A positioning rack includes a main frame, and a plurality of blade plates. The main frame includes a base and a plurality of support arms. Each of the blade plates is formed with at least one guide slot having an end formed with a locking groove. Each of the support arms has at least one locking member having a locking post detachably inserted into the locking groove, and a catch block formed on a distal end of the locking post and rested on a surface of a respective blade plate. Thus, each of the blade plates is removed from the respective support arm easily and conveniently without needing aid of a tool, thereby facilitating the user replacing the blade plates.
FIG. 3
PRIOR ART
POSITIONING RACK FOR THIN-TYPE ELECTROTHERMAL STRAPS

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates to a positioning rack, and more particularly to a positioning rack for mounting thin-type electrothermal straps for an electric appliance, such as a cooling fan or the like.

[0003] 2. Description of the Related Art

[0004] A conventional positioning rack for mounting electrothermal straps 3 in accordance with the prior art shown in FIGS. 1-3 comprises a fixing bracket 1 having a base 102 and a plurality of support arms 104 mounted on the base 102, and a plurality of insulating members 2 each mounted on a respective one of the support arms 104 of the fixing bracket 1 and each having a side formed with a plurality of separation portions 204 and a plurality of positioning recesses 202 located between the separation portions 204 for positioning a plurality of electrothermal straps 3 for an electric appliance, such as a cooling fan or the like.

[0005] However, each of the insulating members 2 is fixed on a respective one of the support arms 104 of the fixing bracket 1 by a plurality of rivets with manual aid of a special tool, so that the tool easily touches and collides the insulating members 2 during the riveting process, thereby easily wearing or breaking the insulating members 2. In addition, the insulating members 2 are fixed by the support arms 104 of the fixing bracket 1, so that when either one of the insulating members 2 is worn out or broken, it is necessary to replace the whole positioning rack, thereby wasting the resource, and thereby increasing the costs.

SUMMARY OF THE INVENTION

[0006] The present invention is to mitigate and/or obviate the disadvantage of the conventional positioning rack for electrothermal straps.

[0007] The primary objective of the present invention is to provide a positioning rack for mounting thin-type electrothermal straps for an electric appliance, such as a cooling fan or the like.

[0008] Another objective of the present invention is to provide a positioning rack, wherein each of the blade plates is mounted on the respective support arm of the main frame easily and conveniently without needing aid of a tool, thereby facilitating the user mounting the blade plates, and thereby preventing the blade plates from being worn or broken due to hit of the tool.

[0009] A further objective of the present invention is to provide a positioning rack, wherein each of the blade plates is detached and removed from the respective support arm of the main frame easily and conveniently without needing aid of the tool, thereby facilitating the user replacing the blade plates.

[0010] In accordance with one embodiment of the present invention, there is provided a positioning rack, comprising a main frame, and a plurality of blade plates, wherein:

[0011] the main frame includes a base and a plurality of support arms mounted on the base;

[0012] each of the blade plates is detachably mounted on a respective one of the support arms of the main frame;

[0013] each of the blade plates is formed with at least one guide slot having an end formed with a locking groove;

[0014] each of the support arms of the main frame has a side formed with at least one protruding locking member detachably mounted on a respective one of the blade plates;

[0015] the locking member of each of the support arms of the main frame includes a locking post extended through the guide slot and detachably inserted into the locking groove of a respective one of the blade plates, and a catch block formed on a distal end of the locking post and rested on a surface of a respective one of the blade plates.

[0016] In accordance with another embodiment of the present invention, there is provided a positioning rack, comprising a first main frame, a plurality of blade plates each mounted on the first main frame, a second main frame, a plurality of second blade plates each mounted on the second main frame, and a separation tube mounted between the first main frame and the second main frame, wherein:

[0017] each of the first main frame and second main frame includes a base and a plurality of support arms mounted on the base;

[0018] each of the first blade plates and second blade plates is detachably mounted on a respective one of the support arms of the first main frame and second main frame respectively;

[0019] each of the first blade plates and second blade plates is formed with at least one guide slot having an end formed with a locking groove;

[0020] each of the support arms of each of the first main frame and second main frame has a side formed with at least one protruding locking member including a locking post extended through the guide slot and detachably inserted into the locking groove of a respective one of the first blade plates and second blade plates, and a catch block formed on a distal end of the locking post and rested on a surface of a respective one of the first blade plates and second blade plates.

[0021] Further benefits and advantages of the present invention will become apparent after a careful reading of the detailed description with appropriate reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0022] FIG. 1 is a partially perspective view of a fixing bracket of a conventional positioning rack in accordance with the prior art;

[0023] FIG. 2 is a plan view of an insulating member of the conventional positioning rack in accordance with the prior art;

[0024] FIG. 3 is a plan view of the conventional positioning rack in accordance with the prior art;
FIG. 4 is a partially exploded perspective view of a positioning rack in accordance with the preferred embodiment of the present invention;

FIG. 5 is a plan cross-sectional view of a locking member of the positioning rack in accordance with the preferred embodiment of the present invention;

FIG. 6 is a plan view of a blade plate of the positioning rack in accordance with the preferred embodiment of the present invention;

FIG. 7 is a partially exploded perspective view of a positioning rack in accordance with another embodiment of the present invention; and

FIG. 8 is a partially cut-away plan cross-sectional assembly view of the positioning rack as shown in FIG. 7.

DETAILED DESCRIPTION OF THE INVENTION

Referring to the drawings and initially to FIGS. 4-6, a positioning rack in accordance with the preferred embodiment of the present invention comprises a main frame 10, and a plurality of blade plates 20.

The main frame 10 includes a circular base 12 and a plurality of support arms 14 mounted on the base 12 and extended radially outward.

Each of the blade plates 20 is made of a heat resistant insulating material, such as a mica or the like, and is detachably mounted on a respective one of the support arms 14 of the main frame 10. Each of the blade plates 20 has two sides each formed with a plurality of hook-shaped separation portions 24 and a plurality of positioning recesses 22 located between the separation portions 24 for positioning a plurality of electrothermal straps (not shown) for an electric appliance, such as a cooking fan or the like.

Each of the blade plates 20 is formed with at least one guide slot 26 having an end formed with a locking groove 28 communicating with the guide slot 26. The guide slot 26 of each of the blade plates 20 has a width smaller than that of the locking groove 28. The guide slot 26 is extended in a longitudinal direction of each of the blade plates 20. In addition, the locking groove 28 is extended in a longitudinal direction of each of the blade plates 20.

Each of the support arms 14 of the main frame 10 has a side formed with at least one protruding locking member 16 detachably mounted on a respective one of the blade plates 20. The locking member 16 of each of the support arms 14 of the main frame 10 includes a locking post 162 extended through the guide slot 26 and detachably inserted into the locking groove 28 of a respective one of the blade plates 20, and a catch block 164 formed on a distal end of the locking post 162 and rested on a surface of a respective one of the blade plates 20. The catch block 164 of the locking member 16 is extended through the guide slot 26 of a respective one of the blade plates 20. The catch block 164 of the locking member 16 has a width greater than that of the locking post 162 and slightly smaller than that of the respective guide slot 26. In addition, the catch block 164 of the locking member 16 is vertical to a longitudinal direction of each of the support arms 14 of the main frame 10.

In assembly, each of the blade plates 20 is mounted on a respective one of the support arms 14 of the main frame 10, with the catch block 164 of the locking member 16 being extended through the guide slot 26 of a respective one of the blade plates 20. Then, each of the blade plates 20 is moved relative to the respective support arm 14 of the main frame 10, so that the locking post 162 of the locking member 16 is inserted into and locked in the locking groove 28 of the respective blade plate 20, so that each of the blade plates 20 is combined with and fixed on the respective support arm 14 of the main frame 10. Then, the electrothermal straps are wound around each of the blade plates 20 and positioned in the positioning recesses 22.

Alternatively, in replacement of the blade plates 20, each of the blade plates 20 is moved outward relative to the respective support arm 14 of the main frame 10, so that the locking post 162 of the locking member 16 is detached from the locking groove 28 of the respective blade plate 20 and is moved into the guide slot 26. Then, the catch block 164 of the locking member 16 is detached from the guide slot 26 of a respective one of the blade plates 20, so that each of the blade plates 20 is detached and removed from the respective support arm 14 of the main frame 10.

Accordingly, each of the blade plates 20 is mounted on the respective support arm 14 of the main frame 10 easily and conveniently without needing aid of a tool, thereby facilitating the user mounting the blade plates 20, and thereby preventing the blade plates 20 from being worn or broken due to hit of the tool. In addition, each of the blade plates 20 is detached and removed from the respective support arm 14 of the main frame 10 easily and conveniently without needing aid of the tool, thereby facilitating the user replacing the blade plates 20.

Referring to FIGS. 7 and 8, a positioning rack in accordance with another embodiment of the present invention comprises a first main frame 10′, a plurality of first blade plates 20′ each mounted on the first main frame 10′, a second main frame 10″, a plurality of second blade plates 20″ each mounted on the second main frame 10″, and a separation tube 40′ mounted between the first main frame 10′ and the second main frame 10″.

The first main frame 10′ includes a circular base 12 and a plurality of support arms 14′ mounted on the base 12 and extended radially outward. Each of the first blade plates 20′ is detachably mounted on a respective one of the support arms 14′ of the first main frame 10′.

The second main frame 10″ includes a circular base 12″ and a plurality of support arms 14″ mounted on the base 12″ and extended radially outward. Each of the second blade plates 20″ is detachably mounted on a respective one of the support arms 14″ of the second main frame 10″.

The base 12′ of the first main frame 10′ is formed with a shaft hole 122′ and has a first end formed with a first shaft tube 124′ and a second end formed with a tapered second shaft tube 126′. The shaft hole 122′ of the base 12″ of the second main frame 10″ is formed with a catch wall 128 located between the first shaft tube 124′ and the second shaft tube 126′.

The base 12″ of the second main frame 10″ is formed with a shaft hole 122″ and has a first end formed with a first shaft tube 124″ and a second end formed with a tapered second shaft tube 126″. The shaft hole 122″ of the
base 12" of the second main frame 10" is formed with a catch wall 128" located between the first shaft tube 124" and the second shaft tube 126".

[0043] The separation tube 40" has a first end mounted in the first shaft tube 124" of the first main frame 10" and a second end mounted on the second shaft tube 126" of the second main frame 10".

[0044] The positioning rack further comprises a shaft 30" extended through the shaft hole 122" of the base 12" of the first main frame 10", the separation tube 40" and the shaft hole 122" of the base 12" of the second main frame 10" to combine the first main frame 10", the separation tube 40" and the second main frame 10". The shaft 30" has a first end formed with a shaft head 32" mounted in the second shaft tube 126" of the first main frame 10" and rested on the catch wall 128" of the first main frame 10" and a second end formed with an outer thread 34" extended outward from the second main frame 10", and the positioning rack further comprises a nut 36" screwed on the outer thread 34" of the shaft 30". The nut 36" is mounted in the first shaft tube 124" of the second main frame 10" and rested on the catch wall 128" of the second main frame 10".

[0045] Although the invention has been explained in relation to its preferred embodiment(s) as mentioned above, it is to be understood that many other possible modifications and variations can be made without departing from the scope of the present invention. It is, therefore, contemplated that the appended claims will cover such modifications and variations that fall within the true scope of the invention.

What is claimed is:

1. A positioning rack, comprising a main frame, and a plurality of blade plates, wherein:
   - the main frame includes a base and a plurality of support arms mounted on the base;
   - each of the blade plates is detachably mounted on a respective one of the support arms of the main frame;
   - each of the blade plates is formed with at least one guide slot having an end formed with a locking groove;
   - each of the support arms of the main frame has a side formed with at least one protruding locking member detachably mounted on a respective one of the blade plates;
   - the locking member of each of the support arms of the main frame includes a locking post extended through the guide slot and detachably inserted into the locking groove of a respective one of the blade plates, and a catch block formed on a distal end of the locking post and rested on a surface of a respective one of the blade plates.

2. The positioning rack in accordance with claim 1, wherein each of the blade plates has two sides each formed with a plurality of hook-shaped separation portions and a plurality of positioning recesses located between the separation portions.

3. The positioning rack in accordance with claim 1, wherein the locking groove of each of the blade plates communicates with the guide slot.

4. The positioning rack in accordance with claim 1, wherein the guide slot of each of the blade plates has a width smaller than that of the locking groove.

5. The positioning rack in accordance with claim 1, wherein the guide slot is extended in a longitudinal direction of each of the blade plates.

6. The positioning rack in accordance with claim 1, wherein the locking groove is extended in a longitudinal direction of each of the blade plates.

7. The positioning rack in accordance with claim 1, wherein the catch block of the locking member is extended through the guide slot of a respective one of the blade plates.

8. The positioning rack in accordance with claim 1, wherein the catch block of the locking member has a width greater than that of the locking post and smaller than that of the respective guide slot.

9. The positioning rack in accordance with claim 1, wherein the catch block of the locking member is vertical to a longitudinal direction of each of the support arms of the main frame.

10. A positioning rack, comprising a first main frame, a plurality of first blade plates each mounted on the first main frame, a second main frame, a plurality of second blade plates each mounted on the second main frame, and a separation tube mounted between the first main frame and the second main frame, wherein:
   - each of the first main frame and second main frame includes a base and a plurality of support arms mounted on the base;
   - each of the first blade plates and second blade plates is detachably mounted on a respective one of the support arms of the first main frame and second main frame respectively;
   - each of the first blade plates and second blade plates is formed with at least one guide slot having an end formed with a locking groove;
   - each of the support arms of each of the first main frame and second main frame has a side formed with at least one protruding locking member including a locking post extended through the guide slot and detachably inserted into the locking groove of a respective one of the first blade plates and second blade plates, and a catch block formed on a distal end of the locking post and rested on a surface of a respective one of the first blade plates and second blade plates.

11. The positioning rack in accordance with claim 10, wherein the base of each of the first main frame and second main frame is formed with a shaft hole and has a first end formed with a first shaft tube and a second end formed with a tapered second shaft tube, and the separation tube has a first end mounted in the first shaft tube of the first main frame and a second end mounted on the second shaft tube of the second main frame.

12. The positioning rack in accordance with claim 11, further comprising a shaft extended through the shaft hole of the base of the first main frame, the separation tube and the shaft hole of the base of the second main frame to combine the first main frame, the separation tube and the second main frame.

13. The positioning rack in accordance with claim 12, wherein the shaft hole of the base of each of the first main frame and second main frame is formed with a catch wall located between the first shaft tube and the second shaft tube, the shaft has a first end formed with a shaft head mounted in the second shaft tube of the first main frame and
rested on the catch wall of the first main frame and a second end formed with an outer thread extended outward from the second main frame, and the positioning rack further comprises a nut screwed on the outer thread of the shaft.

14. The positioning rack in accordance with claim 13, wherein the nut is mounted in the first shaft tube of the second main frame and rested on the catch wall of the second main frame.

15. The positioning rack in accordance with claim 10, wherein each of the first blade plates and second blade plates has two sides each formed with a plurality of hook-shaped separation portions and a plurality of positioning recesses located between the separation portions.

16. The positioning rack in accordance with claim 10, wherein the catch block of the locking member has a width greater than that of the locking post and smaller than that of the respective guide slot.

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