

Description

TRANSPORTATION DEVICE

This invention claims priority to patent inventions No. ZL202421024495.7, titled "TRANSPORTATION DEVICE", filed on May 11, 2024 with China National Intellectual Property Administration; No. ZL202410585435.0, titled "TRANSPORTATION DEVICE", filed on May 11, 2024 with China National Intellectual Property Administration; No. ZL202421024512.7, titled "TRANSPORTATION DEVICE", filed on May 11, 2024 with China National Intellectual Property Administration; No. ZL202421023197.6, titled "TRANSPORTATION DEVICE", filed on May 11, 2024 with China National Intellectual Property Administration; and No. ZL202421022947.8, titled "HEATING PAD, BASE ASSEMBLY, AND TRANSPORTATION DEVICE", filed on May 11, 2024 with China National Intellectual Property Administration.

Technical Field

The present invention relates to the field of material transportation, and particularly, to a transportation device.

Background

At present, turnover boxes are widely used for material packaging and transportation of liquid goods or granular or powdered goods. A turnover box generally includes a base and posts disposed on the base, the posts being detachably inserted into the base. When the turnover box is in a stored state, the posts need to be withdrawn from the base.

However, when the turnover box is in the stored state, the posts are completely detached from the base, which easily leads to the loss of the posts. Moreover, although the posts can be connected with the base via chains, the posts still need to be withdrawn from the base and then placed back onto the base, resulting in an increased workload and reduced work efficiency for workers.

Summary

A primary object of the present invention is to provide a transportation device to solve the problem of inconvenience in storing posts of a turnover box in the art known to inventors.

To achieve the object above, according to an aspect of the present invention, there is provided a transportation device placed on a supporting base surface, the transportation device including: a base; a plurality of post stoppers, spaced apart on the base along a circumferential direction of the

base, wherein a first end of each of the plurality of post stoppers passes through the base and extends to a side of the base close to the supporting base surface, and a second end of the each of the plurality of post stoppers is located on a side of the base away from the supporting base surface; a plurality of posts, mounted in one-to-one correspondence on the plurality of post stoppers, wherein each of the plurality of posts is located on a side of the base away from the supporting base surface, and the each of the plurality of posts is movably disposed relative to a corresponding post stopper of the plurality of post stoppers to have a deployed position perpendicular to the base and a stowed position parallel to the base; and a plurality of quick clamps, disposed in one-to-one correspondence with the plurality of post stoppers and the plurality of posts, wherein each of the plurality of quick clamps includes a first assembly and a second assembly, the first assembly is connected with a corresponding post of the plurality of posts, and the second assembly is connected with a corresponding post stopper of the plurality of post stoppers, the first assembly and the second assembly being configured to be connectable with or detachable from each other, such that each of the plurality of quick clamps has a locking position for locking the deployed position of a post corresponded with a quick clamp and an unlocking position for releasing the post corresponded with the quick clamp.

In some embodiments, the base is a rectangular plate body, each of a number of the plurality of post stoppers, a number of the plurality of posts, and a number of the plurality of quick clamps is four, and four post stoppers are disposed in one-to-one correspondence at four corners of the base; and when four posts are in the stowed position, an included angle between each of the four posts and a diagonal line of the base corresponding to a corresponding corner is an acute angle; or distances between each pair of adjacent posts of the four posts and the base are different; or an included angle between each of the four posts and a diagonal line of the base corresponding to the corresponding corner is an acute angle; and distances between each pair of adjacent posts of the four posts and the base are different.

In some embodiments, the first assembly includes a first mounting base, the first mounting base being mounted on a post corresponded with the first assembly; and the second assembly includes: a second mounting base, located on a side of the first mounting base close to the base and mounted on a post stopper corresponded with the second assembly; a handle portion, an end of the handle portion is rotatably connected with the second mounting base, an other end of the handle portion is configured to be inserted into or detached from the post stopper corresponded with the second assembly, wherein the post stopper corresponded with the second assembly is provided with a clearance hole for insertion of the other end of the handle portion; and a latching portion, an end of the latching portion is connected with a position between two ends of the handle

portion, and an other end of the latching portion is latched to or detached from the first mounting base.

In some embodiments, the first mounting base includes a first mounting plate and a latching plate connected with each other, the first mounting plate being disposed on a side of the post corresponded with the first assembly away from a center line of the base and fixedly connected with the post corresponded with the first assembly, and the latching plate being disposed on a side of the first mounting plate away from the post corresponded with the first assembly, and a latching recess into which the latching portion is latched is provided on a side of the latching plate away from the second mounting base.

In some embodiments, the handle portion includes a handle body and a first connecting shaft and a second connecting shaft mounted on the handle body, the first connecting shaft being located on a side of the second connecting shaft close to the first mounting base, and the first connecting shaft being hinged to the second mounting base; and the latching portion includes a first rod body and two second rod bodies respectively located at two ends of the first rod body, and connected with the first rod body, an end of each of the two second rod bodies away from the first rod body being hinged to the second connecting shaft.

In some embodiments, the handle body includes: a hinge portion, on which the first connecting shaft and the second connecting shaft being mounted, and the hinge portion being provided with a first mounting hole and a second mounting hole respectively used for mounting the first connecting shaft and the second connecting shaft; and an insertion portion, fixedly connected with the hinge portion and including an operation plate body and two insertion plate bodies located on a side of the operation plate body close to the post stopper corresponded with the second assembly and respectively connected with two ends of the operation plate body, wherein two clearance holes are spaced apart on the post stopper corresponded with the second assembly, and the two clearance holes are disposed correspondingly with the two insertion plate bodies.

In some embodiments, the second mounting base includes a second mounting plate and a handle connecting plate connected with each other, the second mounting plate being disposed on a side of the post stopper corresponded with the second assembly away from a center line of the base and fixedly connected with the post stopper corresponded with the second assembly, and the handle connecting plate being disposed on a side of the second mounting plate away from the post corresponded with the first assembly, and the handle connecting plate is provided with a connecting through hole for the first connecting shaft to pass through.

In some embodiments, each of the plurality of post stoppers includes a first plate body, a

second plate body, and a third plate body, the first plate body and the second plate body being disposed opposite to each other and being connected via the third plate body, and the third plate body being located on a side of the first plate body and the second plate body away from a center line of the base to define, to enclose a receiving space for receiving an end of a corresponding post of the plurality of posts with the first plate body and the second plate body, wherein a corresponding quick clamp of the plurality of quick clamps is mounted on a side of the third plate body away from the receiving space.

In some embodiments, at least one of the first plate body and the second plate body is provided with a strip guide hole extending in a direction perpendicular to the base; each of the plurality of post stoppers further includes a pin shaft inserted through a corresponding strip guide hole and fixedly connected with a post corresponded with a post stopper, the pin shaft being rotatable within the corresponding strip guide hole and movably disposed in an extension direction of the corresponding strip guide hole, so that the post corresponded with the post stopper is moveably disposed relative to the post stopper and a movement stroke of the post corresponded with the post stopper is limited.

In some embodiments, the post includes: a post body; a first limiting member, connected with the post body and at least partially located between the post body and the first plate body; a second limiting member, connected with the post body and at least partially located between the post body and the second plate body; and a third limiting member, connected with the post body and at least partially located between the post body and the third plate body.

In some embodiments, the post further includes: a first fastener and a first connecting plate, the first connecting plate being located within the post body and parallel to the first limiting member, wherein the first limiting member is a flat plate located between the post body and a post stopper corresponded with a post, a threaded end of the first fastener passing through the first limiting member and a side of the post body corresponded with the first connecting plate and being threadedly connected with the first connecting plate, a cap end of the first fastener being located on a side of the first limiting member away from the post body, and the first plate body being provided with a first clearance groove for avoiding the cap end of the first fastener; a second fastener and a second connecting plate, the second connecting plate being located within the post body and parallel to the second limiting member, wherein the second limiting member is a flat plate located between the post body and the post stopper corresponded with the post, a threaded end of the second fastener passing through the second limiting member and a side of the post body corresponded with the second connecting plate and being threadedly connected with the second connecting plate, a cap end of the second fastener being located on a side of the second limiting

member away from the post body, and the second plate body being provided with a second clearance groove for avoiding the cap end of the second fastener; and a third fastener and a third connecting plate, the third connecting plate being located within the post body and parallel to the third limiting member, wherein the third limiting member is a flat plate located between the post body and the post stopper corresponded with the post, a threaded end of the third fastener passing through the third limiting member and a side of the post body corresponded with the third connecting plate and being threadedly connected with the third connecting plate, a cap end of the third fastener being located on a side of the third limiting member away from the post body, and the third plate body being provided with a third clearance groove for avoiding the cap end of the third fastener.

In some embodiments, the post further includes: a first connecting plate, located within the post body and parallel to the first limiting member, wherein the first limiting member is a bolt, a threaded end of the first limiting member passing through a side of the post body corresponded with the first connecting plate and being threadedly connected with the first connecting plate, and a cap end of the first limiting member being located between the post body and the first plate body; a second connecting plate, located within the post body and parallel to the second limiting member, wherein the second limiting member is a bolt, a threaded end of the second limiting member passing through a side of the post body corresponded with the second connecting plate and being threadedly connected with the second connecting plate, and a cap end of the second limiting member being located between the post body and the second plate body; and a third connecting plate, located within the post body and parallel to the third limiting member, wherein the third limiting member is a bolt, a threaded end of the third limiting member passing through a side of the post body corresponded with the third connecting plate and being threadedly connected with the third connecting plate, and a cap end of the third limiting member being located between the post body and the third plate body.

In some embodiments, the first limiting member, the second limiting member, and the third limiting member are all flat plates between the post body and a post stopper corresponded with a post; and the post body includes a first post segment and a second post segment connected with each other, the first post segment being located on a side of the second post segment away from the base, and a distance between an outer peripheral surface of the first post segment and the post stopper corresponded with the post being greater than a distance between an outer peripheral surface of the second post segment and the post stopper corresponded with the post, wherein the first limiting member, the second limiting member, and the third limiting member are welded to the first post segment.

In some embodiments, the transportation device includes: a support, connected with the base; and a first discharge component, a second discharge component, and a third discharge component, which are spaced apart on the base in a first direction parallel to the base, wherein the base is made of plastic, and the support is made of metal.

In some embodiments, the first discharge component and the third discharge component are respectively located on opposite sides of the base, and the second discharge component is located at a central part of the base.

In some embodiments, the base is provided with: a first discharge groove, wherein the first discharge component is mounted in the first discharge groove, an inlet of the first discharge groove is located on a top surface of the base, and an outlet of the first discharge groove is located on a first side surface of the base; a second discharge groove, wherein the second discharge component is mounted in the second discharge groove, an inlet of the second discharge groove is located on the top surface of the base, and an outlet of the second discharge groove is located on a bottom surface of the base; and a third discharge groove, wherein the third discharge component is mounted in the third discharge groove, an inlet of the third discharge groove is located on the top surface of the base, and an outlet of the third discharge groove is located on a second side surface of the base.

In some embodiments, the first discharge component includes a first discharge valve which is mounted within the first discharge groove to open or close the first discharge groove; the second discharge component includes a second discharge valve which is mounted within the second discharge groove to open or close the second discharge groove; and the third discharge component includes a third discharge valve which is mounted within the third discharge groove to open or close the third discharge groove.

In some embodiments, the first discharge component includes a first discharge valve which is mounted within the first discharge groove to open or close the first discharge groove; and the base further includes a communication pipeline, and the base is provided with a mounting groove for mounting at least part of a communication pipeline, an inlet of the communication pipeline being configured to connect to a discharge port of a liquid bag, and an outlet of the communication pipeline being connected with an inlet of the first discharge valve.

In some embodiments, the third discharge component includes a protective member which is disposed within the third discharge groove and located on a side of the third discharge valve close to the inlet of the third discharge groove, to block the third discharge groove when discharge is not required.

In some embodiments, the support includes the plurality of post stoppers, and the support further includes: a plurality of first strip plates, disposed correspondingly with the plurality of post stoppers and spaced apart around a center line of the base to form a plurality of first intervals, wherein an end of each of the plurality of first strip plates is connected with a corresponding post stopper of the plurality of post stoppers, and an other end of each of the plurality of first strip plates is disposed toward the center line of the base; a plurality of second strip plates, spaced apart around the center line of the base, wherein the plurality of second strip plates are disposed in one-to-one correspondence within the plurality of first intervals, and two ends of each of the plurality of second strip plates are respectively connected with two corresponding first strip plates of the plurality of first strip plates; and wherein the base is provided with a plurality of first strip grooves for avoiding the plurality of first strip plates in one-to-one correspondence and a plurality of second strip grooves for avoiding the plurality of second strip plates in one-to-one correspondence.

In some embodiments, the support includes: a central supporting leg, located at a central part of the base and connected with the each of the plurality of first strip plates; and a plurality of peripheral supporting legs, spaced apart around the central supporting leg, wherein the plurality of peripheral supporting legs are disposed correspondingly with the plurality of post stoppers, and each of the plurality of peripheral supporting legs is located on a side of a corresponding post stopper of the plurality of post stoppers close to the supporting base surface and is connected with a post stopper corresponded with a peripheral supporting leg.

In some embodiments, a central supporting platform for contact with the central supporting leg, and a plurality of peripheral supporting platforms for contact with the plurality of peripheral supporting legs in one-to-one correspondence, are provided on a side of the base close to the supporting base surface.

In some embodiments, a third discharge groove is provided on the base, and the transportation device includes: a base socket, detachably mounted within the third discharge groove and being connected with an external power supply apparatus via an external wiring harness.

In some embodiments, the transportation device includes a heating pad which is disposed on the base, the heating pad including a heating pad body and a heating pad plug disposed on the heating pad body, the heating pad plug being plug-connected with the base socket.

In some embodiments, an inlet of the third discharge groove is located on a top surface of the base, and an outlet of the third discharge groove is located on a second side surface of the base; and the base is provided with a fixing plate escape groove which is configured for avoiding at least part of the heating pad plug, the fixing plate escape groove being disposed at the inlet of the third

discharge groove and in communication with the third discharge groove.

In some embodiments, the base socket includes a socket housing and a socket conductive component mounted on the socket housing, a first end of the socket housing being configured to receive insertion of a plug housing of a plug portion of the heating pad plug, a first end of the socket conductive component being configured for electrical contact with a plug conductive component of the plug portion, and a second end of the socket conductive component being connected with the external power supply apparatus via the external wiring harness.

In some embodiments, the socket housing includes: a socket connection portion, detachably connected with the base; a first socket portion, disposed on the socket connection portion and located on a side of the socket connection portion close to the outlet of the third discharge groove, to be connected with the external power supply apparatus via the external wiring harness; and a second socket portion, disposed on the socket connection portion and located on a side of the socket connection portion close to the inlet of the third discharge groove, for plug-in connection or disconnection with the heating pad plug.

In some embodiments, the socket housing further includes: a receiving cavity, disposed on the socket connection portion, the first socket portion being located within the receiving cavity; and a protective cover, movably disposed on the socket connection portion and located at an opening portion of the receiving cavity to open or close the receiving cavity.

In some embodiments, the transportation device includes a first discharge component, and the first discharge component and the base socket are switchably mounted within the third discharge groove.

In some embodiments, the heating pad plug includes a connection portion and a plug portion, the connection portion being connected with the heating pad body, and the plug portion being disposed on a side of the connection portion and connected with the connection portion, for plug-in connection or disconnection with the base socket; wherein the connection portion includes a first fixing plate and a second fixing plate, the plug portion being disposed on one of the first fixing plate and the second fixing plate; and the first fixing plate and the second fixing plate are respectively located on opposite sides of the heating pad body, and the first fixing plate, the heating pad body, and the second fixing plate are detachably connected via a plurality of first heating pad fasteners.

In some embodiments, the first fixing plate and the second fixing plate are strip plate bodies extending in a predetermined direction; one of the first fixing plate and the second fixing plate is provided with a plurality of first through holes, and an other of the first fixing plate and the second

fixing plate is provided with a plurality of first threaded holes; the heating pad body is provided with a plurality of second through holes; the plurality of first through holes, the plurality of first threaded holes, and the plurality of second through holes are disposed correspondingly with the plurality of first heating pad fasteners; and a threaded end of each of the plurality of first heating pad fasteners passes through a corresponding first through hole of the plurality of first through holes and a corresponding second through hole of the plurality of second through holes, and is then tightened into a corresponding first threaded hole of the plurality of first threaded holes.

In some embodiments, the first fixing plate and the second fixing plate each include a main plate body which is integrally injection-molded, one of the first fixing plate and the second fixing plate includes a plurality of second heating pad fasteners disposed on the main plate body, and the plurality of first threaded holes are disposed in one-to-one correspondence on the plurality of the second heating pad fasteners.

In some embodiments, the heating pad plug is detachably mounted at a position to be mounted via a plurality of second heating pad fasteners; one of the first fixing plate and the second fixing plate is provided with a plurality of third through holes, and another of the first fixing plate and the second fixing plate is provided with a plurality of fourth through holes; the heating pad body is provided with a plurality of fifth through holes; a plurality of second threaded holes are disposed at the position to be mounted; the plurality of third through holes, the plurality of fourth through holes, the plurality of fifth through holes, and the plurality of second threaded holes are disposed in one-to-one correspondence with the plurality of second heating pad fasteners; and a threaded end of each of the plurality of second heating pad fasteners passes through a corresponding third through hole of the plurality of third through holes, a corresponding fifth through hole of the plurality of fifth through holes, and a corresponding fourth through hole of the plurality of fourth through holes, and is then tightened into a corresponding second threaded hole of the plurality of second threaded holes.

In some embodiments, the plug portion includes: a plug housing, integrally injection-molded with one of the first fixing plate and the second fixing plate, wherein a side of the plug housing away from the heating pad body is configured to be in plug-in engagement with a socket housing of the base socket; and a plug conductive component, a first end of which passes through the plug housing and is electrically connected with the heating pad body, and a second end of which is located outside the plug housing for electrical contact with a socket conductive component of the base socket.

In some embodiments, the transportation device includes a base assembly including the base,

the heating pad, and the base socket, the base being provided with: a fixing plate escape groove, configured for avoiding one of the first fixing plate and the second fixing plate, the fixing plate escape groove being in communication with the third discharge groove.

In some embodiments, the heating pad plug is detachably mounted on the base via a plurality of second heating pad fasteners; a plurality of connecting nuts are disposed on a groove bottom surface of the fixing plate escape groove, the plurality of connecting nuts being disposed in one-to-one correspondence with the plurality of second heating pad fasteners; and a threaded end of each of the plurality of second heating pad fastener passes through the heating pad plug and is tightened into a second threaded hole on a corresponding connecting nut of the plurality of connecting nuts.

In some embodiments, the transportation device further includes a material storage apparatus which is disposed on the base and at least partially located between the plurality of posts.

In some embodiments, the material storage apparatus includes a receiving bag disposed above the base, the receiving bag including a bag body and a plurality of sleeve tubes spaced apart around a peripheral side of the bag body, wherein each of the plurality of sleeve tubes is connected with the bag body, the bag body is located between the plurality of posts, and the plurality of sleeve tubes are sleeved in one-to-one correspondence on the plurality of posts.

In some embodiments, the receiving bag further includes a plurality of handles spaced apart around the peripheral side of the bag body and each of the plurality of handles is connected with an end of the bag body away from the base, to move the bag body via the plurality of handles; or the material storage apparatus further includes a material storage barrel having a material storage position for placement within the bag body and a remove position for removal from the bag body.

By applying the technical solution of the present invention, the transportation device of the present invention is placed on a supporting base surface, the transportation device including: a base; a plurality of post stoppers, spaced apart on the base along a circumferential direction of the base, wherein a first end of each of the plurality of post stoppers passes through the base and extends to a side of the base close to the supporting base surface, and a second end of the each of the plurality of post stoppers is located on a side of the base away from the supporting base surface; a plurality of posts, mounted in one-to-one correspondence on the plurality of post stoppers, wherein each of the plurality of posts is located on a side of the base away from the supporting base surface, and the each of the plurality of posts is movably disposed relative to a corresponding post stopper of the plurality of post stoppers to have a deployed position perpendicular to the base and a stowed position parallel to the base; and a plurality of quick clamps, disposed in one-to-one

correspondence with the plurality of post stoppers and the plurality of posts, wherein each of the plurality of quick clamps includes a first assembly and a second assembly, the first assembly is connected with a corresponding post of the plurality of posts, and the second assembly is connected with a corresponding post stopper of the plurality of post stoppers, the first assembly and the second assembly being configured to be connectable with or detachable from each other, such that each of the plurality of quick clamps has a locking position for locking the deployed position of a post corresponded with a quick clamp and an unlocking position for releasing the post corresponded with the quick clamp, thereby solve the problem of inconvenience in storing the posts of the turnover box in the art known to inventors.

Brief Description of the Drawings

The drawings, which constitute a part of the present invention, are intended to provide a further understanding of the present invention. The schematic embodiments of the present invention and the description thereof are intended to explain, rather than unduly limit, the present invention. In the drawings:

FIG. 1 illustrates a schematic structural diagram in one direction of a transportation device according to a first embodiment of the present invention;

FIG. 2 illustrates a schematic structural diagram in another direction of a transportation device shown in FIG. 1;

FIG. 3 illustrates a partially enlarged view of a transportation device shown in FIG. 2;

FIG. 4 illustrates a schematic structural diagram of a transportation device shown in FIG. 1 when posts are not included;

FIG. 5 illustrates a partially enlarged view of a transportation device shown in FIG. 4;

FIG. 6 illustrates a top view of a transportation device shown in FIG. 4;

FIG. 7 illustrates a cross-sectional view of a transportation device shown in FIG. 6;

FIG. 8 illustrates a top view of a transportation device shown in FIG. 1;

FIG. 9 illustrates a schematic structural diagram of a transportation device according to a second embodiment of the present invention;

FIG. 10 illustrates a schematic structural diagram in one direction of a transportation device shown in FIG. 9 when posts are not included;

FIG. 11 illustrates a partially enlarged view of a transportation device shown in FIG. 10;

FIG. 12 illustrates a schematic structural diagram in one direction of a transportation device according to a third embodiment of the present invention;

FIG. 13 illustrates a top view of a transportation device shown in FIG. 12;

FIG. 14 illustrates a partially enlarged view of a transportation device shown in FIG. 13;

FIG. 15 illustrates a schematic structural diagram in one direction of a base of a transportation device shown in FIG. 4;

FIG. 16 illustrates a schematic structural diagram in another direction of a base of a transportation device shown in FIG. 4;

FIG. 17 illustrates a schematic structural diagram of a base socket of a transportation device shown in FIG. 16;

FIG. 18 illustrates a top view of a base socket of a transportation device shown in FIG. 16;

FIG. 19 illustrates a cross-sectional view of a base socket of a transportation device shown in FIG. 16;

FIG. 20 is a schematic structural diagram in one direction of a heating pad of a transportation device shown in FIG. 1;

FIG. 21 illustrates a partially enlarged view of a heating pad shown in FIG. 20;

FIG. 22 illustrates a schematic structural diagram in another direction of a heating pad shown in FIG. 20;

FIG. 23 illustrates a partially enlarged view of a heating pad shown in FIG. 22;

FIG. 24 illustrates a side view of a heating pad shown in FIG. 20;

FIG. 25 illustrates a schematic structural diagram of a heating pad body of a heating pad shown in FIG. 20;

FIG. 26 illustrates a schematic structural diagram of a base shown in FIG. 16 with a heating pad provided thereon;

FIG. 27 illustrates a front view of a transportation device according to a fourth embodiment of the present invention; and

FIG. 28 illustrates an explosion diagram of a transportation device according to the present invention.

The drawings above include the following reference numerals:

1. Base; 11. First discharge groove; 12. Second discharge groove; 13. Third discharge groove; 14. Mounting groove; 15. First strip groove; 16. Second strip groove; 17. Central supporting platform; 18. Peripheral supporting platform; 19. Auxiliary supporting platform; 110. Fixing plate escape groove; 1101. Second threaded hole; 101. First strip plate; 102. Second strip plate; 103. Central supporting leg; 104. Peripheral supporting leg; 105. Third strip plate; 106. Auxiliary supporting leg; 107. Supporting plate;

2. Post stopper; 20. Strip guide hole; 21 First plate body; 22. Second plate body; 23. Third plate body; 24. Pin shaft; 25. Clearance hole;

3. Post; 30. Post body; 301. First post segment; 302. Second post segment; 31. First limiting member; 32. Second limiting member; 33. Third limiting member; 34. First fastener; 35. Second fastener; 36. Third fastener; 37. First connecting plate; 38. Second connecting plate; 39. Third connecting plate;

4. Quick clamp; 41. First assembly; 42. Second assembly; 43. First mounting base; 431. First mounting plate; 432. Latching plate; 433. Latching recess; 44. Second mounting base; 441. Second mounting plate; 442. Handle connecting plate; 45. Handle portion; 451. Handle body; 452. First connecting shaft; 453. Second connecting shaft; 454. Hinge portion; 455. Insertion portion; 456. Operation plate body; 457. Insertion plate body; 46. Latching portion; 461. First rod body; 462. Second rod body;

5. First discharge component; 51. First discharge valve;

6. Second discharge component; 61. Second discharge valve;

7. Third discharge component; 71. Third discharge valve; 72. Protective member; 73. Base socket; 730. Socket housing; 731. First socket portion; 732. Second socket portion; 733. receiving cavity; 734. Protective cover; 735. Socket conductive component; 736. Socket connection portion;

8. Communication pipeline;

9. Heating pad; 90. Heating pad body; 901. Second through hole; 902. Fifth through hole; 903. Main plate body; 91. Heating pad plug; 92. Connection portion; 93. Plug portion; 931. Plug housing; 932. Plug conductive component; 94. First fixing plate; 941. First through hole; 942. Third through

hole; 95. Second fixing plate; 951. First threaded hole; 952. Fourth through hole; 96. Second heating pad fastener;

10. Material storage apparatus; 111. Receiving bag; 1111. Bag body; 1112. Sleeve tube; 1113. Handle; 112. Material storage barrel.

Detailed Description of the Embodiments

It is to be noted that, unless there is a conflict, embodiments of the present invention and features in the embodiments is combined with each other. The present invention is described in detail below with reference to the drawings and in conjunction with the embodiments.

As shown in FIGS. 1 to 26, the present invention provides a transportation device, the transportation device is placed on a supporting base surface, the transportation device including: a base 1; a plurality of post stoppers 2, spaced apart on the base 1 along a circumferential direction of the base 1, wherein a first end of each of the plurality of post stoppers 2 passes through the base 1 and extends to a side of the base 1 close to the supporting base surface, and a second end of the each of the plurality of post stoppers 2 is located on a side of the base 1 away from the supporting base surface; a plurality of posts 3, mounted in one-to-one correspondence on the plurality of post stoppers 2, wherein each of the plurality of posts 3 is located on a side of the base 1 away from the supporting base surface, and the each of the plurality of posts 3 is movably disposed relative to a corresponding post stopper 2 of the plurality of post stoppers 2 to have a deployed position perpendicular to the base 1 and a stowed position parallel to the base 1; and a plurality of quick clamps 4, disposed in one-to-one correspondence with the plurality of post stoppers 2 and the plurality of posts 3, wherein each of the plurality of quick clamps 4 includes a first assembly 41 and a second assembly 42, the first assembly 41 is connected with a corresponding post 3 of the plurality of posts 3, and the second assembly 42 is connected with a corresponding post stopper 2 of the plurality of post stoppers 2, the first assembly 41 and the second assembly 42 being configured to be connectable with or detachable from each other, such that each of the plurality of quick clamps 4 has a locking position for locking the deployed position of a post 3 corresponded with a quick clamp 4 and an unlocking position for releasing the post 3 corresponded with the quick clamp 4, thereby solve the problem of inconvenience in storing the posts of the turnover box in the art known to inventors.

Specifically, when the quick clamp 4 is in the locking position, the quick clamp 4 locks the corresponding post 3 in the deployed position; when the quick clamp 4 is in the unlocking position, the locking of the deployed position of the corresponding post 3 by the quick clamp 4 is released, so that the corresponding post 3 can switch from the deployed position to the stowed position.

As shown in FIGS. 1 to 14, the base 1 is a rectangular plate body, each of a number of the plurality of post stoppers 2, a number of the plurality of posts 3, and a number of the plurality of quick clamps 4 is four, and four post stoppers 2 are disposed in one-to-one correspondence at four corners of the base 1; and when four posts 3 are in the stowed position, an included angle between each of the four posts 3 and a diagonal line of the base 1 corresponding to a corresponding corner is an acute angle; or distances between each pair of adjacent posts 3 of the four posts 3 and the base 1 are different; or an included angle between each of the four posts 3 and a diagonal line of the base 1 corresponding to the corresponding corner is an acute angle; and distances between each pair of adjacent posts 3 of the four posts 3 and the base 1 are different.

As shown in FIGS. 1 to 14, the first assembly 41 includes a first mounting base 43, the first mounting base 43 being mounted on a post 3 corresponded with the first assembly 41; and the second assembly 42 includes: a second mounting base 44, located on a side of the first mounting base 43 close to the base 1 and mounted on a post stopper 2 corresponded with the second assembly 42; a handle portion 45, an end of the handle portion 45 is rotatably connected with the second mounting base 44, an other end of the handle portion 45 is configured to be inserted into or detached from the post stopper 2 corresponded with the second assembly 42, wherein the post stopper 2 corresponded with the second assembly 42 is provided with a clearance hole 25 for insertion of the other end of the handle portion 45; and a latching portion 46, an end of the latching portion 46 is connected with a position between two ends of the handle portion 45, and an other end of the latching portion 46 is latched to or detached from the first mounting base 43.

As shown in FIGS. 1 to 14, the first mounting base 43 includes a first mounting plate 431 and a latching plate 432 connected with each other, the first mounting plate 431 being disposed on a side of the post 3 corresponded with the first assembly 41 away from a center line of the base 1 and fixedly connected with the post 3 corresponded with the first assembly 41, and the latching plate 432 being disposed on a side of the first mounting plate 431 away from the post 3 corresponded with the first assembly 41, and a latching recess 433 into which the latching portion 46 is latched is provided on a side of the latching plate 432 away from the second mounting base 44.

As shown in FIGS. 1 to 14, the handle portion 45 includes a handle body 451 and a first connecting shaft 452 and a second connecting shaft 453 mounted on the handle body 451, the first connecting shaft 452 being located on a side of the second connecting shaft 453 close to the first mounting base 43, and the first connecting shaft 452 being hinged to the second mounting base 44; and the latching portion 46 includes a first rod body 461 and two second rod bodies 462 respectively located at two ends of the first rod body 461, and connected with the first rod body 461, an end of each of the two second rod bodies 462 away from the first rod body 461 being hinged to

the second connecting shaft 453.

As shown in FIGS. 1 to 14, the handle body 451 includes: a hinge portion 454, on which the first connecting shaft 452 and the second connecting shaft 453 being mounted, and the hinge portion 454 being provided with a first mounting hole and a second mounting hole respectively used for mounting the first connecting shaft 452 and the second connecting shaft 453; and an insertion portion 455, fixedly connected with the hinge portion 454 and including an operation plate body 456 and two insertion plate bodies 457 located on a side of the operation plate body 456 close to the post stopper 2 corresponded with the second assembly 42 and respectively connected with two ends of the operation plate body 456, wherein two clearance holes 25 are spaced apart on the post stopper 2 corresponded with the second assembly 42, and the two clearance holes 25 are disposed correspondingly with the two insertion plate bodies 457.

As shown in FIGS. 1 to 14, the second mounting base 44 includes a second mounting plate 441 and a handle connecting plate 442 connected with each other, the second mounting plate 441 being disposed on a side of the post stopper 2 corresponded with the second assembly 42 away from a center line of the base 1 and fixedly connected with the post stopper 2 corresponded with the second assembly 42, and the handle connecting plate 442 being disposed on a side of the second mounting plate 441 away from the post 3 corresponded with the first assembly 41, and the handle connecting plate 442 is provided with a connecting through hole for the first connecting shaft 452 to pass through.

In particular, when the post 3 is in the deployed position perpendicular to the base 1, the latching portion 46 of the quick clamp 4 is first pulled upward and rotated, so that the first rod body 461 is latched into the latching recess 433 of the latching plate 432. Then, the handle portion 45 is rotated, causing the two insertion plate bodies 457 of the insertion portion 455 to be inserted into the clearance holes 25, respectively, thereby positioning the quick clamp 4 in the locking position and locking the post 3 to the post stopper 2. When the post 3 needs to be switched to a folded position, the handle portion 45 of the quick clamp 4 is first rotated to withdraw the two insertion plate bodies 457 of the insertion portion 455 of the quick clamp 4 from the avoidance holes 25. Then, the latching portion 46 of the quick clamp 4 is pulled upward and rotated, causing the first rod body 461 to disengage from the latching recess 433, thereby positioning the quick clamp 4 in the unlocking position and allowing the post 3 to be rotated to the folded position.

As shown in FIGS. 1 to 14, each of the plurality of post stoppers 2 includes a first plate body 21, a second plate body 22, and a third plate body 23, the first plate body 21 and the second plate body 22 being disposed opposite to each other and being connected via the third plate body 23, and the

third plate body 23 being located on a side of the first plate body 21 and the second plate body 22 away from a center line of the base 1 to define, to enclose a receiving space for receiving an end of a corresponding post 3 of the plurality of posts 3 with the first plate body 21 and the second plate body 22, wherein a corresponding quick clamp 4 of the plurality of quick clamps 4 is mounted on a side of the third plate body 23 away from the receiving space.

As shown in FIGS. 1 to 14, at least one of the first plate body 21 and the second plate body 22 is provided with a strip guide hole 20 extending in a direction perpendicular to the base 1; each of the plurality of post stoppers 2 further includes a pin shaft 24 inserted through a corresponding strip guide hole 20 and fixedly connected with a post 3 corresponded with a post stopper 2, the pin shaft 24 being rotatable within the corresponding strip guide hole 20 and movably disposed in an extension direction of the corresponding strip guide hole 20, so that the post 3 corresponded with the post stopper 2 is moveably disposed relative to the post stopper 2 and a movement stroke of the post 3 corresponded with the post stopper 2 is limited.

As shown in FIGS. 1 to 14, the post 3 includes: a post body 30; a first limiting member 31, connected with the post body 30 and at least partially located between the post body 30 and the first plate body 21; a second limiting member 32, connected with the post body 30 and at least partially located between the post body 30 and the second plate body 22; and a third limiting member 33, connected with the post body 30 and at least partially located between the post body 30 and the third plate body 23. In this way, when each post 3 is in the deployed position, the wobbling between each post body 30 and the post stopper 2 can be reduced, thereby avoiding significant displacement between the upper end and lower end of each post body 30 in the vertical direction.

As shown in FIGS. 1 to 8, the post 3 further includes: a first fastener 34 and a first connecting plate 37, the first connecting plate 37 being located within the post body 30 and parallel to the first limiting member 31, wherein the first limiting member 31 is a flat plate located between the post body 30 and a post stopper 2 corresponded with a post 3, a threaded end of the first fastener 34 passing through the first limiting member 31 and a side of the post body 30 corresponded with the first connecting plate 37 and being threadedly connected with the first connecting plate 37, a cap end of the first fastener 34 being located on a side of the first limiting member 31 away from the post body 30, and the first plate body 21 being provided with a first clearance groove for avoiding the cap end of the first fastener 34; a second fastener 35 and a second connecting plate 38, the second connecting plate 38 being located within the post body 30 and parallel to the second limiting member 32, wherein the second limiting member 32 is a flat plate located between the post body 30 and the post stopper 2 corresponded with the post 3, a threaded end of the second fastener 35 passing through the second limiting member 32 and a side of the post body 30 corresponded with

the second connecting plate 38 and being threadedly connected with the second connecting plate 38, a cap end of the second fastener 35 being located on a side of the second limiting member 32 away from the post body 30, and the second plate body 22 being provided with a second clearance groove for avoiding the cap end of the second fastener 35; and a third fastener 36 and a third connecting plate 39, the third connecting plate 39 being located within the post body 30 and parallel to the third limiting member 33, wherein the third limiting member 33 is a flat plate located between the post body 30 and the post stopper 2 corresponded with the post 3, a threaded end of the third fastener 36 passing through the third limiting member 33 and a side of the post body 30 corresponded with the third connecting plate 39 and being threadedly connected with the third connecting plate 39, a cap end of the third fastener 36 being located on a side of the third limiting member 33 away from the post body 30, and the third plate body 23 being provided with a third clearance groove for avoiding the cap end of the third fastener 36.

As shown in FIGS. 9 to 11, the post 3 further includes: a first connecting plate 37, located within the post body 30 and parallel to the first limiting member 31, wherein the first limiting member 31 is a bolt, a threaded end of the first limiting member 31 passing through a side of the post body 30 corresponded with the first connecting plate 37 and being threadedly connected with the first connecting plate 37, and a cap end of the first limiting member 31 being located between the post body 30 and the first plate body 21; a second connecting plate 38, located within the post body 30 and parallel to the second limiting member 32, wherein the second limiting member 32 is a bolt, a threaded end of the second limiting member 32 passing through a side of the post body 30 corresponded with the second connecting plate 38 and being threadedly connected with the second connecting plate 38, and a cap end of the second limiting member 32 being located between the post body 30 and the second plate body 22; and a third connecting plate 39, located within the post body 30 and parallel to the third limiting member 33, wherein the third limiting member 33 is a bolt, a threaded end of the third limiting member 33 passing through a side of the post body 30 corresponded with the third connecting plate 39 and being threadedly connected with the third connecting plate 39, and a cap end of the third limiting member 33 being located between the post body 30 and the third plate body 23.

As shown in FIGS. 12 to 14, the first limiting member 31, the second limiting member 32, and the third limiting member 33 are all flat plates between the post body 30 and a post stopper 2 corresponded with a post 3; and the post body 30 includes a first post segment 301 and a second post segment 302 connected with each other, the first post segment 301 being located on a side of the second post segment 302 away from the base 1, and a distance between an outer peripheral surface of the first post segment 301 and the post stopper 2 corresponded with the post 3 being

greater than a distance between an outer peripheral surface of the second post segment 302 and the post stopper 2 corresponded with the post 3, wherein the first limiting member 31, the second limiting member 32, and the third limiting member 33 are welded to the first post segment 301.

In particular, the structure of the post body 30, which includes the first post segment 301 and the second post segment 302, is formed by processing a square tube using mechanical equipment.

As shown in FIGS. 4 and 7, the transportation device includes: a support, connected with the base 1; and a first discharge component 5, a second discharge component 6, and a third discharge component 7, which are spaced apart on the base 1 in a first direction parallel to the base 1, wherein the base 1 is made of plastic, and the support is made of metal, so as to solve the problem of discharging positions of turnover boxes being inconvenient to use in the art known to inventors.

As shown in FIG. 4, the first discharge component 5 and the third discharge component 7 are respectively located on opposite sides of the base 1, and the second discharge component 6 is located at a central part of the base 1.

As shown in FIG. 15, the base 1 is provided with: a first discharge groove 11, wherein the first discharge component 5 is mounted in the first discharge groove 11, an inlet of the first discharge groove 11 is located on a top surface of the base 1, and an outlet of the first discharge groove 11 is located on a first side surface of the base 1; a second discharge groove 12, wherein the second discharge component 6 is mounted in the second discharge groove 12, an inlet of the second discharge groove 12 is located on the top surface of the base 1, and an outlet of the second discharge groove 12 is located on a bottom surface of the base 1; and a third discharge groove 13, wherein the third discharge component 7 is mounted in the third discharge groove 13, an inlet of the third discharge groove 13 is located on the top surface of the base 1, and an outlet of the third discharge groove 13 is located on a second side surface of the base 1.

In particular, the first discharge component 5 includes a first discharge valve 51 which is mounted within the first discharge groove 11 to open or close the first discharge groove 11; the second discharge component 6 includes a second discharge valve 61 which is mounted within the second discharge groove 12 to open or close the second discharge groove 12; and the third discharge component 7 includes a third discharge valve 71 which is mounted within the third discharge groove 13 to open or close the third discharge groove 13.

The first discharge component 5, the second discharge component 6, and the third discharge component 7 are configured for connection with material bags of different specifications, respectively.

In particular, the first discharge component 5 can be configured to discharge liquid materials, and the third discharge component 7 can be configured to discharge pasty materials.

As shown in FIG. 15, the first discharge component 5 includes a first discharge valve 51 which is mounted within the first discharge groove 11 to open or close the first discharge groove 11; and the base 1 further includes a communication pipeline 8, and the base 1 is provided with a mounting groove 14 for mounting at least part of a communication pipeline 8, an inlet of the communication pipeline 8 being configured to connect to a discharge port of a liquid bag, and an outlet of the communication pipeline 8 being connected with an inlet of the first discharge valve 51.

It should be noted that the first discharge component 5, the second discharge component 6, the third discharge component 7, and the communication pipeline 8 can be selected according to the different materials actually carried. The base 1 does not necessarily have to have the first discharge component 5, the second discharge component 6, the third discharge component 7, and the communication pipeline 8 at the same time.

For example, when the first discharge component 5 and the communication pipeline 8 are installed on the base 1, it is necessary to remove the second discharge component 6 to avoid interference with the communication pipeline 8, so as to divert the material to the first discharge component 5 through the communication pipeline 8 for unloading from the first discharge component 5; When installing the second discharge component 6 on the base 1, it is necessary to remove the communication pipeline 8 to directly unload from the second discharge component 6.

As shown in FIGS. 1 to 4, the first discharge component 5 includes a base socket which is connected with an external power supply apparatus via an external wiring harness. The base socket is configured to connect to a heating pad socket of a heating pad to supply power to the heating pad.

In particular, the first discharge groove 11 has a variety of functions. The first discharge valve 51 and the base socket can be selectively disposed according to actual needs. When discharging is required at the first discharge groove 11, only the first discharge valve 51 is mounted within the first discharge groove 11. When a heating pad needs to be mounted, the first discharge valve 51 in the first discharge chute 11 can be removed, and the base socket is mounted within the first discharge groove 11.

As shown in FIG. 4, the third discharge component 7 includes a protective member 72 which is disposed within the third discharge groove 13 and located on a side of the third discharge valve 71 close to the inlet of the third discharge groove 13, to block the third discharge groove 13 when

discharge is not required.

As shown in FIG. 1, the support includes the plurality of post stoppers 2, and the support further includes: a plurality of first strip plates 101, disposed correspondingly with the plurality of post stoppers 2 and spaced apart around a center line of the base 1 to form a plurality of first intervals, wherein an end of each of the plurality of first strip plates 101 is connected with a corresponding post stopper 2 of the plurality of post stoppers 2, and an other end of each of the plurality of first strip plates 101 is disposed toward the center line of the base 1; a plurality of second strip plates 102, spaced apart around the center line of the base 1, wherein the plurality of second strip plates 102 are disposed in one-to-one correspondence within the plurality of first intervals, and two ends of each of the plurality of second strip plates 102 are respectively connected with two corresponding first strip plates 101 of the plurality of first strip plates 101; and wherein the base 1 is provided with a plurality of first strip grooves 15 for avoiding the plurality of first strip plates 101 in one-to-one correspondence and a plurality of second strip grooves 16 for avoiding the plurality of second strip plates 102 in one-to-one correspondence.

As shown in FIG. 1, the support includes: a central supporting leg 103, located at a central part of the base 1 and connected with the each of the plurality of first strip plates 101; and a plurality of peripheral supporting legs 104, spaced apart around the central supporting leg 103, wherein the plurality of peripheral supporting legs 104 are disposed correspondingly with the plurality of post stoppers 2, and each of the plurality of peripheral supporting legs 104 is located on a side of a corresponding post stopper 2 of the plurality of post stoppers 2 close to the supporting base surface and is connected with a post stopper 2 corresponded with a peripheral supporting leg 104.

As shown in FIG. 1, a central supporting platform 17 for contact with the central supporting leg 103, and a plurality of peripheral supporting platforms 18 for contact with the plurality of peripheral supporting legs 104 in one-to-one correspondence, are provided on a side of the base 1 close to the supporting base surface.

As shown in FIGS. 1 to 4, there are four peripheral supporting legs 104, which are grouped in pairs to form two peripheral supporting leg assemblies. The support includes two third strip plates 105 which are disposed in one-to-one correspondence with the two peripheral supporting leg assemblies. Two ends of each third strip plate 105 are connected with the two peripheral supporting legs 104 of the peripheral supporting leg assembly, respectively.

As shown in FIGS. 1 to 4, the base 1 is provided with two auxiliary supporting platforms 19 configured for mounting the first discharge component 5 and the third discharge component 7, respectively. The two third strip plates 105 are located on the sides of the two auxiliary supporting

platforms 19 close to the supporting base surface, respectively; and/or the support includes two auxiliary supporting legs 106 which are connected with the two third strip plates 105, respectively, each auxiliary supporting leg 106 being located on a side of the third strip plate 105 close to the supporting base surface.

In particular, the support includes two sets of supporting plates 107. The two sets of supporting plates 107 are disposed in one-to-one correspondence with the two auxiliary supporting legs 106 and the two third strip plates 105. Each set of supporting plates 107 is located on a side of the third strip plate 105 away from the center of the base 1 and is connected with the auxiliary supporting legs 106.

As shown in FIGS. 16 to 19, a third discharge groove 13 is provided on the base 1, and the transportation device includes: a base socket 73, detachably mounted within the third discharge groove 13 and being connected with an external power supply apparatus via an external wiring harness, to solve the problem of inconvenience of a turnover box in supplying power to a heating pad located within the turnover box in the art known to inventors.

In particular, the first discharge component 5 and the base socket 73 are switchably mounted within the third discharge groove 13.

As shown in FIGS. 20 to 26, the transportation device includes a heating pad 9 which is disposed on the base 1, the heating pad 9 including a heating pad body 90 and a heating pad plug 91 disposed on the heating pad body 90, the heating pad plug 91 being plug-connected with the base socket 73.

As shown in FIGS. 16 to 19, an inlet of the third discharge groove 13 is located on a top surface of the base 1, and an outlet of the third discharge groove 13 is located on a second side surface of the base 1; and the base 1 is provided with a fixing plate escape groove 110 which is configured for avoiding at least part of the heating pad plug 91, the fixing plate escape groove 110 being disposed at the inlet of the third discharge groove 13 and in communication with the third discharge groove 13.

As shown in FIGS. 16 to 19, the base socket 73 includes a socket housing 730 and a socket conductive component 735 mounted on the socket housing 730, a first end of the socket housing 730 being configured to receive insertion of a plug housing 931 of a plug portion 93 of the heating pad plug 91, a first end of the socket conductive component 735 being configured for electrical contact with a plug conductive component 932 of the plug portion 93, and a second end of the socket conductive component 735 being connected with the external power supply apparatus via

the external wiring harness.

As shown in FIGS. 16 to 19, the socket housing 730 includes: a socket connection portion 736, detachably connected with the base 1; a first socket portion 731, disposed on the socket connection portion 736 and located on a side of the socket connection portion 736 close to the outlet of the third discharge groove 13, to be connected with the external power supply apparatus via the external wiring harness; and a second socket portion 732, disposed on the socket connection portion 736 and located on a side of the socket connection portion 736 close to the inlet of the third discharge groove 13, for plug-in connection or disconnection with the heating pad plug 91.

As shown in FIGS. 16 to 19, the socket housing 730 further includes: a receiving cavity 733, disposed on the socket connection portion 736, the first socket portion 731 being located within the receiving cavity 733; and a protective cover 734, movably disposed on the socket connection portion 736 and located at an opening portion of the receiving cavity 733 to open or close the receiving cavity 733.

As shown in FIGS. 20 to 26, the heating pad plug 91 includes a connection portion 92 and a plug portion 93, the connection portion 92 being connected with the heating pad body 90, and the plug portion 93 being disposed on a side of the connection portion 92 and connected with the connection portion 92, for plug-in connection or disconnection with the base socket 73, wherein the connection portion 92 includes a first fixing plate 94 and a second fixing plate 95, the plug portion 93 being disposed on one of the first fixing plate 94 and the second fixing plate 95; and the first fixing plate 94 and the second fixing plate 95 are respectively located on opposite sides of the heating pad body 90, and the first fixing plate 94, the heating pad body 90, and the second fixing plate 95 are detachably connected via a plurality of first heating pad fasteners, to solve the problem of the complex structure of the heating pad used in a transportation box in the art known to inventors.

As shown in FIGS. 20 to 26, the first fixing plate 94 and the second fixing plate 95 are strip plate bodies extending in a predetermined direction; one of the first fixing plate 94 and the second fixing plate 95 is provided with a plurality of first through holes 941, and another of the first fixing plate 94 and the second fixing plate 95 is provided with a plurality of first threaded holes 951; the heating pad body 90 is provided with a plurality of second through holes 901; the plurality of first through holes 941, the plurality of first threaded holes 951, and the plurality of second through holes 901 are disposed correspondingly with the plurality of first heating pad fasteners; and a threaded end of each of the plurality of first heating pad fasteners passes through a corresponding first through hole 941 of the plurality of first through holes 941 and a corresponding second through hole 901 of the plurality of second through holes 901, and is then tightened into a corresponding first threaded hole

951 of the plurality of first threaded holes 951.

In particular, the first fixing plate 94 and the second fixing plate 95 each include a main plate body 903 which is integrally injection-molded, one of the first fixing plate 94 and the second fixing plate 95 includes a plurality of second heating pad fasteners 96 disposed on the main plate body 903, and the plurality of first threaded holes 951 are disposed in one-to-one correspondence on the plurality of the second heating pad fasteners 96.

As shown in FIGS. 20 to 26, the heating pad plug 91 is detachably mounted at a position to be mounted via a plurality of second heating pad fasteners 96; one of the first fixing plate 94 and the second fixing plate 95 is provided with a plurality of third through holes 942, and another of the first fixing plate 94 and the second fixing plate 95 is provided with a plurality of fourth through holes 952; the heating pad body 90 is provided with a plurality of fifth through holes 902; a plurality of second threaded holes 1101 are disposed at the position to be mounted; the plurality of third through holes 942, the plurality of fourth through holes 952, the plurality of fifth through holes 902, and the plurality of second threaded holes 1101 are disposed in one-to-one correspondence with the plurality of second heating pad fasteners 96; and a threaded end of each of the plurality of second heating pad fasteners 96 passes through a corresponding third through hole 942 of the plurality of third through holes 942, a corresponding fifth through hole 902 of the plurality of fifth through holes 902, and a corresponding fourth through hole 952 of the plurality of fourth through holes 952, and is then tightened into a corresponding second threaded hole 1101 of the plurality of second threaded holes 1101.

In particular, the first heating pad fastener is a bolt. The second fixing plate 95 is provided with a plurality of metal nuts, and the plurality of first threaded holes 951 are disposed in one-to-one correspondence on the plurality of metal nuts. A threaded end of each second heating pad fastener 96 is tightened into the first threaded hole 951 on the metal nut.

As shown in FIGS. 20 to 26, the plug portion 93 includes: a plug housing 931, integrally injection-molded with one of the first fixing plate 94 and the second fixing plate 95, wherein a side of the plug housing 931 away from the heating pad body 90 is configured to be in plug-in engagement with a socket housing 730 of the base socket 73; and a plug conductive component 932, a first end of which passes through the plug housing 931 and is electrically connected with the heating pad body 90, and a second end of which is located outside the plug housing 931 for electrical contact with a socket conductive component 735 of the base socket 73.

As shown in FIGS. 20 to 26, the transportation device includes a base assembly including the base 1, the heating pad 9, and the base socket 73, the base 1 being provided with: a fixing plate

escape groove 110, configured for avoiding one of the first fixing plate 94 and the second fixing plate 95, the fixing plate escape groove 110 being in communication with the third discharge groove 13.

As shown in FIGS. 20 to 26, the base socket 73 includes a socket housing 730 and a socket conductive component 735 mounted on the socket housing 730, a first end of the socket housing 730 being configured to receive insertion of a plug housing 931 of a plug portion 93 of the heating pad plug 91, a first end of the socket conductive component 735 being configured for electrical contact with a plug conductive component 932 of the plug portion 93, and a second end of the socket conductive component 735 being connected with the external power supply apparatus via the external wiring harness.

In particular, the second heating pad fastener 96 is a bolt. The heating pad plug 91 is detachably mounted on the base 1 via a plurality of second heating pad fasteners 96; a plurality of connecting nuts are disposed on a groove bottom surface of the fixing plate escape groove 110, the plurality of connecting nuts being disposed in one-to-one correspondence with the plurality of second heating pad fasteners 96; and a threaded end of each of the plurality of second heating pad fastener 96 passes through the heating pad plug 91 and is tightened into a second threaded hole 1101 on a corresponding connecting nut of the plurality of connecting nuts.

As shown in FIGS. 27 and 28, the transportation device further includes a material storage apparatus 10 which is disposed on the base 1 and at least partially located between the plurality of posts 3.

As shown in FIGS. 27 and 28, the material storage apparatus 10 includes a receiving bag 111 disposed above the base 1, the receiving bag 111 including a bag body 1111 and a plurality of sleeve tubes 1112 spaced apart around a peripheral side of the bag body 1111, wherein each of the plurality of sleeve tubes 1112 is connected with the bag body 1111, the bag body 1111 is located between the plurality of posts 3, and the plurality of sleeve tubes 1112 are sleeved in one-to-one correspondence on the plurality of posts 3.

As shown in FIGS. 27 and 28, the receiving bag 111 further includes a plurality of handles 1113 spaced apart around the peripheral side of the bag body 1111 and each of the plurality of handles 1113 is connected with an end of the bag body 1111 away from the base 1, to move the bag body 1111 via the plurality of handles 1113.

In particular, the receiving bag 111 can be sleeved in one-to-one correspondence on the plurality of posts 3 via the plurality of sleeve tubes 1112, and can also be removed from the plurality

of posts 3 by pulling the plurality of handles 1113.

In some embodiments, the bag body 1111 is a sealed bag body with an inlet/outlet connector, or an open bag body with a fully open upper portion.

As shown in FIGS. 27 and 28, the material storage apparatus 10 further includes a material storage barrel 112 having a material storage position for placement within the bag body 1111 and a remove position for removal from the bag body 1111.

In some embodiments, the operator can directly place the material within the receiving bag 111, or place the material storage barrel 112 within the receiving bag 111 and then place the material within the material storage barrel 112.

As shown in FIGS. 27 and 28, the receiving bag 111 is a cloth bag or a plastic bag, and the material storage barrel 112 is a plastic barrel. A material storage port is disposed at the top of the material storage barrel 112, and a discharge connector is disposed at the bottom of the material storage barrel 112. A clearance opening for avoiding the discharge connector is disposed at the bottom of the receiving bag 111. The discharge connector passes through the clearance opening and extends to the first discharge groove 11 for discharging.

From the description above, it can be seen that the embodiments described above of the present invention achieve the following technical effects.

The transportation device of the present invention is placed on a supporting base surface, the transportation device including: a base 1; a plurality of post stoppers 2, spaced apart on the base 1 along a circumferential direction of the base 1, wherein a first end of each of the plurality of post stoppers 2 passes through the base 1 and extends to a side of the base 1 close to the supporting base surface, and a second end of the each of the plurality of post stoppers 2 is located on a side of the base 1 away from the supporting base surface; a plurality of posts 3, mounted in one-to-one correspondence on the plurality of post stoppers 2, wherein each of the plurality of posts 3 is located on a side of the base 1 away from the supporting base surface, and the each of the plurality of posts 3 is movably disposed relative to a corresponding post stopper 2 of the plurality of post stoppers 2 to have a deployed position perpendicular to the base 1 and a stowed position parallel to the base 1; and a plurality of quick clamps 4, disposed in one-to-one correspondence with the plurality of post stoppers 2 and the plurality of posts 3, wherein each of the plurality of quick clamps 4 includes a first assembly 41 and a second assembly 42, the first assembly 41 is connected with a corresponding post 3 of the plurality of posts 3, and the second assembly 42 is connected with a corresponding post stopper 2 of the plurality of post stoppers 2, the first assembly 41 and the

second assembly 42 being configured to be connectable with or detachable from each other, such that each of the plurality of quick clamps 4 has a locking position for locking the deployed position of a post 3 corresponded with a quick clamp 4 and an unlocking position for releasing the post 3 corresponded with the quick clamp 4, thereby solve the problem of inconvenience in storing the posts of the turnover box in the art known to inventors.

It is to be noted that the terms used herein are for describing specific embodiments only and are not intended to limit the exemplary embodiments according to the present invention. As used herein, unless the context clearly indicates otherwise, the singular form is also intended to include the plural form. In addition, it is to be understood that when the terms “include” and/or “include” are used in this description, the terms indicate the presence of features, steps, operations, devices, assemblies, and/or combinations thereof.

Unless specifically stated otherwise, the relative disposition, numerical expressions, and values of components and steps described in these embodiments do not limit the scope of the present invention. Moreover, it is to be understood that for ease of description, the dimensions of the various parts depicted in the drawings are not drawn to scale. Techniques, methods, and devices known to those of ordinary skill in the relevant art can not be discussed in detail, but, where appropriate, the techniques, methods, and devices are to be regarded as part of the authorized description. In all examples shown and discussed herein, any specific values are to be interpreted as merely exemplary and not as limiting. Therefore, other examples of the exemplary embodiments can have different values. It is to be noted that similar reference numerals and letters indicate similar items in the following drawings. Therefore, once an item is defined in one drawing, further discussion thereof in subsequent drawings is unnecessary.

In the description of the present invention, it is to be understood that orientation or positional relationship indicated by orientation words such as “front, rear, upper, lower, left, right”, “lateral, vertical, perpendicular, horizontal”, “top, bottom”, and the like is generally on the basis of the orientation or positional relationship described in the drawings. These terms are merely for the purpose of facilitating the description of the present invention and simplifying the description. Unless otherwise expressly specified, these orientation words are not intended to indicate or imply that the apparatuses or members referred to must have a specific orientation or be constructed and operated in a specific orientation, and therefore are not to be construed as limiting the scope of protection of the present invention. The orientation words “inner” and “outer” refer to the inner and outer relative to the contour of each component.

For ease of description, spatially relative terms such as “over”, “above”, “on upper surface”,

“upper”, and the like is used herein to describe the spatial positional relationship between one device or feature and another device or feature as illustrated in the drawings. It is to be understood that spatially relative terms are intended to include different orientations of the device during use or operation in addition to the orientation depicted in the drawings. For example, if a device in the drawings is inverted, a device described as being “above” or “over” another device or structure is then positioned as “below” or “under” another device or structure. Accordingly, the exemplary term “above” can include two orientations “above” and “below”. The device can also be positioned in other different ways rotated 90 degrees or in other orientations, with explanations provided for the spatial relative descriptions used here.

In addition, it is to be noted that the use of words such as “first”, “second”, and the like to define components is merely for the purpose of facilitating the distinction between the components. Unless otherwise stated, the words above have no special meaning and thus cannot be construed as limiting the scope of protection of the present invention.

The embodiments described above are merely preferred embodiments of the present invention and are not intended to limit the present invention. Various modifications and variations can be made by those skilled in the art. Any modification, equivalent replacement, improvement, and the like made within the spirit and principle of the present invention shall be included in the scope of protection of the present invention.

Claims

1. A transportation device placed on a supporting base surface, the transportation device comprising:

a base (1);

a plurality of post stoppers (2), spaced apart on the base (1) along a circumferential direction of the base (1), wherein a first end of each of the plurality of post stoppers (2) passes through the base (1) and extends to a side of the base (1) close to the supporting base surface, and a second end of each of the plurality of post stoppers (2) is located on a side of the base (1) away from the supporting base surface;

a plurality of posts (3), mounted in one-to-one correspondence on the plurality of post stoppers (2), wherein each of the plurality of posts (3) is located on a side of the base (1) away from the supporting base surface, and each of the plurality of posts (3) is movably disposed relative to a corresponding post stopper (2) of the plurality of post stoppers (2) to have a deployed position perpendicular to the base (1) and a stowed position parallel to the base (1); and

a plurality of quick clamps (4), disposed in one-to-one correspondence with the plurality of post stoppers (2) and the plurality of posts (3), wherein each of the plurality of quick clamps (4) comprises a first assembly (41) and a second assembly (42), the first assembly (41) is connected with a corresponding post (3) of the plurality of posts (3), and the second assembly (42) is connected with a corresponding post stopper (2) of the plurality of post stoppers (2), the first assembly (41) and the second assembly (42) being configured to be connectable with or detachable from each other, such that each of the plurality of quick clamps (4) has a locking position for locking the deployed position of a post (3) corresponded with a quick clamp (4) and an unlocking position for releasing the post (3) corresponded with the quick clamp (4).

2. The transportation device according to claim 1, wherein the base (1) is a rectangular plate body, each of a number of the plurality of post stoppers (2), a number of the plurality of posts (3), and a number of the plurality of quick clamps (4) is four, and four post stoppers (2) are disposed in one-to-one correspondence at four corners of the base (1); and when four posts (3) are in the stowed position;

an included angle between each of the four posts (3) and a diagonal line of the base (1) corresponding to a corresponding corner is an acute angle; or

distances between each pair of adjacent posts (3) of the four posts (3) and the base (1) are different; or

an included angle between each of the four posts (3) and a diagonal line of the base (1) corresponding to the corresponding corner is an acute angle; and distances between each pair of adjacent posts (3) of the four posts (3) and the base (1) are different.

3. The transportation device according to claim 1, wherein the first assembly (41) comprises a first mounting base (43), the first mounting base (43) being mounted on a post (3) corresponded with the first assembly (41); and the second assembly (42) comprises:

a second mounting base (44), located on a side of the first mounting base (43) close to the base (1) and mounted on a post stopper (2) corresponded with the second assembly (42);

a handle portion (45), an end of the handle portion (45) is rotatably connected with the second mounting base (44), an other end of the handle portion (45) is configured to be inserted into or detached from the post stopper (2) corresponded with the second assembly (42), wherein the post stopper (2) corresponded with the second assembly (42) is provided with a clearance hole (25) for insertion of the other end of the handle portion (45); and

a latching portion (46), an end of the latching portion (46) is connected with a position between two ends of the handle portion (45), and an other end of the latching portion (46) is latched to or detached from the first mounting base (43).

4. The transportation device according to claim 3, wherein the first mounting base (43) comprises a first mounting plate (431) and a latching plate (432) connected with each other, the first mounting plate (431) being disposed on a side of the post (3) corresponded with the first assembly (41) away from a center line of the base (1) and fixedly connected with the post (3) corresponded with the first assembly (41), and the latching plate (432) being disposed on a side of the first mounting plate (431) away from the post (3) corresponded with the first assembly (41), and a latching recess (433) into which the latching portion (46) is latched is provided on a side of the latching plate (432) away from the second mounting base (44);

the handle portion (45) comprises a handle body (451) and a first connecting shaft (452) and a second connecting shaft (453) mounted on the handle body (451), the first connecting shaft (452) being located on a side of the second connecting shaft (453) close to the first mounting base (43), and the first connecting shaft (452) being hinged to the second mounting base (44); and

the latching portion (46) comprises a first rod body (461) and two second rod bodies (462) respectively located at two ends of the first rod body (461), and connected with the first rod body (461), an end of each of the two second rod bodies (462) away from the first rod body

(461) being hinged to the second connecting shaft (453).

5. The transportation device according to claim 4, wherein,

the handle body (451) comprises: a hinge portion (454), on which the first connecting shaft (452) and the second connecting shaft (453) being mounted, and the hinge portion (454) being provided with a first mounting hole and a second mounting hole respectively used for mounting the first connecting shaft (452) and the second connecting shaft (453); and an insertion portion (455), fixedly connected with the hinge portion (454) and comprising an operation plate body (456) and two insertion plate bodies (457) located on a side of the operation plate body (456) close to the post stopper (2) corresponded with the second assembly (42) and respectively connected with two ends of the operation plate body (456), wherein two clearance holes (25) are spaced apart on the post stopper (2) corresponded with the second assembly (42), and the two clearance holes (25) are disposed correspondingly with the two insertion plate bodies (457).

or

the second mounting base (44) comprises a second mounting plate (441) and a handle connecting plate (442) connected with each other, the second mounting plate (441) being disposed on a side of the post stopper (2) corresponded with the second assembly (42) away from a center line of the base (1) and fixedly connected with the post stopper (2) corresponded with the second assembly (42), and the handle connecting plate (442) being disposed on a side of the second mounting plate (441) away from the post (3) corresponded with the first assembly (41), and the handle connecting plate (442) is provided with a connecting through hole for the first connecting shaft (452) to pass through.

6. The transportation device according to claim 1, wherein each of the plurality of post stoppers (2) comprises a first plate body (21), a second plate body (22), and a third plate body (23), the first plate body (21) and the second plate body (22) being disposed opposite to each other and being connected via the third plate body (23), and the third plate body (23) being located on a side of the first plate body (21) and the second plate body (22) away from a center line of the base (1) to define, to enclose a receiving space for receiving an end of a corresponding post (3) of the plurality of posts (3) with the first plate body (21) and the second plate body (22), wherein a corresponding quick clamp (4) of the plurality of quick clamps (4) is mounted on a side of the third plate body (23) away from the receiving space; at least one of the first plate body (21) and the second plate body (22) is provided with a strip guide hole (20) extending in a direction perpendicular to the base (1); each of the plurality of post stoppers (2) further comprises a pin shaft (24) inserted through a corresponding

strip guide hole (20) and fixedly connected with a post (3) corresponded with a post stopper (2), the pin shaft (24) being rotatable within the corresponding strip guide hole (20) and movably disposed in an extension direction of the corresponding strip guide hole (20), so that the post (3) corresponded with the post stopper (2) is moveably disposed relative to the post stopper (2) and a movement stroke of the post (3) corresponded with the post stopper (2) is limited; and

the post (3) comprises: a post body (30); a first limiting member (31), connected with the post body (30) and at least partially located between the post body (30) and the first plate body (21); a second limiting member (32), connected with the post body (30) and at least partially located between the post body (30) and the second plate body (22); and a third limiting member (33), connected with the post body (30) and at least partially located between the post body (30) and the third plate body (23).

7. The transportation device according to claim 6, wherein,

the post (3) further comprises: a first fastener (34) and a first connecting plate (37), the first connecting plate (37) being located within the post body (30) and parallel to the first limiting member (31), wherein the first limiting member (31) is a flat plate located between the post body (30) and a post stopper (2) corresponded with the post (3), a threaded end of the first fastener (34) passing through the first limiting member (31) and a side of the post body (30) corresponded with the first connecting plate (37) and being threadedly connected with the first connecting plate (37), a cap end of the first fastener (34) being located on a side of the first limiting member (31) away from the post body (30), and the first plate body (21) being provided with a first clearance groove for avoiding the cap end of the first fastener (34); a second fastener (35) and a second connecting plate (38), the second connecting plate (38) being located within the post body (30) and parallel to the second limiting member (32), wherein the second limiting member (32) is a flat plate located between the post body (30) and the post stopper (2) corresponded with the post (3), a threaded end of the second fastener (35) passing through the second limiting member (32) and a side of the post body (30) corresponded with the second connecting plate (38) and being threadedly connected with the second connecting plate (38), a cap end of the second fastener (35) being located on a side of the second limiting member (32) away from the post body (30), and the second plate body (22) being provided with a second clearance groove for avoiding the cap end of the second fastener (35); and a third fastener (36) and a third connecting plate (39), the third connecting plate (39) being located within the post body (30) and parallel to the third limiting member (33), wherein the third limiting member (33) is a flat plate located between the post body (30) and the post stopper (2)

corresponded with the post (3), a threaded end of the third fastener (36) passing through the third limiting member (33) and a side of the post body (30) corresponded with the third connecting plate (39) and being threadedly connected with the third connecting plate (39), a cap end of the third fastener (36) being located on a side of the third limiting member (33) away from the post body (30), and the third plate body (23) being provided with a third clearance groove for avoiding the cap end of the third fastener (36); or

the post (3) further comprises: a first connecting plate (37), located within the post body (30) and parallel to the first limiting member (31), wherein the first limiting member (31) is a bolt, a threaded end of the first limiting member (31) passing through a side of the post body (30) corresponded with the first connecting plate (37) and being threadedly connected with the first connecting plate (37), and a cap end of the first limiting member (31) being located between the post body (30) and the first plate body (21); a second connecting plate (38), located within the post body (30) and parallel to the second limiting member (32), wherein the second limiting member (32) is a bolt, a threaded end of the second limiting member (32) passing through a side of the post body (30) corresponded with the second connecting plate (38) and being threadedly connected with the second connecting plate (38), and a cap end of the second limiting member (32) being located between the post body (30) and the second plate body (22); and a third connecting plate (39), located within the post body (30) and parallel to the third limiting member (33), wherein the third limiting member (33) is a bolt, a threaded end of the third limiting member (33) passing through a side of the post body (30) corresponded with the third connecting plate (39) and being threadedly connected with the third connecting plate (39), and a cap end of the third limiting member (33) being located between the post body (30) and the third plate body (23); or

the first limiting member (31), the second limiting member (32), and the third limiting member (33) are all flat plates between the post body (30) and a post stopper (2) corresponded with a post (3); and the post body (30) comprises a first post segment (301) and a second post segment (302) connected with each other, the first post segment (301) being located on a side of the second post segment (302) away from the base (1), and a distance between an outer peripheral surface of the first post segment (301) and the post stopper (2) corresponded with the post (3) being greater than a distance between an outer peripheral surface of the second post segment (302) and the post stopper (2) corresponded with the post (3), wherein the first limiting member (31), the second limiting member (32), and the third limiting member (33) are welded to the first post segment (301).

8. The transportation device according to claim 1, wherein, comprising:

a support, connected with the base (1); and

a first discharge component (5), a second discharge component (6), and a third discharge component (7), which are spaced apart on the base (1) in a first direction parallel to the base (1);

wherein the base (1) is made of plastic, and the support is made of metal.

9. The transportation device according to claim 8, wherein the first discharge component (5) and the third discharge component (7) are respectively located on opposite sides of the base (1), and the second discharge component (6) is located at a central part of the base (1); the base (1) is provided with:

a first discharge groove (11), wherein the first discharge component (5) is mounted in the first discharge groove (11), an inlet of the first discharge groove (11) is located on a top surface of the base (1), and an outlet of the first discharge groove (11) is located on a first side surface of the base (1);

a second discharge groove (12), wherein the second discharge component (6) is mounted in the second discharge groove (12), an inlet of the second discharge groove (12) is located on the top surface of the base (1), and an outlet of the second discharge groove (12) is located on a bottom surface of the base (1); and

a third discharge groove (13), wherein the third discharge component (7) is mounted in the third discharge groove (13), an inlet of the third discharge groove (13) is located on the top surface of the base (1), and an outlet of the third discharge groove (13) is located on a second side surface of the base (1).

10. The transportation device according to claim 9, wherein,

the first discharge component (5) comprises a first discharge valve (51) which is mounted within the first discharge groove (11) to open or close the first discharge groove (11);

the second discharge component (6) comprises a second discharge valve (61) which is mounted within the second discharge groove (12) to open or close the second discharge groove (12);

the third discharge component (7) comprises a third discharge valve (71) which is mounted within the third discharge groove (13) to open or close the third discharge groove (13); and

the third discharge component (7) comprises a protective member (72) which is disposed within the third discharge groove (13) and located on a side of the third discharge valve (71) close to

the inlet of the third discharge groove (13), to block the third discharge groove (13) when discharge is not required.

11. The transportation device according to claim 9, wherein,

the first discharge component (5) comprises a first discharge valve (51) which is mounted within the first discharge groove (11) to open or close the first discharge groove (11); and

the base (1) further comprises a communication pipeline (8), and the base (1) is provided with a mounting groove (14) for mounting at least part of a communication pipeline (8), an inlet of the communication pipeline (8) being configured to connect to a discharge port of a liquid bag, and an outlet of the communication pipeline (8) being connected with an inlet of the first discharge valve (51).

12. The transportation device according to claim 11, wherein the support comprises the plurality of post stoppers (2), and the support further comprises:

a plurality of first strip plates (101), disposed correspondingly with the plurality of post stoppers (2) and spaced apart around a center line of the base (1) to form a plurality of first intervals, wherein an end of each of the plurality of first strip plates (101) is connected with a corresponding post stopper (2) of the plurality of post stoppers (2), and an other end of each of the plurality of first strip plates (101) is disposed toward the center line of the base (1);

a plurality of second strip plates (102), spaced apart around the center line of the base (1), wherein the plurality of second strip plates (102) are disposed in one-to-one correspondence within the plurality of first intervals, and two ends of each of the plurality of second strip plates (102) are respectively connected with two corresponding first strip plates (101) of the plurality of first strip plates (101); and

wherein the base (1) is provided with a plurality of first strip grooves (15) for avoiding the plurality of first strip plates (101) in one-to-one correspondence and a plurality of second strip grooves (16) for avoiding the plurality of second strip plates (102) in one-to-one correspondence.

13. The transportation device according to claim 12, wherein the support comprises:

a central supporting leg (103), located at a central part of the base (1) and connected with the each of the plurality of first strip plates (101); and

a plurality of peripheral supporting legs (104), spaced apart around the central supporting leg (103), wherein the plurality of peripheral supporting legs (104) are disposed correspondingly

with the plurality of post stoppers (2), and each of the plurality of peripheral supporting legs (104) is located on a side of a corresponding post stopper (2) of the plurality of post stoppers (2) close to the supporting base surface and is connected with a post stopper (2) corresponded with a peripheral supporting leg (104); and

a central supporting platform (17) for contact with the central supporting leg (103), and a plurality of peripheral supporting platforms (18) for contact with the plurality of peripheral supporting legs (104) in one-to-one correspondence, are provided on a side of the base (1) close to the supporting base surface.

14. The transportation device according to claim 1, wherein a third discharge groove (13) is provided on the base (1), and the transportation device comprises:

a base socket (73), detachably mounted within the third discharge groove (13) and being connected with an external power supply apparatus via an external wiring harness;

the transportation device comprises a heating pad (9) which is disposed on the base (1), the heating pad (9) comprising a heating pad body (90) and a heating pad plug (91) disposed on the heating pad body (90), the heating pad plug (91) being plug-connected with the base socket (73); and

an inlet of the third discharge groove (13) is located on a top surface of the base (1), and an outlet of the third discharge groove (13) is located on a second side surface of the base (1); and the base (1) is provided with a fixing plate escape groove (110) which is configured for avoiding at least part of the heating pad plug (91), the fixing plate escape groove (110) being disposed at the inlet of the third discharge groove (13) and in communication with the third discharge groove (13).

15. The transportation device according to claim 14, wherein the base socket (73) comprises a socket housing (730) and a socket conductive component (735) mounted on the socket housing (730), a first end of the socket housing (730) being configured to receive insertion of a plug housing (931) of a plug portion (93) of the heating pad plug (91), a first end of the socket conductive component (735) being configured for electrical contact with a plug conductive component (932) of the plug portion (93), and a second end of the socket conductive component (735) being connected with the external power supply apparatus via the external wiring harness.

16. The transportation device according to claim 15, wherein the socket housing (730) comprises:

a socket connection portion (736), detachably connected with the base (1);

a first socket portion (731), disposed on the socket connection portion (736) and located on a side of the socket connection portion (736) close to the outlet of the third discharge groove (13), to be connected with the external power supply apparatus via the external wiring harness;

a second socket portion (732), disposed on the socket connection portion (736) and located on a side of the socket connection portion (736) close to the inlet of the third discharge groove (13), for plug-in connection or disconnection with the heating pad plug (91);

a receiving cavity (733), disposed on the socket connection portion (736), the first socket portion (731) being located within the receiving cavity (733); and

a protective cover (734), movably disposed on the socket connection portion (736) and located at an opening portion of the receiving cavity (733) to open or close the receiving cavity (733).

17. The transportation device according to claim 14, wherein

the heating pad plug (91) comprises a connection portion (92) and a plug portion (93), the connection portion (92) being connected with the heating pad body (90), and the plug portion (93) being disposed on a side of the connection portion (92) and connected with the connection portion (92), for plug-in connection or disconnection with the base socket (73);

wherein the connection portion (92) comprises a first fixing plate (94) and a second fixing plate (95), the plug portion (93) being disposed on one of the first fixing plate (94) and the second fixing plate (95); and the first fixing plate (94) and the second fixing plate (95) are respectively located on opposite sides of the heating pad body (90), and the first fixing plate (94), the heating pad body (90), and the second fixing plate (95) are detachably connected via a plurality of first heating pad fasteners.

18. The transportation device according to claim 17, wherein,

the plug portion (93) comprises: a plug housing (931), integrally injection-molded with one of the first fixing plate (94) and the second fixing plate (95), wherein a side of the plug housing (931) away from the heating pad body (90) is configured to be in plug-in engagement with a socket housing (730) of the base socket (73); and a plug conductive component (932), a first end of which passes through the plug housing (931) and is electrically connected with the heating pad body (90), and a second end of which is located outside the plug housing (931) for electrical contact with a socket conductive component (735) of the base socket (73); or

the transportation device comprises a base assembly comprising the base (1), the heating pad (9), and the base socket (73), configured for avoiding one of the first fixing plate (94) and the second fixing plate (95); and the heating pad plug (91) is detachably mounted on the base (1)

via a plurality of second heating pad fasteners (96); a plurality of connecting nuts are disposed on a groove bottom surface of the fixing plate escape groove (110), the plurality of connecting nuts being disposed in one-to-one correspondence with the plurality of second heating pad fasteners (96); and a threaded end of each of the plurality of second heating pad fastener (96) passes through the heating pad plug (91) and is tightened into a second threaded hole (1101) on a corresponding connecting nut of the plurality of connecting nuts.

19. The transportation device according to claim 1, further comprising a material storage apparatus (10) which is disposed on the base (1) and at least partially located between the plurality of posts (3).

20. The transportation device according to claim 19, wherein the material storage apparatus (10) comprises a receiving bag (111) disposed above the base (1), the receiving bag (111) comprising a bag body (1111) and a plurality of sleeve tubes (1112) spaced apart around a peripheral side of the bag body (1111), wherein each of the plurality of sleeve tubes (1112) is connected with the bag body (1111), the bag body (1111) is located between the plurality of posts (3), and the plurality of sleeve tubes (1112) are sleeved in one-to-one correspondence on the plurality of posts (3); wherein,

the receiving bag (111) further comprises a plurality of handles (1113) spaced apart around the peripheral side of the bag body (1111) and each of the plurality of handles (1113) is connected with an end of the bag body (1111) away from the base (1), to move the bag body (1111) via the plurality of handles (1113); or

the material storage apparatus (10) further comprises a material storage barrel (112) having a material storage position for placement within the bag body (1111) and a remove position for removal from the bag body (1111).