 200 on the plane A.

[0022] In the current embodiment, a first axis X, a second axis Y, and a third axis Z, which are perpendicular to one another, are defined, wherein the plane A is formed on the first axis X and the second axis Y. The objects 200 have the same plane shape and the same plane area, thereby when the objects 200 are stacked and neatly arranged on the plane A, orthographic profiles of the objects 200 on the plane A would completely overlap.

[0023] Referring to FIG. 2 and FIG. 3, the first aligning machine 10 includes a first seat 12 and a first aligning mechanism 14, wherein the first seat 12 has a plurality of first fixing posts 122 arranged along the first axis X, and a longitudinal direction of each of the first fixing posts 122 is perpendicular to the plane A. The first aligning mechanism 14 is connected to the first fixing posts 122 and is manipulatable to move along the longitudinal direction of the first fixing posts 122.

[0024] The first aligning mechanism 14 includes a first base 141, a first arm 142, and a second arm 143, wherein the first base 141 is engaged with the first fixing posts 122, and the first base 141 has a longitudinal direction (not shown). In the current embodiment,

the longitudinal direction of the first base 141 is parallel to the first axis X. An end of the first arm 142 is connected to the first base 141, and another end of the first arm 142 is connected to the second arm 143, wherein the first arm 142 is manipulatable to move along the longitudinal direction of the first base 141. The second arm 143 is manipulatable to move along a longitudinal direction of the first arm 142, wherein the longitudinal direction of the first arm 142 is parallel to the second axis Y, and a longitudinal direction of the second arm 143 is parallel to the first axis X. In other words, the longitudinal direction of the first arm 142 is perpendicular to the longitudinal direction of the second arm 143.

[0025] Referring to FIG. 2, in the current embodiment, a way for realizing the manipulatable movement of the first aligning mechanism 14 along the longitudinal direction of the first fixing posts 122 (i.e., the third axis Z) is as follows: the first seat 12 includes a first threaded rod 124 and a first movable member 126, wherein a first slide rail 123 is disposed on each of the first fixing posts 122; a longitudinal direction of the first threaded rod 124 is parallel to the first slide rail 123 of each of the first fixing posts 122; a part of the first movable member 126 penetrates through the first threaded rod 124, while another part of the first movable member 126 is engaged with the first slide rails 123 in a slidable way; a first motor 30 is fixed on the first seat 12, and an output shaft of the first motor 30 is connected to the first threaded rod 124; the first base 141 of the first aligning mechanism 14 is engaged with the first movable member 126. In this way, when the first motor 30 operates, the first motor 30 drives the first threaded rod 124 to spin to drive the first movable member 126 to move up and down along the third axis Z, thereby the first aligning mechanism 14 disposed on the first movable member 126 could move along the longitudinal direction of the first fixing posts 122.

[0026] Referring to FIG. 3, in the current embodiment, a way for realizing the manipulatable movement of the first arm 142 along the longitudinal direction of the first base 141 (i.e., the first axis X) is as follows: a first gear rack 144, a first transmission member

145, and a plurality of second slide rails 146 are disposed on the first base 141 of the first aligning mechanism 14, wherein the first gear rack 144 and the second slide rails 146 are arranged along the third axis Z, and both a longitudinal direction of the first gear rack 144 and a longitudinal direction of the second slide rails 146 are parallel to the first axis X; the first transmission member 145 is engaged with the second slide rails 146 in a slidable way; a second motor 40 is fixed on the first transmission member 145, wherein an output shaft of the second motor 40 is connected to a gear (not shown), and the gear meshes with the first gear rack 144; the first arm 142 of the first aligning mechanism 14 is engaged with the first transmission member 145. In this way, when the second motor 40 operates, the second motor 40 drives the gear disposed on the second motor 40 to turn to drive the first transmission member 145 to move on the second slide rails 146 along the first axis X, thereby the first arm 142 disposed on the first transmission member 145 could move along the longitudinal direction of the first base 141.

[0027] Referring to FIG. 3, in the current embodiment, a way for realizing the manipulatable movement of the second arm 143 along the longitudinal direction of the first arm 142 (i.e., the second axis Y) is as follows: a belt transmission assembly 147 and a second transmission member 148 are disposed on the first arm 142, wherein the belt transmission assembly 147 includes a belt 147a and two fixing plates 147b; the two fixing plates 147b are fixed on the first arm 142 at a predetermined distance; the belt 147a fits around the fixing plates 147b; a part of the second transmission member 148 is fixed to the belt 147a and is located between the fixing plates 147b, and another part of the second transmission member 148 is fixed to an end of the second arm 143; a third motor 50 is fixed on the first arm 142, wherein an output shaft of the third motor 50 is connected to one of the fixing plates 147b. In this way, when the third motor 50 operates, the third motor 50 drives the entire belt transmission assembly 147 to turn to drive the second transmission member 148 to move on the first arm 142 along the second axis Y, thereby the second arm 143

disposed on the second transmission member 148 could move along the longitudinal direction of the first arm 142.

[0028] Referring to FIG. 4 to FIG. 6, the second aligning machine 20 includes a second seat 22 and a second aligning mechanism 24, wherein the second seat 22 has a second fixing post 222, and a longitudinal direction of the second fixing post 222 is perpendicular to the plane A. The second aligning mechanism 24 is connected to the second fixing post 222 and is manipulable to move along the longitudinal direction of the second fixing post 222.

[0029] The second aligning mechanism 24 includes a second base 241, at least one positioning member 242, 243, and an aligning assembly 244, wherein the second base 241 is engaged with the second fixing post 222. The at least one positioning member 242, 243 is pivotally connected to the second base 241 and is manipulable to rotate relative to the second base 241 and has a moving direction. In the current embodiment, the at least one positioning member includes a first positioning member 242 and a second positioning member 243.

[0030] The aligning assembly 244 includes a linkage assembly 245, a first aligning plate 246, and a second aligning plate 247, wherein the linkage assembly 245 includes a first movable bar 245a, a second movable bar 245b, and a connecting bar 245c. A length of the first movable bar 245a is equal to a length of the second movable bar 245b. An end of the first movable bar 245a and an end of the second movable bar 245b are respectively and pivotally connected to two ends of the connecting bar 245c, and another end of the first movable bar 245a and another end of the second movable bar 245b are pivotally connected to the first aligning plate 246, wherein the another end of the first movable bar 245a and the another end of the second movable bar 245b respectively penetrate through the first positioning member 242 and the second positioning member 243 in a slidable way. In this way, the first movable bar 245a and the second movable bar 245b of the aligning assembly

244 could be manipulated to stably move along a moving direction of the first positioning member 242 and a moving direction of the second positioning member 243. In the current embodiment, the moving direction of the first positioning member 242 is parallel to the first movable bar 245a, and the moving direction of the second positioning member 243 is parallel to the second movable bar 245b.

[0031] In the current embodiment, a distance between the another end of the first movable bar 245a and the another end of the second movable bar 245b is equal to a length of the connecting bar 245c, wherein the first movable bar 245a, the second movable bar 245b, the connecting bar 245c, and a part of the first aligning plate 246 form a four-bar linkage, thereby a longitudinal direction of the first aligning plate 246 could be kept in parallel to the first axis X, and a longitudinal direction of the second aligning plate 247 could be kept in parallel to the second axis Y.

[0032] Referring to FIG. 4, in the current embodiment, a way for realizing the manipulatable movement of the second aligning mechanism 24 along a longitudinal direction of the second fixing post 222 (i.e., the third axis Z) is as follows: the second seat 22 includes a second threaded rod 224 and a second movable member 226, and a third slide rail 223 is disposed on the second fixing post 222; a longitudinal direction of the second threaded rod 224 is parallel to the third slide rail 223 on the second fixing post 222; a part of the second movable member 226 is fixed on the second threaded rod 224, and another part of the second movable member 226 is engaged with the third slide rail 223 in a slidable way; a fourth motor 60 is fixed on the second seat 22, wherein an output shaft of the fourth motor 60 is connected to the second threaded rod 224; the second base 241 of the second aligning mechanism 24 is engaged with the second movable member 226. In this way, when the fourth motor 60 operates, the fourth motor 60 drives the second threaded rod 224 to spin to drive the second movable member 226 to move up and down along the third axis Z,

thereby the second aligning mechanism 24 disposed on the second movable member 226 could move along the longitudinal direction of the second fixing post 222.

[0033] Referring to FIG. 5 and FIG. 6, in the current embodiment, a way for realizing the manipulatable movement of the first movable bar 245a and the second movable bar 245b of the aligning assembly 244 along the moving direction of the first positioning member 242 and the moving direction of the second positioning member 243 is as follows: a second gear rack 248 is disposed on the first movable bar 245a; a fifth motor 70 is fixed to the first positioning member 242, wherein an output shaft of the fifth motor 70 is connected to a gear (not shown) meshing with the second gear rack 248. In this way, when the fifth motor 70 operates, the fifth motor 70 drives the gear connected to the output shaft of the fifth motor 70 to turn to drive the aligning assembly 244 having the second gear rack 248 to move along the moving direction of the first positioning member 242.

[0034] Referring to FIG. 5 and FIG. 6, in the current embodiment, a way for realizing the manipulatable rotation of the first positioning member 242 relative to the second base 241 is as follows: a sixth motor 80 is disposed on a bottom portion of the second base 241 and corresponds to the first positioning member 242; an output shaft of the sixth motor 80 is fixed to the first positioning member 242 to drive the first positioning member 242 to turn relative to the second base 241; when the first positioning member 242 is driven by the sixth motor 80 to turn relative to the second base 241, the first positioning member 242 drives the first movable bar 245a to synchronously turn; when the first movable bar 245a turns, the first movable bar 245a drives the second movable bar 245b to synchronously turn via the connecting bar 245c; when the second movable bar 245b turns, the second positioning member 243 is driven by the second movable bar 245b to synchronously turn relative to the second base 241. In this way, the moving direction of the aligning assembly 244 could be changed without changing an orientation of the first aligning plate 246 and an orientation of the second aligning plate 247.

[0035] The first aligning plate 246 and the second aligning plate 247 of the aligning assembly 244 are respectively parallel to the first axis X and the second axis Y. In other words, the longitudinal direction of the first aligning plate 246 is perpendicular to the longitudinal direction of the second aligning plate 247, and the first aligning plate 246, second aligning plate 247, the first arm 142, and the second arm 143 surround to form a rectangle.

[0036] With the aforementioned design, a method for aligning objects shown in FIG. 11 could be applied. Referring to FIG. 7 to FIG. 10, the objects 200 to be stacked and arranged by the stacking and aligning device 100 includes a first object 201 and a second object 202, wherein each of the objects 200 includes a first surface 200a, a second surface 200b, a third surface 200c, and a fourth surface 200d. More specifically, a side surface of each of the objects 200 facing the first arm 142 is defined as the first surface 200a; a side surface of each of the objects 200 facing the second arm 143 is defined as the second surface 200b, wherein the first surface 200a is adjacent to the second surface 200b, and an angle between the first surface 200a and the second surface 200b is a right angle; a side surface of each of the objects 200 facing the first aligning plate 246 is defined as the third surface 200c; a side surface of each of the objects 200 facing the second aligning plate 247 is defined as the fourth surface 200d, wherein the third surface 200c is adjacent to the fourth surface 200d. The method for aligning objects at least includes the following steps:

A. put a first object 201 on a plane A;

B. put a second object 202 on the first object 201, wherein an orthographic profile of the second object 202 and an orthographic profile of the first object 201 are the same, and an area of the second object 202 and an area of the first object 201 on the plane A are the same as well (as shown in FIG. 9); however, in the current step, the orthographic profile of the second object 202 and the orthographic profile of the first object 201 incompletely overlap;

C. manipulate the first aligning mechanism 14 to move along the longitudinal direction of the first fixing posts 122, thereby positioning the first aligning mechanism 14 at a height between the first object 201 and the second object 202;

D. manipulate the second aligning mechanism 24 to move along the longitudinal direction of the second fixing post 222, thereby positioning the second aligning mechanism 24 at a height between the first object 201 and the second object 202;

E. manipulate the first arm 142 to move along the longitudinal direction of the first base 141 toward the second aligning machine 20, thereby pushing the first surface 200a of the first object 201 and the first surface 200a of the second object 202 via the first arm 142;

F. manipulate the second arm 143 to move along the longitudinal direction of the first arm 142 toward the second aligning machine 20, thereby pushing the second surface 200b of the first object 201 and the second surface 200b of the second object 202 via the second arm 143;

G. manipulate the aligning assembly 244 to move toward the first aligning machine 10 along the moving direction of the first positioning member 242 and the moving direction of the second positioning member 243, thereby pushing the third surface 200c and the fourth surface 200d of the first object 201 that are adjacent and pushing the third surface 200c and the fourth surface 200d of the second object 202 that are adjacent via the aligning assembly 244.

[0037] In step C, referring to FIG. 7 and FIG. 8, the first motor 30 disposed on the first seat 12 drives the first threaded rod 124 to spin to drive the first movable member 126 to move upward along the third axis Z, thereby allowing the first arm 142 and the second arm 143 correspond to a part of the first object 201 and a part of the second object 202 on the third axis Z at the same time.

[0038] In step D, referring to FIG. 7 and FIG. 8, the fourth motor 60 disposed on the second seat 22 drives the second threaded rod 224 to spin to drive the second movable member 226 to move upward along the third axis Z, thereby allowing the first aligning plate 246 and the second aligning plate 247 correspond to a part of the first object 201 and a part of the second object 202 on the third axis Z at the same time.

[0039] In step E, referring to FIG. 9 and FIG. 10, the second motor 40 disposed on the first base 141 drives the gear of the second motor 40 to turn to drive the first transmission member 145 to move on the first gear rack 144 along the first axis X, thereby the first arm 142 disposed on the first transmission member 145 could move toward the second aligning machine 20 along the longitudinal direction of the first base 141 to allow the first arm 142 to push the first surface 200a of the first object 201 and the first surface 200a of the second object 202.

[0040] In step F, referring to FIG. 9 and FIG. 10, the third motor 50 disposed on the first arm 142 drives the entire belt transmission assembly 147 to turn, wherein the turning belt 147a drives the second transmission member 148 to move on the first arm 142 along the second axis Y, thereby the second arm 143 disposed on the second transmission member 148 could move toward the second aligning machine 20 along the longitudinal direction of the first arm 142 to allow the second arm 143 to push the second surface 200b of the first object 201 and the second surface 200b of the second object 202.

[0041] In step G, referring to FIG. 9 and FIG. 10, the fifth motor 70 disposed on the first positioning member 242 drives the gear connected to the fifth motor 70 to turn to drive the aligning assembly 244 having the second gear rack 248 to move toward the first aligning machine 10 along the moving direction of the first positioning member 242, thereby the first aligning plate 246 of the aligning assembly 244 could push the third surface 200c of the first object 201 and the third surface 200c of the second object 202, and the second aligning plate

247 of the aligning assembly 244 could push the fourth surface 200d of the first object 201 and the fourth surface 200d of the second object 202.

[0042] By manipulating the first arm 142 and the second arm 143 of the first aligning mechanism 14 and the aligning assembly 244 of the second aligning mechanism 24 to take step C to step G, the objects 200 stacked on the plane A could be arranged in order, so that the orthographic profiles of the objects 200 on the plane A could completely overlap.

[0043] Additionally, in a case that if the aligning assembly 244 cannot directly abut against the third surface 200c and the fourth surface 200d of the first object 201 and the third surface 200c and the fourth surface 200d of the second object 202, step G further includes: manipulate the first positioning member 242 to turn relative to the second base 241 to drive the aligning assembly 244 to turn to change the moving direction of the aligning assembly 244, until the aligning assembly 244 could abut against the third surface 200c and the fourth surface 200d of the first object 201 and the third surface 200c and the fourth surface 200d of the second object 202 at the same time.

[0044] In step G, when the sixth motor 80 disposed on the second base 241 manipulates the first positioning member 242 to turn relative to the second base, the first positioning member 242 drives the first movable bar 245a to simultaneously turn, and the first movable bar 245a drives the second movable bar 245b to simultaneously turn via the connecting bar 245c, and the second movable bar 245b drives the second positioning member 243 to simultaneously turn relative to the second base 241; when an extension line (not shown) of the moving direction of the first positioning member 242 passes through a corner where the first surface 200a and the second surface 200b intersect, the sixth motor 80 stops operating. In this way, the moving direction of the aligning assembly 244 could be changed, so that the aligning assembly 244 could directly abut against the third surface 200c

and the fourth surface 200d of the first object 201 and the third surface 200c and the fourth surface 200d of the second object 202 while moving.

[0045] However, in other embodiments, step C to step G are not limited to be executed sequentially, but could also be executed synchronously, or some steps could be executed synchronously.

[0046] Referring to FIG. 5 and FIG. 12, in the current embodiment, the second aligning plate 247 is pivotally connected to the first aligning plate 246, and a seventh motor 90 is fixed to the first aligning plate 246, wherein an output shaft of the seventh motor 90 is connected to the second aligning plate 247. In this way, the second aligning plate 247 could be driven by the seventh motor 90 to turn between a horizontal position Pa and a vertical position Pb, wherein when the second aligning plate 247 is located at the horizontal position Pa, the second aligning plate 247 could abut against the fourth surface 200d of at least one of the objects 200; when the second aligning plate 247 is located at the vertical position Pb, the second aligning plate 247 could not abut against the fourth surface 200d of the objects 200, so that the objects 200 could be moved to pass through the second aligning plate 247.

[0047] Referring to FIG. 12, the method for aligning objects further includes step H: manipulate the second aligning plate 247 to turn from the horizontal position Pa to the vertical position Pb to allow the first object 201 and the second object 202 to be moved to pass through the horizontal position Pa of the second aligning plate 247.

[0048] With the aforementioned design, the first arm and the second arm of the first aligning mechanism of the first aligning machine and the aligning assembly of the second aligning mechanism of the second aligning machine could take step C to step G of the method for aligning objects to move toward each other in a diagonal direction, thereby allowing the orthographic profiles of the objects to completely overlap to achieve an effect of neatly arranging objects, and aligning the objects with high accuracy. Additionally, the aligning assembly could be manipulated to move synchronously without changing the

orientation of the aligning assembly, allowing the aligning assembly to move and align on two axes at the same time, improving the efficiency of aligning and arranging the objects.

[0049] It must be pointed out that the embodiments described above are only some preferred embodiments of the present invention. All equivalent structures and methods which employ the concepts disclosed in this specification and the appended claims should fall within the scope of the present invention.

WHAT IS CLAIMED IS:

1. A stacking and aligning device, which is adapted to neatly arrange a plurality of objects stacked on a plane, comprising:

a first aligning machine, comprising a first seat and a first aligning mechanism, wherein the first seat has a first fixing post, and a longitudinal direction of the first fixing post is perpendicular to the plane; the first aligning mechanism is connected to the first fixing post and is manipulable to move along the longitudinal direction of the first fixing post; the first aligning mechanism comprises a first base, a first arm, and a second arm, wherein the first base is engaged with the first fixing post and has a longitudinal direction; the first arm is manipulable to move along the longitudinal direction of the first base; an end of the first arm is connected to the first base, and another end of the first arm is connected to the second arm; the second arm is manipulable to move along a longitudinal direction of the first arm; and

a second aligning machine, comprising a second seat and a second aligning mechanism, wherein the second seat has a second fixing post, and a longitudinal direction of the second fixing post is perpendicular to the plane; the second aligning mechanism is connected to the second fixing post and is manipulable to move along the longitudinal direction of the second fixing post; the second aligning mechanism comprises a second base, at least one positioning member, and an aligning assembly, wherein the second base is engaged with the second fixing post; the at least one positioning member is pivotally connected to the second base and is manipulable to turn relative to the second base and has a moving direction; the aligning assembly is connected to the at least one positioning member and is manipulable to move along the moving direction of the at least one positioning member.

2. The stacking and aligning device as claimed in claim 1, wherein when the first arm is manipulated to move along the longitudinal direction of the first base, the first arm is adapted to push a first surface of at least one of the objects; when the second arm is

manipulated to move along the longitudinal direction of the first arm, the second arm is adapted to push a second surface of at least one of the objects; the first surface is adjacent to the second surface.

3. The stacking and aligning device as claimed in claim 2, wherein the longitudinal direction of the first arm is perpendicular to a longitudinal direction of the second arm; an angle between the first surface and the second surface of the objects is a right angle.

4. The stacking and aligning device as claimed in claim 1, wherein the aligning assembly has a first aligning plate and a second aligning plate; when the aligning assembly is manipulated to move along the moving direction of the at least one positioning member, the first aligning plate and/or the second aligning plate are adapted to push a third surface and/or a fourth surface of the objects, wherein the third surface is adjacent to the fourth surface.

5. The stacking and aligning device as claimed in claim 4, wherein the second aligning plate is pivotally connected to the first aligning plate and is manipulated to turn between a horizontal position and a vertical position; when the second aligning plate is located at the horizontal position, the second aligning plate is adapted to abut against the fourth surface of at least one of the objects; when the second aligning plate is located at the vertical position, the second aligning plate does not abut against the fourth surface of the objects, thereby the objects are adapted to be moved to pass through the second aligning plate.

6. The stacking and aligning device as claimed in claim 1, wherein the longitudinal direction of the first arm is perpendicular to a longitudinal direction of the second arm; a longitudinal direction of the first aligning plate is perpendicular to a longitudinal direction of the second aligning plate; the first arm, the second arm, the first aligning plate, and the second aligning plate surround to form a rectangle.

7. A method for aligning objects by using the stacking and aligning device as claimed in claim 1, comprising steps of:

A. putting a first object on a plane;

B. putting a second object on the first object, wherein orthographic profiles and areas of the second object and the first object are the same, and the orthographic profiles of the second object and the first object incompletely overlap;

C. manipulating the first aligning mechanism to move along the longitudinal direction of the first fixing post, thereby positioning the first aligning mechanism at a height between the first object and the second object;

D. manipulating the second aligning mechanism to move along the longitudinal direction of the second fixing post, thereby positioning the second aligning mechanism at a height between the first object and the second object;

E. manipulating the first arm to move along the longitudinal direction of the first base toward the second aligning machine, thereby pushing a surface of the first object and a surface of the second object via the first arm;

F. manipulating the second arm to move along the longitudinal direction of the first arm toward the second aligning machine, thereby pushing another surface of the first object and another surface of the second object via the second arm;

G. manipulating the aligning assembly to move along the moving direction of the at least one positioning member toward the first aligning machine, thereby pushing the other two adjacent surfaces of the first object and the other two adjacent surfaces of the second object via the aligning assembly;

wherein with step C to step G, the orthographic profiles of the first object and the second object completely overlap.

8. The method as claimed in claim 7, wherein when the aligning assembly is not allowed to directly push the two adjacent surfaces of the first object and the other two adjacent surfaces of the second object, step G further comprises: manipulating the at least one positioning member to turn relative to the second base to drive the aligning assembly to turn, until the aligning assembly abuts against the two adjacent surfaces of the first object and the

other two adjacent surfaces of the second object at the same time.

9. The method as claimed in claim 7, wherein the aligning assembly has a first aligning plate and a second aligning plate, which is pivotally connected to the first aligning plate and is manipulable to turn between a horizontal position and a vertical position; the method further comprises step H: manipulating the second aligning plate to turn from the horizontal position to the vertical position to allow the first object and the second object to be moved to pass through the horizontal position of the second aligning plate.