In a snap-in fan seat and heat sink, the fan seat is provided for latching a cooling body having a notch formed on both sides of the cooling body separately, and the fan seat includes a seat body installed onto a side of the heat sink, a buckle separately and pivotally coupled to both opposite sides of the seat body, a buffer unit installed to the seat body and at a position proximate to a side of the heat sink and pressed against the heat sink, and each buckle includes a hook plate latched into the notch for mounting a fan onto the seat body, and then the seat body is latched onto the cooling body to constitute the heat sink, so as to simplify the way of assembling the fan seat and the cooling body and enhance the convenience of use.
SNAP-IN FAN SEAT AND HEAT SINK HAVING THE SAME

FIELD OF THE INVENTION

[0001] The present invention relates to a fan seat, in particular to a snap-in fan seat.

BACKGROUND OF THE INVENTION

[0002] In general, electronic components generate heat during their operation, and the heat generated inside the electronic components increases as science and technology advance and the performance of electronic devices becomes increasingly higher, so that most electronic devices require a heat dissipating device to control the operating temperature in order to maintain a normal operation of the electronic devices.

[0003] Present existing heat dissipating device installed in a computer component usually comprises a heat sink and a fan mounted onto the heat sink, wherein the heat sink is comprised of components such as a heat pipe and a heat conducting base, and the heat dissipating device is attached to a heat generating component for conducting the heat generated by the heat generating component to the heat sink, and an airflow produced by the operation of the fan blows the heat towards the heat sink, such that the heat can be dissipated by the heat sink to maximize the efficiency of the heat dissipating device.

[0004] In a conventional heat dissipating device, the fan is mounted onto the heat sink by fasteners, such as those having screw holes formed on the fins and provided for securing the fan. However, the process of manufacturing the screw holes on the fins is tedious and time-consuming, and thus incurring a higher cost. In addition, the screws of the fins may be deformed or damaged easily when compressed, and the screws secured to the fins may be loosed by vibrations to produce noises. Since the fan can be mounted and secured at a specific position only and the fan cannot be adjusted according to the requirement, therefore the application is very inconvenient.

[0005] In view of the aforementioned problems, the inventor of the present invention conducted extensive researches and experiments and finally provided a feasible design to overcome the aforementioned problems.

SUMMARY OF THE INVENTION

[0006] Therefore, it is a primary objective of the present invention to provide a snap-in fan seat capable of simplifying the way of assembling a fan seat and a cooling body, and adjusting the position of the fan seat to improve the convenience of use.

[0007] Another objective of the present invention is to provide a snap-in fan seat having a buffer unit installed between the seat body and the cooling body for absorbing vibrations produced by the operation of a fan to avoid the production of noises.

[0008] To achieve the foregoing objectives, the present invention provides a snap-in fan seat snapped onto a cooling body and having notches formed on both sides of the cooling body respectively. The fan seat comprises a seat body and a pair of buckles, and the seat body is installed to a side of the cooling body, and a buffer unit is installed at a position proximate to a side of the seat body and pressed against the cooling body, and the buckles are pivotally coupled to two opposite sides of the seat body respectively, and each buckle includes a hook plate latched into the notch for combining the seat body to the cooling body.

[0009] A further objective of the present invention is to provide a heat sink with the snap-in fan seat capable of simplifying the way of assembling the fan seat and the cooling body, adjusting the fixed position of the fan seat at the cooling body, and improving the convenience of use.

[0010] To achieve the foregoing objectives, the present invention provides a heat sink with the snap-in fan seat, comprising a cooling body, a seat body, a fan and a pair of buckles. The cooling body comprises a plurality of fins, each having a notch formed on two opposite sides of the fin separately, and a heat dissipating channel formed between any two adjacent fins, wherein the seat body is installed on a side of the fin, and the seat body includes a buffer unit installed at a position proximate to a side of the fin and pressed against the fin, and the fin is fixed onto the seat body, such that an airflow produced by the fan is blown at the heat dissipating channel, and the buckles are pivotally coupled to two opposite sides of the seat body respectively, and each buckle comprises a hook plate latched into the notch for combining the seat body onto the cooling body.

[0011] Compared with the prior art, the fins of the present invention no longer require any screw hole or have the issue of compressing, deforming or damaging the screws. The present invention can be used for fixing a pair of buckles to the seat body of the fan, and the cooling body includes a notch, such that after the fixed position of the seat body is adjusted, the buckles are latched onto the notches to install the fan seat onto a side of the cooling body easily, so as to simplify the way of combining the fan seat and the cooling body. In addition, the fixed position of the fan seat can be adjusted along the notch of the cooling body as needed to improve the convenience of use. The present invention further includes a buffer unit installed between the fan seat and the cooling body for absorbing the vibrations produced by the operation of the buffer unit to avoid the production of noises.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] FIG. 1 is a perspective view of a heat sink of the present invention;
[0013] FIG. 2 is a schematic view of combining a heat sink of the present invention;
[0014] FIG. 3 is a schematic view of combining a fan and a seat body of the present invention;
[0015] FIG. 4 is an exploded view of a seat body and a buckle of the present invention;
[0016] FIG. 5 is a cross-sectional view of a seat body and a buckle of the present invention;
[0017] FIG. 6 is a schematic view of adjusting a fan seat of the present invention;
[0018] FIG. 7 is a schematic view of snapping a fan seat of the present invention;
[0019] FIG. 8 is a schematic view of a positioning arm extended separately from both side of a seat body of the present invention;
[0020] FIG. 9 is a schematic view of another use of a snap-in fan seat of the present invention;
[0021] FIG. 10 is a schematic view of a snap-in fan seat according to a second preferred embodiment of the present invention;
Fig. 11 is a schematic view of a buffer unit of the snap-in fan seat according to the second preferred embodiment of the present invention; and

Fig. 12 is a schematic view of a buffer unit of a snap-in fan seat in accordance with a third preferred embodiment of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The technical characteristics and contents of the present invention will become apparent with the following detailed description and related drawings. The drawings are provided for the purpose of illustrating the present invention only, but not intended for limiting the scope of the invention.

With reference to Fig. 1 for a perspective view of a heat sink of the present invention provides a heat sink 1 with a snap-in fan seat, comprising a heat conducting base 10, a plurality of heat pipes 20, a plurality of fins 30, a seat body 40, a fan 50 and a pair of buckles 60.

With reference to Figs. 2 to 5 for a schematic view of combining a heat sink, a schematic view of combining a fan and a seat body, an exploded view of a seat body and a buckle and a cross-sectional view of combining the seat body and the buckle in accordance with a first preferred embodiment of the present invention, the heat conducting base 10, the plurality of heat pipes 20 and the plurality of fins 30 constitute a cooling body, that is the cooling body is presented as a fin-type cooling structure. In a practical application, the cooling body can be of an aluminum extruded type. The heat conducting base 10 is made of metal such as copper and silver with a good thermal conductivity, and each heat pipe 20 has a heat absorbing section 21 and a heat discharging section 22, and the heat absorbing sections 21 of the heat pipes 20 are fixed to the heat conducting base 10, and the heat discharging sections 22 are passed into the fins 30, and the fins 30 are horizontally combined onto the heat conducting base 10.

A heat dissipating channel 300 is formed between any two adjacent fins 30, and each fin 30 has a substantially L-shaped notch 31 formed on two opposite sides of the fin 30 separately. However, the notch 31 is not limited to the L-shaped shape only, but any other shape capable of catching the pair of buckles 60 can be adopted.

The seat body 40 for combining the fan 50 is installed on a side of the cooling body, and particularly, the seat body 40 of this preferred embodiment is installed on a side of the fins 30, and the pair of buckles 60 are respectively and pivotally coupled to two opposite sides of the seat body 40 for combining the seat body 40 to the fins 30, so that an airflow produced by the fan 50 blows at the heat dissipating channel 300.

A side of the seat body 40 proximate to the cooling body has an elastomeric resilient force and is pressed by a buffer unit 41 of the cooling body. The buffer unit 41 of this preferred embodiment is installed between the seat body 40 and the fins 30 and elastically pressed against the fins 30 for absorbing vibrations produced by the operation of the fan 50 to avoid the production of noises. In addition, the vibration absorption capability of the buffer unit 41 can prevent wobble easily caused by frictions between the seat body 40 and the fins 30. The buffer unit 41 of this preferred embodiment is a rubber roller installed at the bottom of the seat body 40.

In addition, at least one positioning arm 42 is extended separately from both sides of the seat body 40. Particularly, a pair of positioning arms 42 of this preferred embodiment are extended from both sides of the seat body 40 respectively, and integrally formed with the seat body 40, and a positioning plate 421 is extended from an end of the positioning arm 42 towards the notch 31 of the fin 30, and the seat body 40 is latched into the notch 31 of the fin 30 by a positioning plate 421 of the positioning arm 42, and the buffer unit 41 produces a reaction by the elastic compression to prop and temporarily hold its position at a side of the fins 30 to facilitate users to adjust the fixed position of the seat body 40.

The buckles 60 are combined to two opposite sides of the seat body 40 respectively and installed between the two positioning arms 42 of the seat body 40. Each buckle 60 includes a press plate 61, a hook plate 62, and a pin 63, wherein the press plate 61 is pivotally coupled between the pair of positioning arms 42 and a pivot 610 is installed separately on both sides of the press plate 61 of this preferred embodiment, and each of the two positioning arms 42 has a combining hole 420 formed opposite to the corresponding pivot 610, and the pivot 610 of the press plate 61 is passed into the combining hole 420 of the positioning arm 42 to pivotally couple the press plate 61 between the pair of positioning arms 42, and the pivot 610 can be installed from a different direction, wherein a combining hole (not shown in the figure) is formed on both sides of the press plate 61 separately, and a pivot is installed on the pair of positioning arms 42 separately, such that the pivots of the pair of positioning arms 42 can be passed into the combining holes respectively to pivotally couple the press plate 61 between the pair of positioning arms 42.

In addition, the press plate 61 includes a slot 611, and a through hole 612 formed on both sides of the press plate 61 separately. The hook plate 62 is an L-shaped plate, and a protrusion 621 is extended from an end of the hook plate 62 and disposed opposite to the slot 611, and the protrusion 621 has a shaft hole 6210 formed at a position corresponding to the through hole 612, and the pin 63 is passed into the through hole 612 and the shaft hole 6210 to pivotally couple the hook plate 62 to the press plate 61, and the protrusion 621 is movably combined into the slot 611 of the press plate 61, such that the press plate 61 can be turned to drive the hook plate 62 to latch the hook plate 62 into the notch 31 of the fin 30.

With reference to Figs. 6 and 7 for schematic views of adjusting and latching a fan seat of the present invention respectively, the seat body 40 is installed into a side of the fins 30, and a user can hold the seat body 40, such that the two positioning arms 42 can be moved along the notch 31 of the fin 30 to adjust the fixed position of the seat body 40.

After the seat body 40 is moved to a predetermined position, the press plate 61 of the buckle 60 can be turned to drive the hook plate 62 to hook into the notch 31 of the fin 30, and then the press plate 61 is pressed, such that the buckle 60 can be latched into the notch 31 of the fin 30, so that the seat body 40 and the fan 50 can be combined securely to a side of the fins 30. Now, a buffer unit 41 is elastically pressed between the seat body 40 and the fan 50 for providing the function of reducing vibrations to avoid the production of noises.

With reference to FIG. 8 for a schematic view of a positioning arm extended separately from both sides of a seat body of the present invention, the only difference of this positioning arm from that as illustrated in FIG. 3 resides on that a positioning arm 42' is arranged on a side of the seat body 40, and another positioning arm 42" is arranged on the other side of the seat body 40, and a positioning plate 421' is formed
on the positioning arm 42", and another positioning plate 421" is formed on the other positioning arm 42". In addition, the two positioning arms 42, 42" are symmetrically installed on both sides of the pair of buckles 60. In other words, when the positioning arm 42 on a side of the seat body 40 is formed at the top of the buckle 60, the positioning arm 42" on the other side of the seat body 40 is formed at the bottom of the buckle 60 to provide a secured positioning effect.

[0036] With reference to FIG. 9 for another use of a snap-in fan seat in accordance with a preferred embodiment of the present invention, the differences between this preferred embodiment and the first preferred embodiment include the arrangement of fins and the positioning of the seat, wherein the fins 30 of this preferred embodiment are perpendicularly arranged and combined to the heat conducting base 10, and the seat body 40 is fixed to the top of the fins 30, such that an airflow produced by the operation of the fan 50 is not blown at the fins 30 only, but also blowing towards the heat conducting base 10 and heat generating components (not shown in the figure) to improve the heat dissipating efficiency of the heat sink 1.

[0037] With reference to FIG. 10 for a snap-in fan seat in accordance with a second preferred embodiment of the present invention, the difference between this preferred embodiment and the first preferred embodiment resides on the way of combining the seat body 40a and the fan 50, and the seat body 40a of this preferred embodiment comprises a first seat body 401a and a second seat body 402a, and a buckle 60a is provided for combining the first seat body 401a and the second seat body 402a. The first seat body 401a has a pair of positioning arms 42a extended from a side pivotally coupled to the buckle 60a, and the positioning arm 42a and the seat body 40a are integrally formed, and there is no positioning plate extended from an end of the positioning arm 42a. During use, the first seat body 401a and the second seat body 402a are combined with the fan 50, and then the first seat body 401a and the second seat body 402a are latched to the cooling body.

[0038] With reference to FIGS. 11 and 12 for a buffer unit of a snap-in fan seat in accordance with a third preferred embodiment of the present invention, the buffer unit 41 is as shown in FIG. 9 comprises an elastic element 41a (such as a spring) combined to the bottom of the seat body 40, and a rigid element 412a (such as a plastic ball) fixed to the elastic element 41a and pressed against the rigid element 412a, and the elastic element 41a will be elastically deformed to change the fixed position of the rigid element 412a for absorbing vibrations produced by the operation of the fan 50. In FIG. 10, a buffer unit 41b includes a rubber pad having an elastic resilience.

[0039] While the invention has been described by means of specific embodiments, numerous modifications and variations could be made thereto by those skilled in the art without departing from the scope and spirit of the invention set forth in the claims.

What is claimed is:

1. A snap-in fan seat, snapped to a cooling body, and the cooling body having a notch formed on both sides of the cooling body, and the fan seat comprising:

   a seat body, installed onto a side of the cooling body; and
   having a buffer unit installed proximate to a side of the cooling body and pressed against the cooling body; and
   a pair of buckles, respectively and pivotally coupled to two opposite sides of the seat body, and each of the buckle including a hook plate latched into the notch for combining the seat body onto the cooling body.

2. The snap-in fan seat of claim 1, further comprising at least one positioning arm extended from both sides of the seat body separately, and the hook plate being disposed adjacent to the positioning arm.

3. The snap-in fan seat of claim 1, further comprising at least one positioning arm extended from both sides of the seat body separately, and the hook plate being disposed between the pair of positioning arms.

4. The snap-in fan seat of claim 3, wherein the positioning arm includes a positioning plate extended from an end of the positioning arm towards the notches.

5. The snap-in fan seat of claim 2, further comprising a positioning arm extended from a side of the seat body, and another positioning arm extended from the other side of the seat body, and the two positioning arms being respectively and symmetrically installed on both upper and lower sides of the pair of buckles.

6. The snap-in fan seat of claim 1, wherein the buckle further includes a press plate pivotally coupled to a side of the positioning arm, and the press plate includes a slot for pivotally coupling the hook plate therein.

7. The snap-in fan seat of claim 3, wherein the buckle further includes a press plate pivotally coupled between the pair of positioning arms, and the press plate includes a slot for pivotally coupling the hook plate therein.

8. The snap-in fan seat of claim 1, wherein the hook plate is an L-shaped plate.

9. The snap-in fan seat of claim 1, wherein the buffer unit is a rubber pad.

10. The snap-in fan seat of claim 1, wherein the buffer unit is a rubber roller combined to the bottom of the seat body.

11. The snap-in fan seat of claim 1, wherein the buffer unit includes an elastic element combined to the bottom of the seat body and a rigid element fixed onto the elastic element.

12. The snap-in fan seat of claim 1, further comprising a fan mounted onto the seat body.

13. A heat sink having a snap-in fan seat, comprising:

   a cooling body, having a plurality of fins, and each fin having a notch formed at two opposite sides of the fin separately, and a heat dissipating channel formed between any two adjacent fins;
   a seat body, installed onto a side of the fins, and having a buffer unit installed at a position proximate to a side of the fins and pressed against the fins;
   a fan, mounted onto the seat body, for blowing an airflow at the heat dissipating channel; and
   a pair of buckles, respectively and pivotally coupled to two opposite sides of the seat body, and each of the buckles including a hook plate latched into the notch for combining the seat body to the cooling body.

14. The heat sink having a snap-in fan seat as recited in claim 13, further comprising a heat conducting base and a plurality of heat pipes fixed to the fins, and each of the heat pipes having a heat absorbing section and a heat discharging section, and the heat absorbing sections being fixed onto the heat conducting base, and the heat discharging sections being passed through the fin.

15. The heat sink having a snap-in fan seat as recited in claim 13, wherein the notch is substantially L-shaped.

16. The heat sink having a snap-in fan seat as recited in claim 13, wherein the seat body includes at least one posi-
positioning arm extended from both sides of the seat body, and the hook plate is disposed adjacent to the positioning arm.

17. The heat sink having a snap-in fan seat as recited in claim 13, wherein the seat body includes a pair of positioning arms installed at both sides of the seat body respectively, and the hook plate is installed between the pair of positioning arms.

18. The heat sink having a snap-in fan seat as recited in claim 17, wherein the positioning arm includes a positioning plate installed at an end of the positioning arm and extended towards the notch.

19. The heat sink having a snap-in fan seat as recited in claim 16, wherein the seat body includes a positioning arm extended from a side of the seat body, and another positioning arm extended from the other side of the seat body, and the two positioning arms are respectively and symmetrically installed onto both upper and lower sides of the pair of buckles.

20. The heat sink having a snap-in fan seat as recited in claim 16, wherein the buckle further includes a press plate pivotally coupled to a side of the positioning arm, and the press plate includes a slot for pivotally coupling the hook plate therein.

21. The heat sink having a snap-in fan seat as recited in claim 17, wherein the buckle further includes a press plate pivotally coupled between the pair of positioning arms, and the press plate includes a slot for pivotally coupling the hook plate therein.

22. The heat sink having a snap-in fan seat as recited in claim 13, wherein the hook plate is an L-shaped plate.

23. The heat sink having a snap-in fan seat as recited in claim 13, wherein the buffer unit is a rubber pad.

24. The heat sink having a snap-in fan seat as recited in claim 13, wherein the buffer unit is a rubber roller combined to the bottom of the seat body.

25. The heat sink having a snap-in fan seat as recited in claim 13, wherein the buffer unit includes an elastic element combined to the bottom of the seat body and a rigid element fixed onto the elastic element.

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