



US 20070221591A1

(19) **United States**

(12) **Patent Application Publication**
Hsu

(10) **Pub. No.: US 2007/0221591 A1**

(43) **Pub. Date: Sep. 27, 2007**

(54) **WEDGED SLIDING TROUGH STRUCTURE**

(52) **U.S. Cl. 211/41.12**

(76) Inventor: **Yang-Yuan Hsu, Taipei Hsien (TW)**

(57) **ABSTRACT**

Correspondence Address:

ROSENBERG, KLEIN & LEE
3458 ELLICOTT CENTER DRIVE-SUITE 101
ELLICOTT CITY, MD 21043 (US)

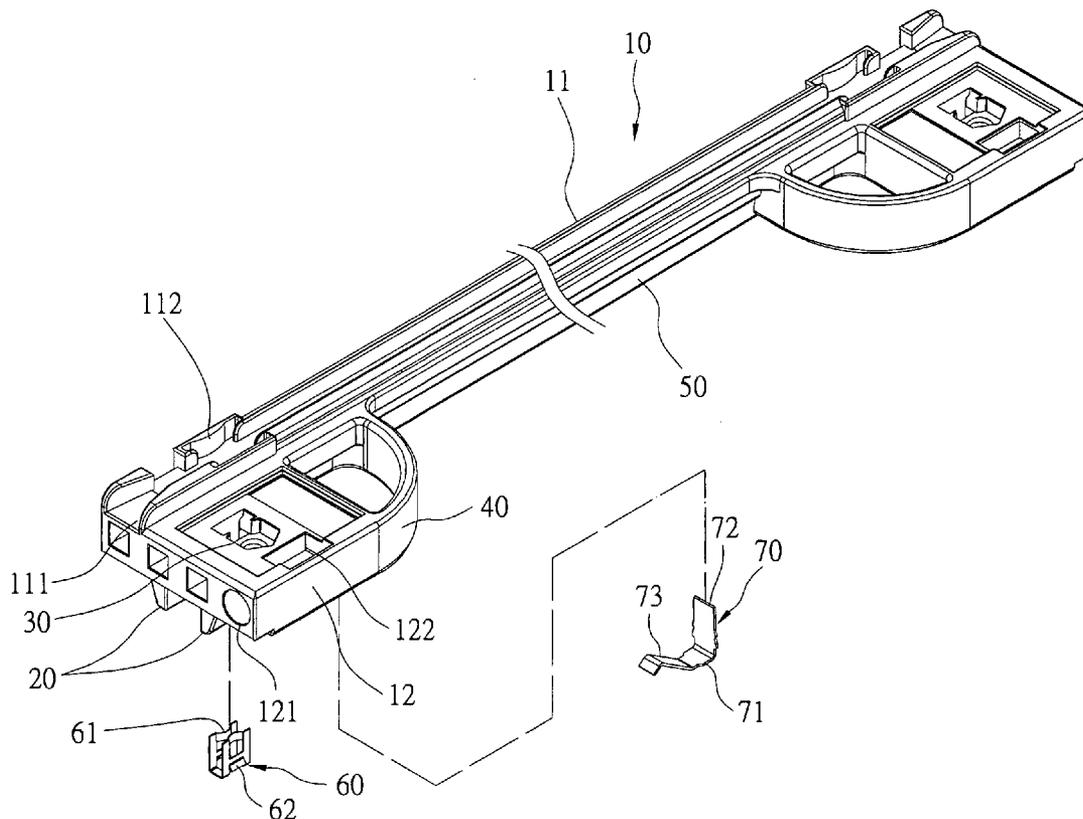
A wedged sliding trough structure includes an insulating body, at least one wedged spring-flake, and at least one pin spring-flake. The insulating body has at least one wedged spring-flake receiving slot and at least one pin spring-flake receiving slot and at least one pin spring-flake receiving slot is used for receiving the wedged spring-flake and the pin spring-flake. By adding the spring-flakes in the insulating body, the wedged sliding trough structure of the present invention has the function of preventing static electricity from discharging and has increased strength so it is less likely to be broken.

(21) Appl. No.: **11/387,724**

(22) Filed: **Mar. 24, 2006**

Publication Classification

(51) **Int. Cl.**
A47G 19/08 (2006.01)



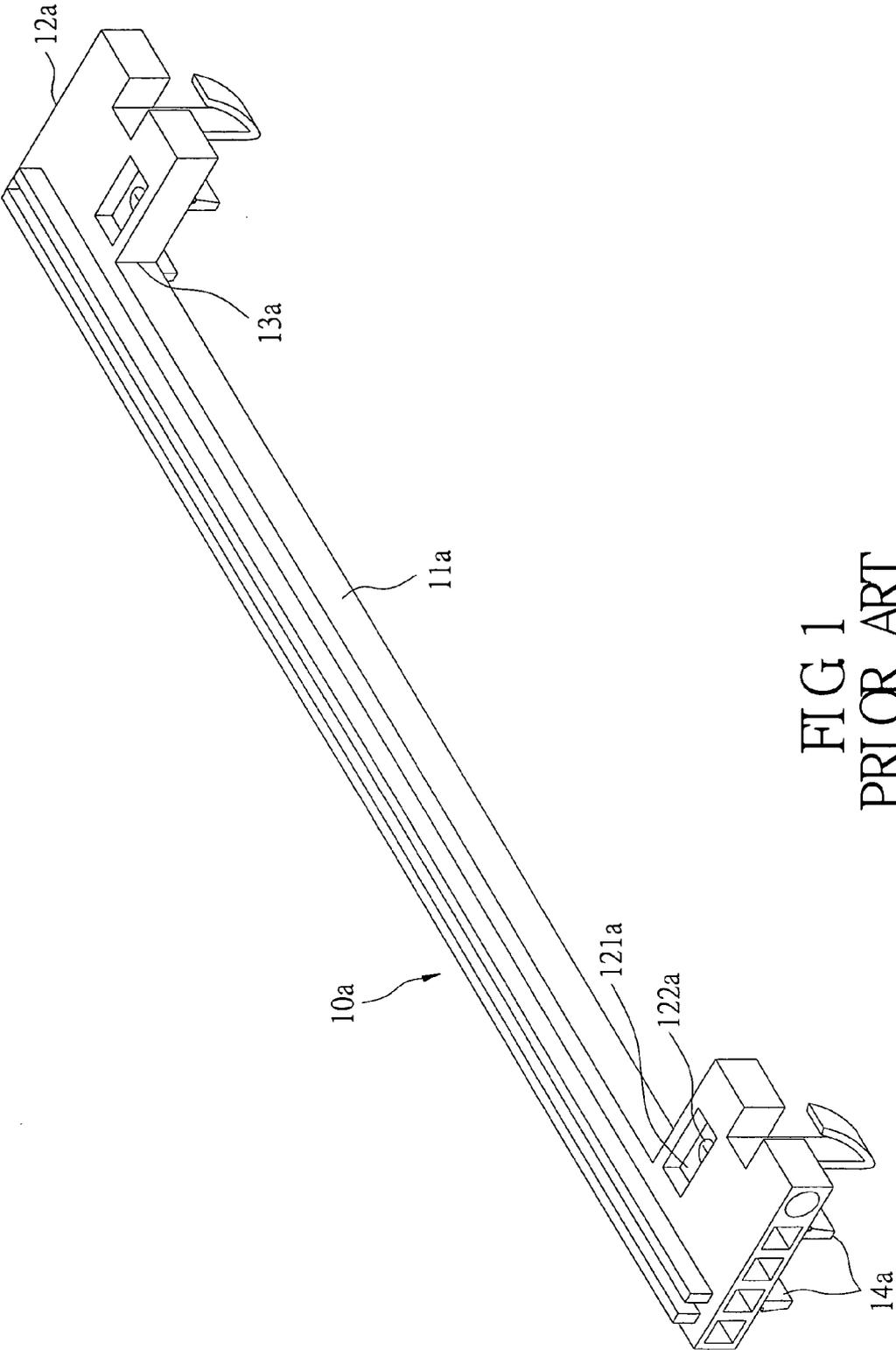


FIG 1
PRIOR ART

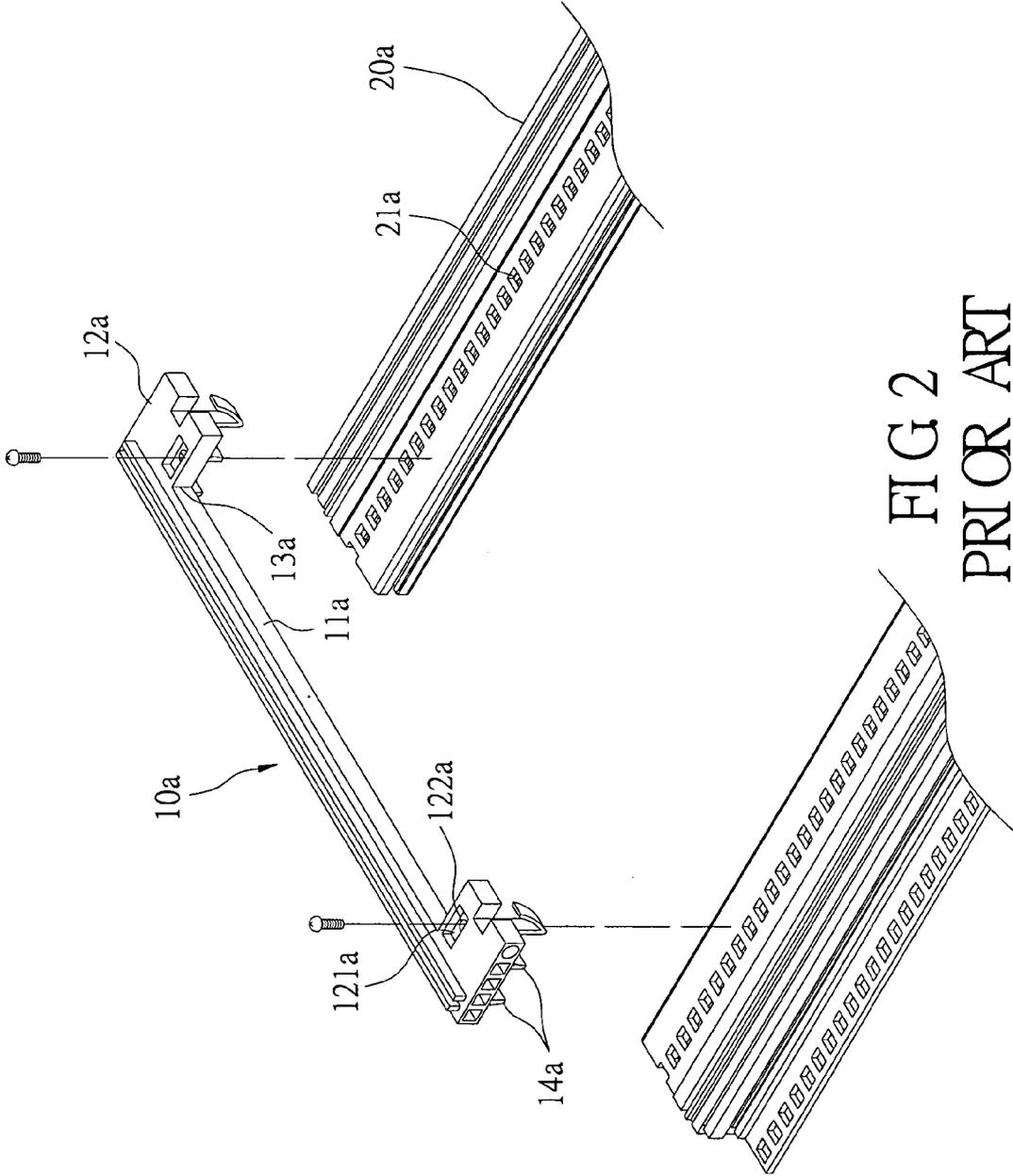


FIG 2
PRIOR ART

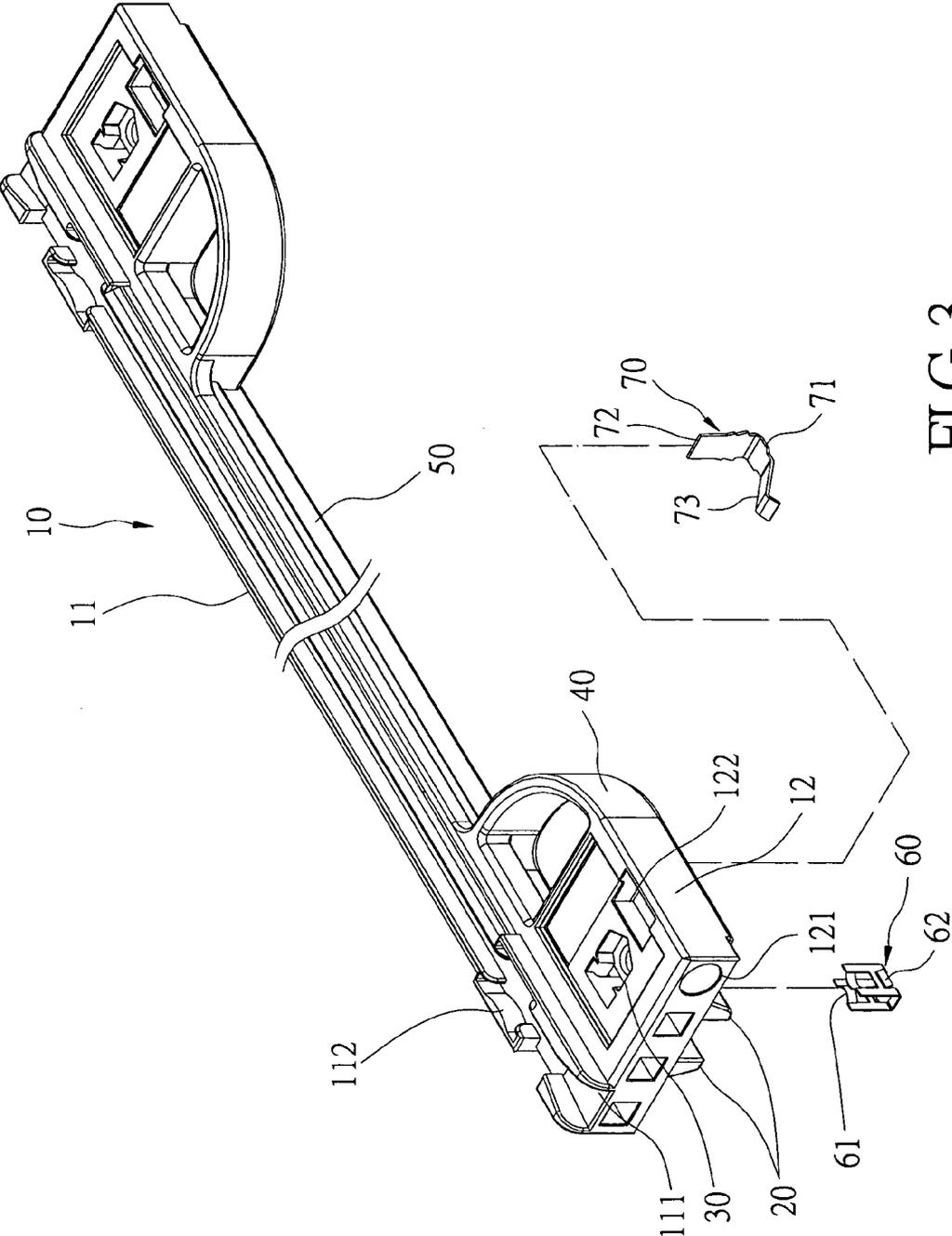


FIG 3

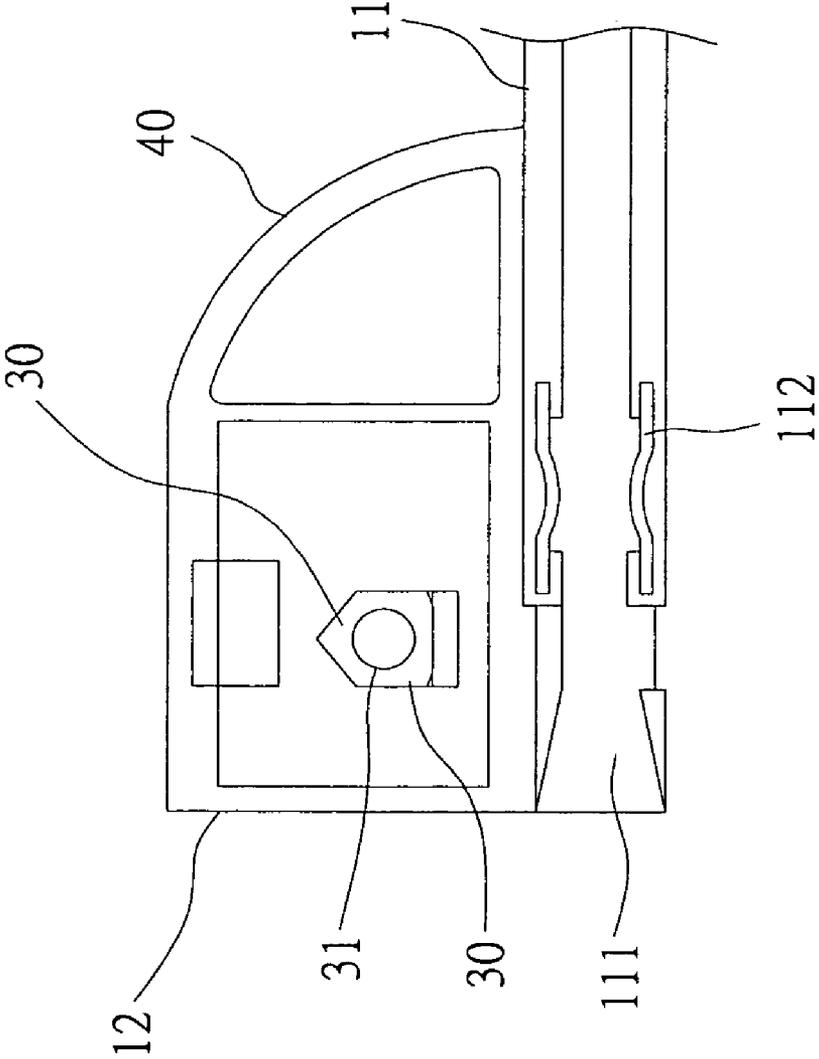


FIG 4

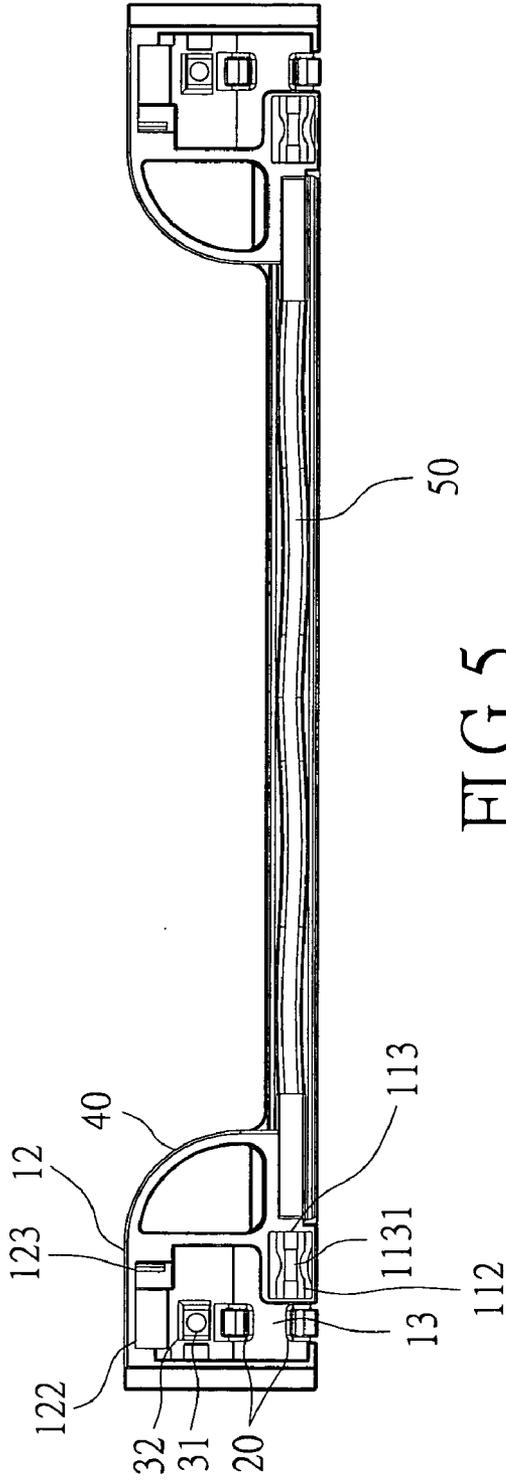


FIG 5

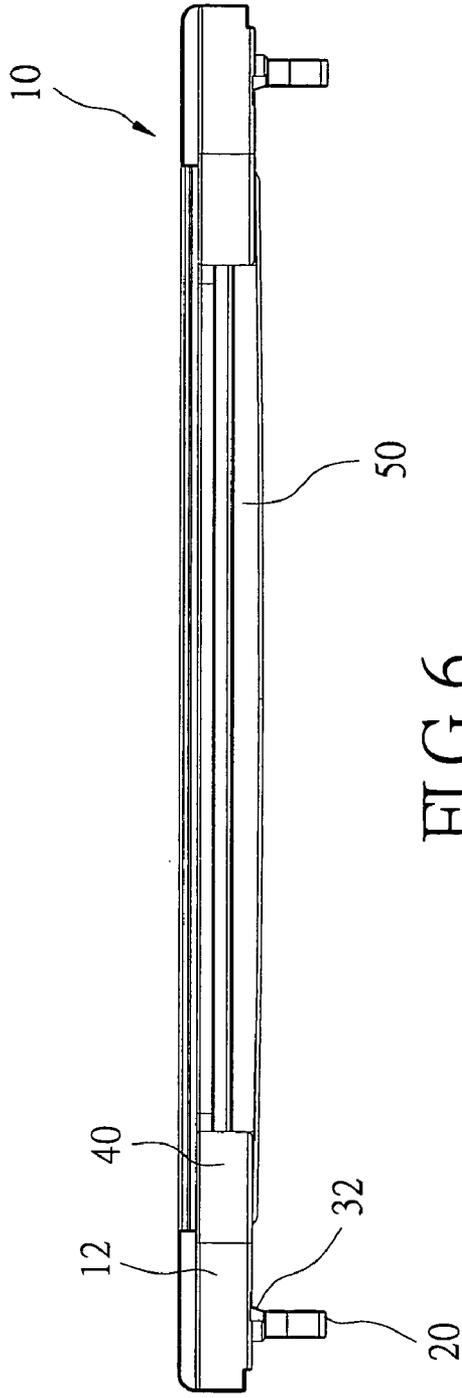


FIG 6

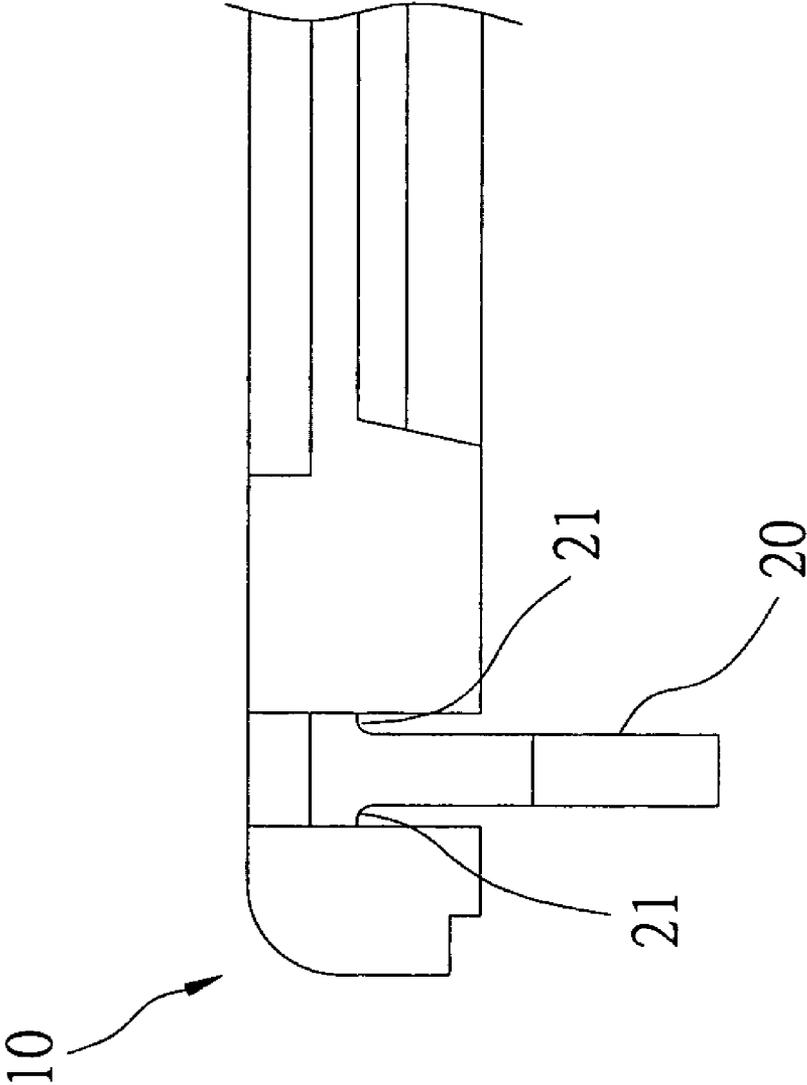


FIG 7

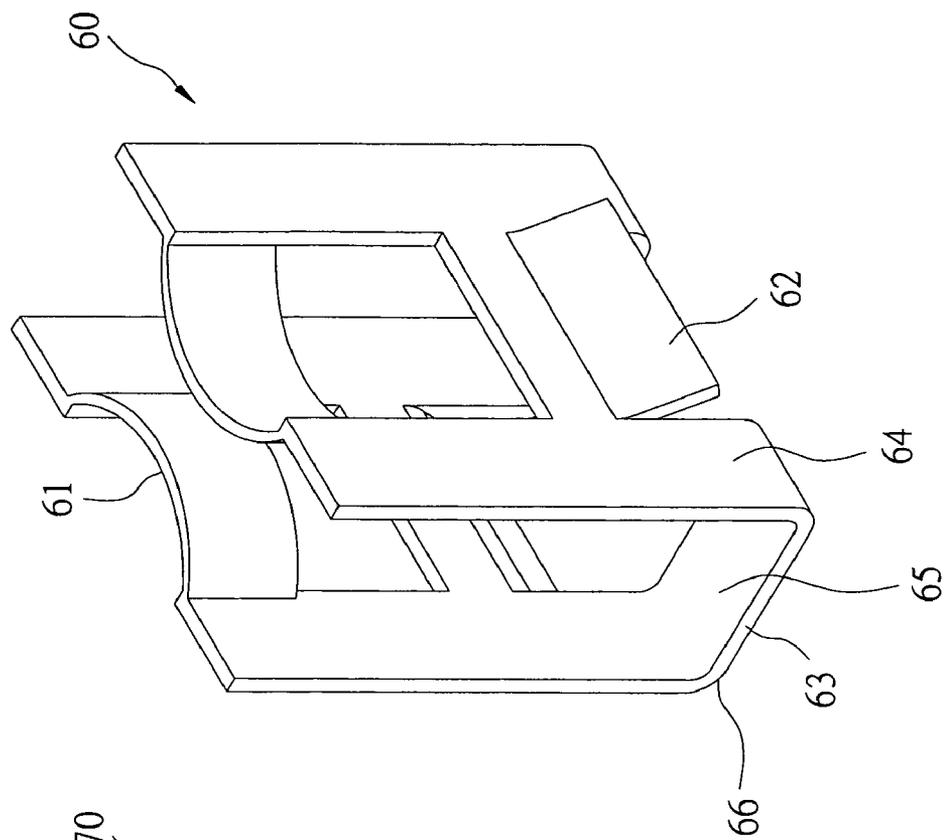


FIG 8

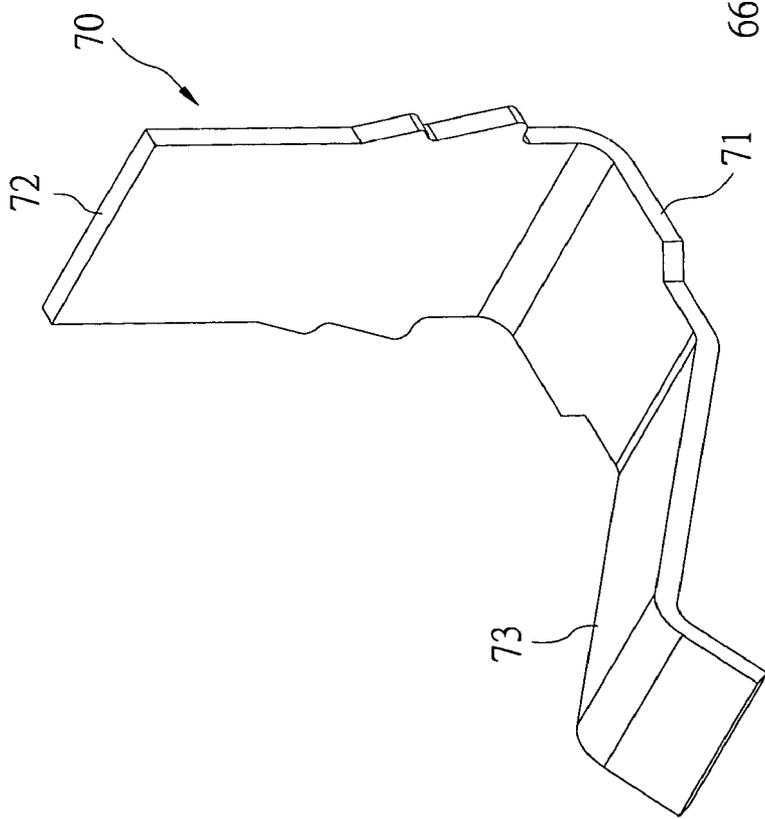


FIG 9

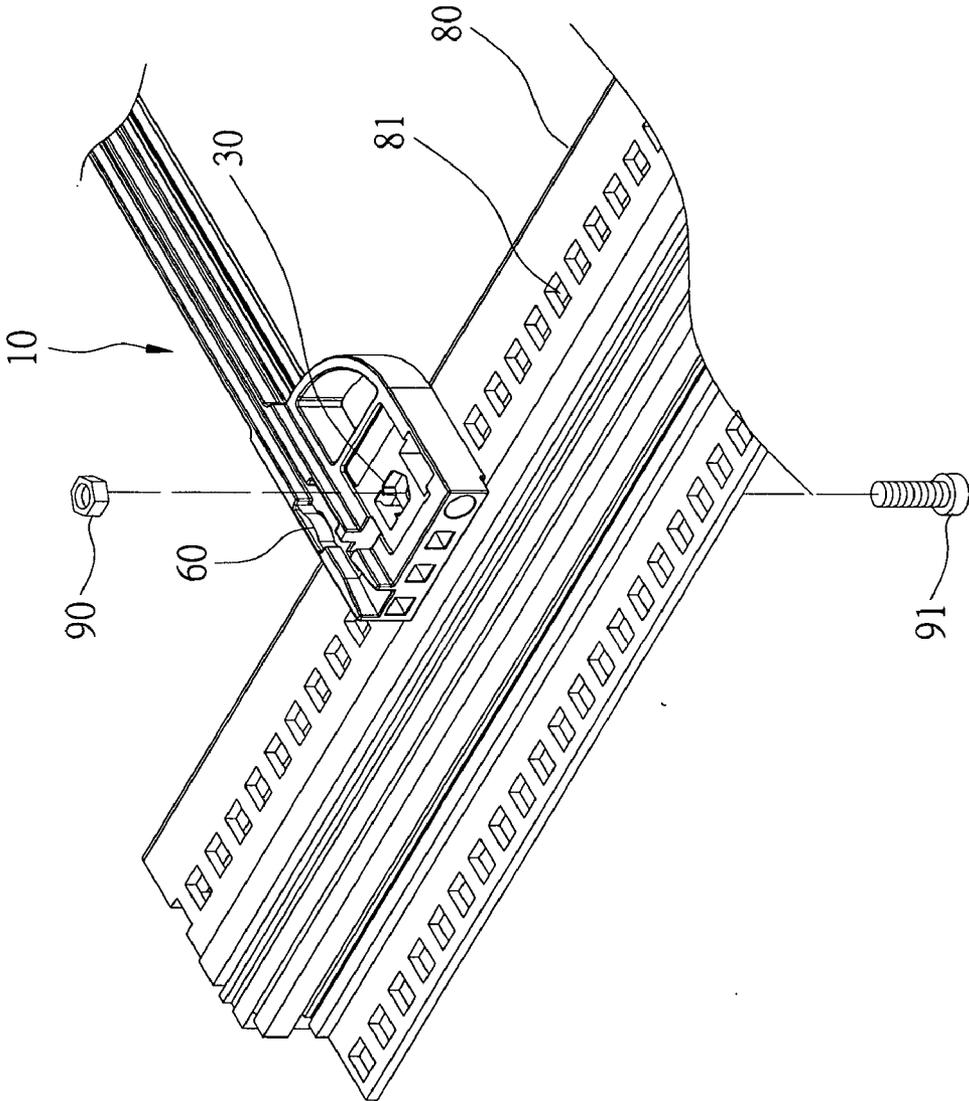


FIG 10

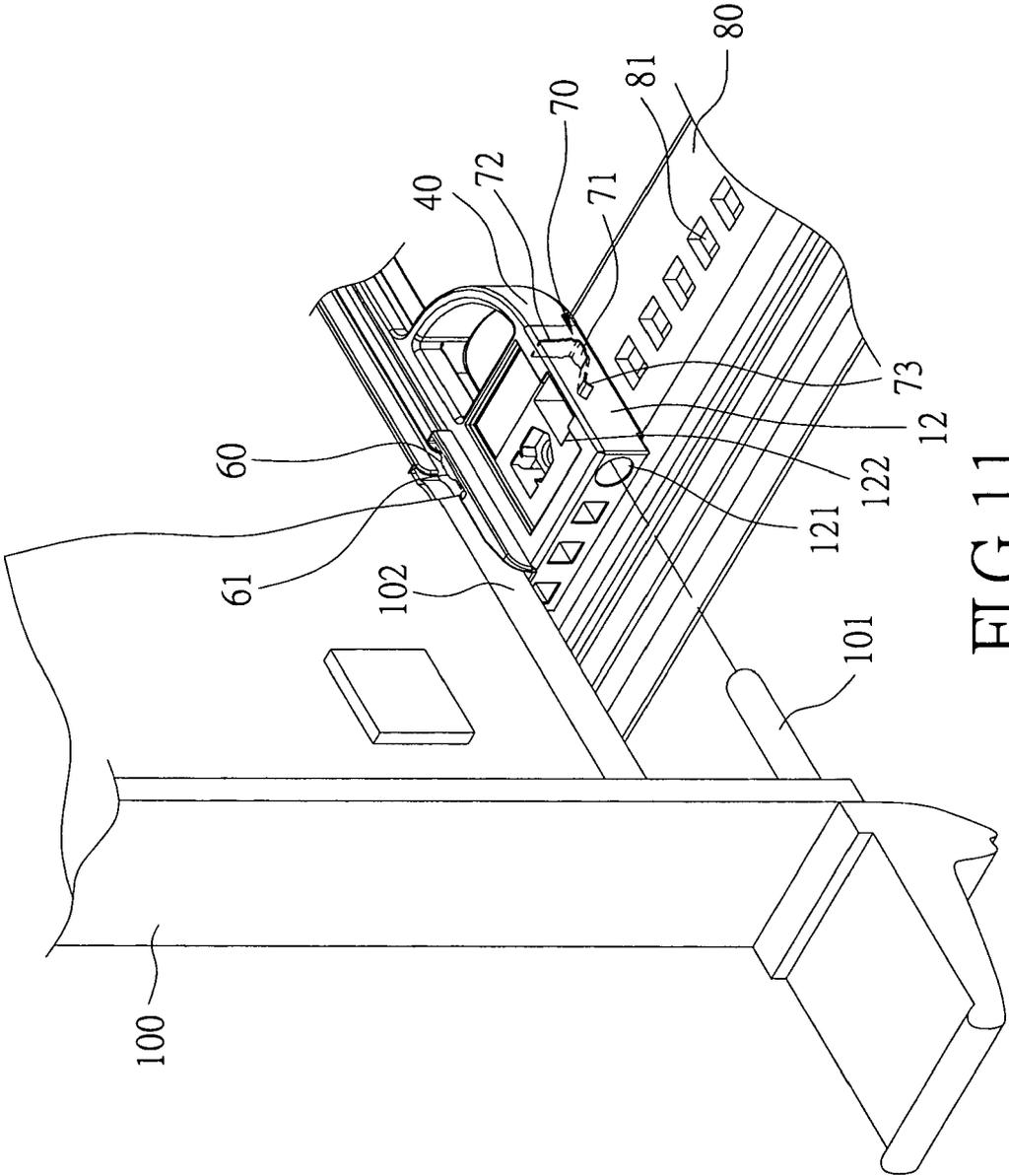


FIG 11

WEDGED SLIDING TROUGH STRUCTURE

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates to a wedged sliding trough structure. In particular, this invention relates to a wedged sliding trough structure used in the inner part of the housing of an industrial computer.

[0003] 2. Description of the Related Art

[0004] In the inner part of the housing of an industrial computer, a wedged sliding trough structure is generally assembled with a locking-supporting frame to form an interface card plugging structure. The number of the interface card slots is increased or reduced by installing the wedged sliding trough structure or disassembling the wedged sliding trough structure.

[0005] As shown in FIG. 1, the wedged sliding trough structure of the prior art has an insulating body 10a having a bridge-connecting beam 11a, a pair of fixing parts 12a, and a pair of wedged hooks 14a. The pair of fixing parts 12a are connected with the two ends of the bridge-connecting beam 11a and are located on the same side. A screw-receiving slot 121a having a through 122a is formed on each of the fixing parts 12a. The wedged hook 14a is extended downward from the inside of the insulating body 10a. As shown in FIG. 2, when the wedged sliding trough structure is assembled with the locking-supporting frame 20a, the wedged hook 14a of the insulating body 10a is plugged into the corresponding square hole 21a located on the locking-supporting frame 20a. The wedged hook 14a is wedged and locked into the square hole 21a, a self-locking screw passes through the through hole 122a to lock the insulating body 10a on the locking-supporting frame 20a. The screw nut is received in the screw-receiving slot 121a. Thereby, the insulating body 10a is locked onto the locking-supporting frame 20a.

[0006] The wedged sliding trough structure of the prior art lacks a design to prevent static electricity from discharging, and the connecting area 13a between the bridge-connecting beam 11a and the fixing part 12a is easily broken. When the wedged sliding trough structure is locked onto the locking-supporting frame 20a via the self-locking screw, it is easy shifted due to there being no locking position designed on the surface of the locking-supporting frame 20a. Therefore, the locking position is shifted and the locking-supporting frame 20a is damaged. Moreover, when the insulating body 10a is disassembled from the locking-supporting frame 20a, the wedged hook 14a is easily broken as the wedged hook 14a is inflexible.

SUMMARY OF THE INVENTION

[0007] One particular aspect of the present invention is to provide a wedged sliding trough structure that prevents static electricity from discharging and is strong.

[0008] The wedged sliding trough structure includes an insulating body having at least one wedged spring-flake receiving slot and at least one pin spring-flake receiving slot, at least one wedged spring-flake and at least one pin spring-flake. The wedged spring-flake is received in the wedged spring-flake receiving slot and the pin spring-flake is

received in the pin spring-flake receiving slot to form the wedged sliding trough structure that prevents static electricity from discharging.

[0009] For further understanding of the invention, reference is made to the following detailed description illustrating the embodiments and examples of the invention. The description is only for illustrating the invention and is not intended to be considered limiting of the scope of the claim.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] The drawings included herein provide a further understanding of the invention. A brief introduction of the drawings is as follows:

[0011] FIG. 1 is a perspective view of the wedged sliding trough structure of the prior art;

[0012] FIG. 2 is a perspective view of the wedged sliding trough structure of the prior art locked with the locking-supporting frame;

[0013] FIG. 3 is an exploded perspective view of the wedged sliding trough structure of the present invention;

[0014] FIG. 4 is a top view of the insulating body of the wedged sliding trough structure of the present invention;

[0015] FIG. 5 is a bottom view of the insulating body of the wedged sliding trough structure of the present invention;

[0016] FIG. 6 is a front view of the insulating body of the wedged sliding trough structure of the present invention;

[0017] FIG. 7 is a rear view of the insulating body of the wedged sliding trough structure of the present invention;

[0018] FIG. 8 is a perspective view of the wedged spring-flake of the wedged sliding trough structure of the present invention;

[0019] FIG. 9 is a perspective view of the pin spring-flake of the wedged sliding trough structure of the present invention;

[0020] FIG. 10 is an exploded perspective view of the wedged sliding trough structure of the present invention locked with the locking-supporting frame; and

[0021] FIG. 11 is a perspective view of the wedged sliding trough structure of the present invention assembled with the interface card.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0022] Reference is made to FIGS. 3 to 7. The wedged sliding trough structure includes an insulating body 10, a pair of wedged spring-flakes 60, and a pair of pin spring-flakes 70. The insulating body 10 includes a bridge-connecting beam 11, a pair of fixing parts 12, a pair of wedged hooks 14, and a pair of arc ribs 40. The bridge-connecting beam 11 has a pair of wedged spring-flake receiving slot 113, a sliding-slot 111 for being plugged into by an interface card, two pairs of through holes 112, and a supporting rib 50. The wedged spring-flake receiving slot 113 is located on the bottom of the bridge-connecting beam 111 and has an opening at its lower end. A positioning transverse beam 1131 is installed in the inner section of the wedged spring-flake receiving slot 113. Each pair of through holes 112 are

symmetrically located at the two sides of the sliding-slot 111. Each of the through holes 112 is interlinked with the corresponding wedged spring-flake receiving slot 113. The through holes 112 are bar-shaped and have an arc in the middle of the through hole 112 that corresponds to the wedged spring-flake 60. The supporting rib 50 is extended from the bottom of the bridge-connecting beam 11 along a waved-shaped track so as to compensate for the total proportion and width of the bridge-connecting beam 11. Therefore, the bridge-connecting beam 11 is strengthened and is not easily broken.

[0023] The pair of fixing parts 12 are installed at the two ends of the insulating body 10 and connected with the same side of the bridge-connecting beam 11. Each of the fixing parts 12 includes a fitting hole 121, a pin spring-flake receiving slot 122, a plugging slot 123, and a screw nut-receiving slot 30. The fitting holes 121 are located the side of the two ends of the insulating body 10. The pin spring-flake receiving slot 122 is located at the inner section of the front end of the fixing part 12 and interlinks with the fitting hole 121. On the upper side of the pin spring-flake receiving slot 122 there is an opening. The plugging slot 123 is square, and is adjacent to the pin spring-flake receiving slot 122 and located at the bottom of the fixing part 12. The screw nut-receiving slot 30 has a hexagon shape, is located in the inner section of the fixing part 12, and has an opening at the upper side. A leading-location column 32 extends from the bottom of the screw nut-receiving slot 30 and has a square-column shape.

[0024] The wedged hooks 20 extend from the wedged hook receiving surface 13 located in the inner section of the two ends of the insulating body 10. Between the opposite two side surfaces of each of the wedged hooks 20 and the insulating body 10, there is a cutting slot 21 which is bar-shaped. Therefore, the flexibility of the wedged hook 20 is better and the wedged hook 20 is not easily broken.

[0025] The arc ribs 40 are respectively connected with the bridge-connecting beam 11 and the inner side of the fixing part 12 so as to compensate for their connecting strength. Therefore, the insulating body 10 is not easily broken at the point where the bridge-connecting beam 11 and the fixing part 12 connect.

[0026] Reference is made to FIG. 8. The wedged spring-flake 60 has a U-shape and a bottom board 63. A side board 64 extends from each of the two sides of the bottom board 63. There is a protruding part 61 having an arc-shape located in the center of the upper end of the side board 64. An inverse thorn 62 is formed by bending the lower end of the side board 64. The wedged spring-flake 60 passes through the lower opening of the wedged spring-flake receiving slot 113 and is received in the inner section of the wedged spring-flake receiving slot 113. The inner side surface 65 of the bottom board 63 is pasted onto the positioning transverse beam 1131. The inverse thorn 62 is wedged at the two inner side surfaces of the wedged spring-flake receiving slot 113 to expose the outer side surface 66 of the bottom board 63 of the wedged spring-flake 60 from the lower opening of the bridge-connecting beam 11 and protrude to the bottom of the bridge-connecting beam 11 slightly. The protruding part 61 extends symmetrically from the two sides of the sliding slot 111 via the through hole 112 and is positioned in the sliding slot 111.

[0027] Reference is made to FIG. 9. Each of the pin spring-flakes 70 has a bottom board 71. A rectangular board 72 extends vertically and upwardly from one end of the bottom board 71. A leaning-pushing part 73 extends at a slant from another end of the bottom board 71 and the leaning-pushing part 73 is L-shaped and has elasticity. The rectangular board 72 is plugged into the plugging slot 123 located at the bottom of the fixing part 12. The top surface of the bottom board 71 leans tightly on the bottom surface of the fixing part 12. The leaning-pushing part 73 extends from the bottom of the fixing part 12 and is received in the space of the pin spring-flake receiving slot 12.

[0028] Reference is made to FIG. 10. When the insulating body 10 is combined with the locking-supporting frame 80, the wedged hook 20 and the leading-location column 32 of the insulating body 10 are plugged into the corresponding square hole 81 on the locking-supporting frame 80 to wedge and lock the wedged hook 20 into the square hole 81. The leading-location column 32 is used as a positioning column for locking. The screw nut 90 is received in the screw nut-receiving slot 30 and a screw 91 passes through the through hole 31 of the leading-location column 32 in the square hole 81 via the locking-supporting frame 80 and is then locked with the screw nut 90. Thereby, the insulating body 10 is locked with the locking-supporting frame 80. The square hole 81 is used for positioning and locking. The locking position is not shifted and the locking-supporting frame 80 is not damaged. When the insulating body 10 is disassembled, the screw nut 90 is unlocked from the screw 91 and presses the wedged hook 20 having elasticity in the square hole 81 to make the wedged hook 20 deform and escape from the square hole 81. Thereby, the insulating body 10 is easily disassembled from the locking-supporting frame 80. It is easy to disassemble the insulating body 10 and the wedged hook 20 is not easily broken.

[0029] Reference is made to FIG. 11. When the insulating body 10 is installed on the locking-supporting frame 80, the wedged spring-flake 60 on the bottom of the bridge-connecting beam 11 contacts the surface of the locking-supporting frame 80, and the bottom of the bottom board 71 of the pin spring-flake 70 also contacts the surface of the locking-supporting frame 80. When the interface card is plugged into the sliding slot 111, the wedged spring-flake protruding part 61 extending from the through hole 112 and located at the two sides of the sliding slot 111 leans tightly against the grounding area 102 located at the side of the interface card 100. The pin 101 of the interface card 100 is plugged into the fitting hole 121, extends into the pin spring-flake receiving slot 122, and contacts the leaning-pushing part 73 of the pin spring-flake 70 received in the pin spring-flake receiving slot 122. Therefore, static electricity is conducted to the locking-supporting frame 80 via the wedged spring-flake 60 and the pin spring-flake 70 so as to prevent static electricity from discharging.

[0030] The present invention uses the arc ribs 40 and the supporting ribs 50 etc, to enhance the strength of the wedged sliding trough structure. The present invention also uses the wedged spring-flake 60 and the pin spring-flake 70 to achieve the effect of preventing static electricity from discharging. It is easy and fast to disassemble and assemble the wedged sliding trough structure. The problem of locking the wedged sliding trough structure with the locking-supporting frame at a shifted location is also avoided.

[0031] The description above only illustrates specific embodiments and examples of the invention. The invention should therefore cover various modifications and variations made to the herein-described structure and operations of the invention, provided they fall within the scope of the invention as defined in the following appended claims.

What is claimed is:

1. A wedged sliding trough structure, used in combination with a locking-supporting frame, comprising:

an insulating body having a sliding slot, wherein the insulating body comprises at least one wedged spring-flake receiving slot and at least one pin spring-flake receiving slot;

at least one wedged spring-flake received in the wedged spring-flake receiving slot; and

at least one pin spring-flake received in the pin spring-flake receiving slot.

2. The wedged sliding trough structure as claimed in claim 1, wherein a wedged hook receiving surface is located in the inner section of each of the two ends of the insulating body, and a pair of wedged hooks 20 extend downward from the wedged hook receiving surface, and the opposite two side surfaces of each of the wedged hooks 20 has a cutting slot.

3. The wedged sliding trough structure as claimed in claim 1, wherein the insulating body comprises a bridge-connecting beam and a pair of fixing parts, wherein the pair of the fixing parts are located at the two ends of the insulating body and are connected with the same side of the bridge-connecting beam.

4. The wedged sliding trough structure as claimed in claim 3, wherein the insulating body comprises a pair of arc ribs, and the pair of the arc ribs are connected with the bridge-connecting beam and the inner of the pair of the fixing part.

5. The wedged sliding trough structure as claimed in claim 3, wherein the bridge-connecting beam comprises at least one pair of through holes corresponding to the wedged spring-flake receiving slot, wherein the wedged spring-flake

receiving slot is located at the bottom of the bridge-connecting beam and there is an opening at the lower side of the wedged spring-flake receiving slot, and the pair of the through holes are respectively located at the two sides of the sliding slot and interlink with the wedged spring-flake receiving slot.

6. The wedged sliding trough structure as claimed in claim 3, wherein each of the fixing parts comprises at least one fitting hole and at least one plugging slot, wherein the fitting holes are located at the side surfaces of the two ends of the insulating body, the pin spring-flake receiving slot is located at the inner of the front end of the fixing part and interlinks with the fitting hole, and the plugging slot is adjacent to the pin spring-flake receiving slot and located at the bottom of the fixing part.

7. The wedged sliding trough structure as claimed in claim 3, wherein at least one screw nut-receiving slot is located at the inner section of the fixing part, wherein on the upper side of the screw nut-receiving slot a leading-location column having a through hole extends from the bottom of the screw nut-receiving slot and the leading-location column has a square-column shaped.

8. The wedged sliding trough structure as claimed in claim 1, wherein the insulating body comprises a supporting rib, and the supporting rib extends from the bottom of the bridge-connecting beam along a waved-shape track.

9. The wedged sliding trough structure as claimed in claim 1, wherein the wedged spring-flake has a bottom board, wherein a side board extends from each of the two sides of the bottom board, there is a protruding part having an arc-shape located in the center of the upper end of the side board, and an inverse thorn is formed by bending the lower end of the side board.

10. The wedged sliding trough structure as claimed in claim 1, wherein the pin spring-flake has a bottom board, a rectangular board is extended vertically and upwardly from one end of the bottom board, and a leaning-pushing part having elasticity extends at a slanted from another end of the bottom board.

* * * * *