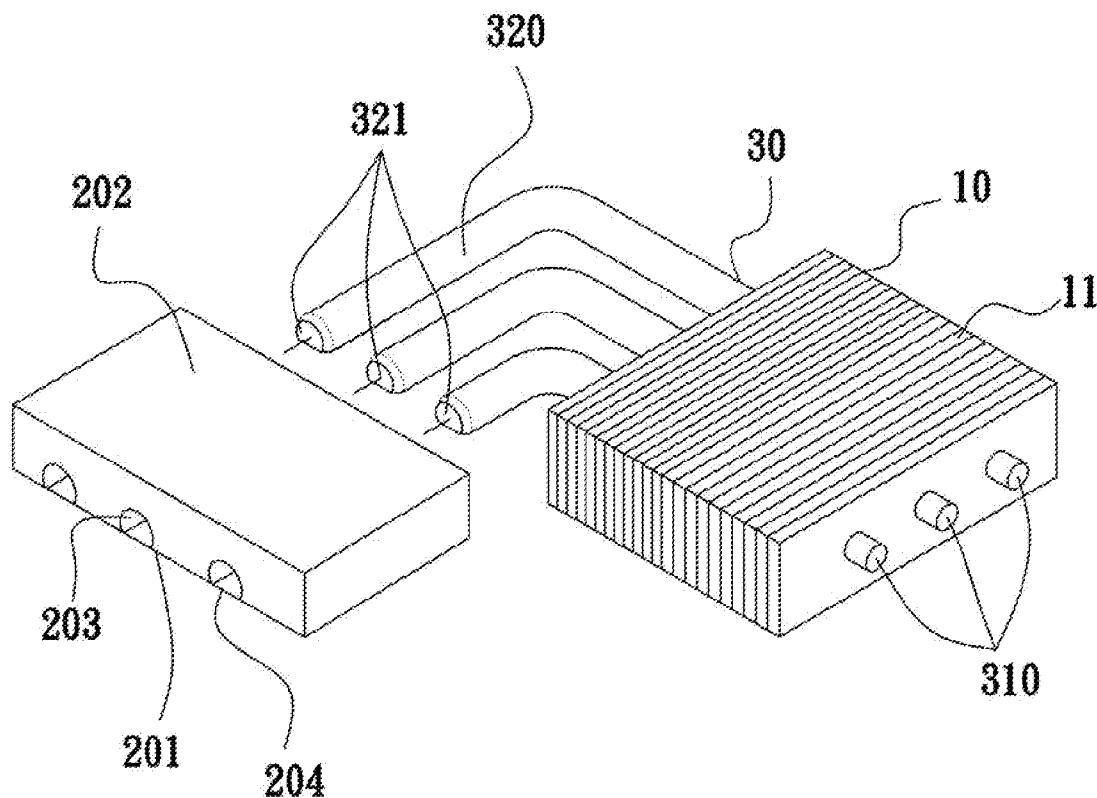




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(19) **United States**(12) **Patent Application Publication**
WU(10) **Pub. No.: US 2011/0290450 A1**(43) **Pub. Date: Dec. 1, 2011**(54) **HEAT DISSIPATION MODULE**(52) **U.S. Cl. 165/104.26**(75) **Inventor:** **CHUN-MING WU**, Hsin Chuang
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CO., LTD., Hsin Chuang City (TW)(21) **Appl. No.:** **12/790,935**(22) **Filed:** **May 31, 2010****Publication Classification**(51) **Int. Cl.**
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A heat dissipation module includes a cooling base, a heat dissipating component, and at least one heat pipe. The cooling base includes a heating surface and a conducting surface. On the heating surface is disposed at least one joining part to hold and connect the heat pipe. The heat pipe includes a heat absorbing end and a heat dissipating end. The heat absorbing end is disposed on the joining part of the cooling base. A flat surface parallel to the heating surface of the cooling base is formed on the heat absorbing end. The heat dissipating end is attached to the heat dissipating component. The design of the present invention effectively reduces the weight and thickness of the cooling base and provides better heat dissipation.



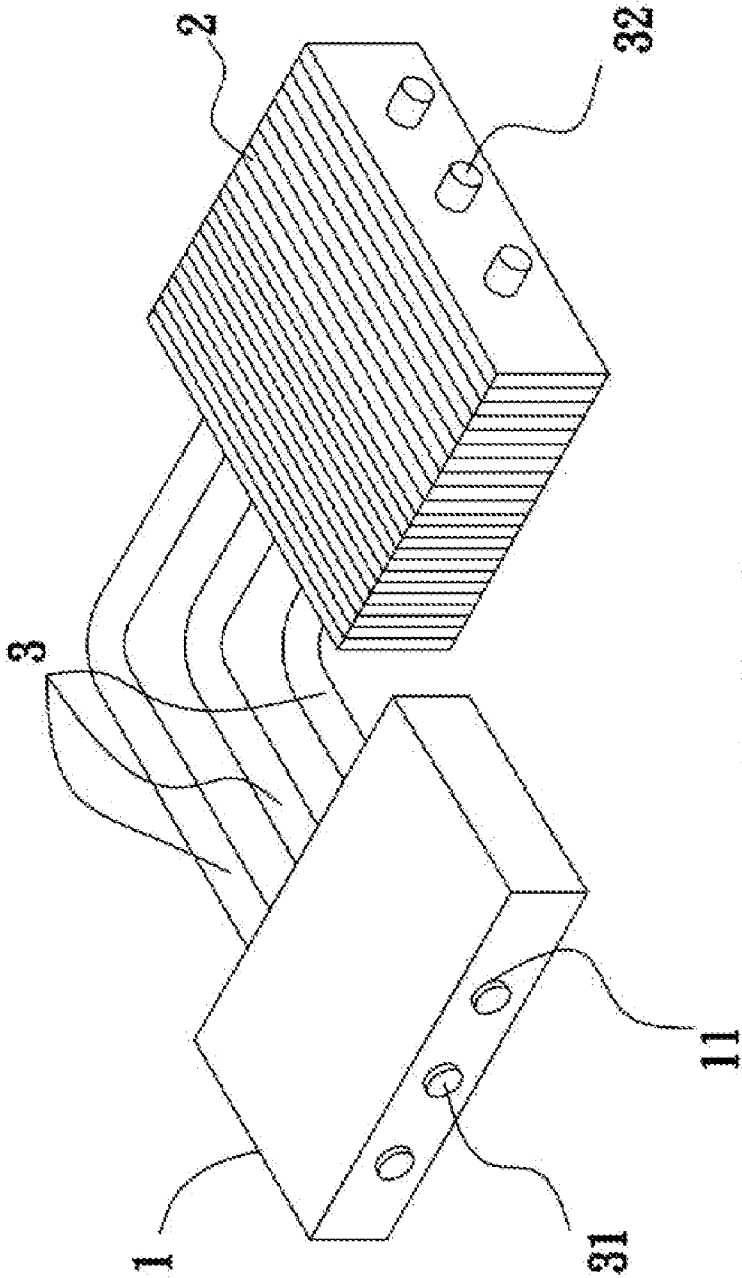


FIG. 1
PRIOR ART

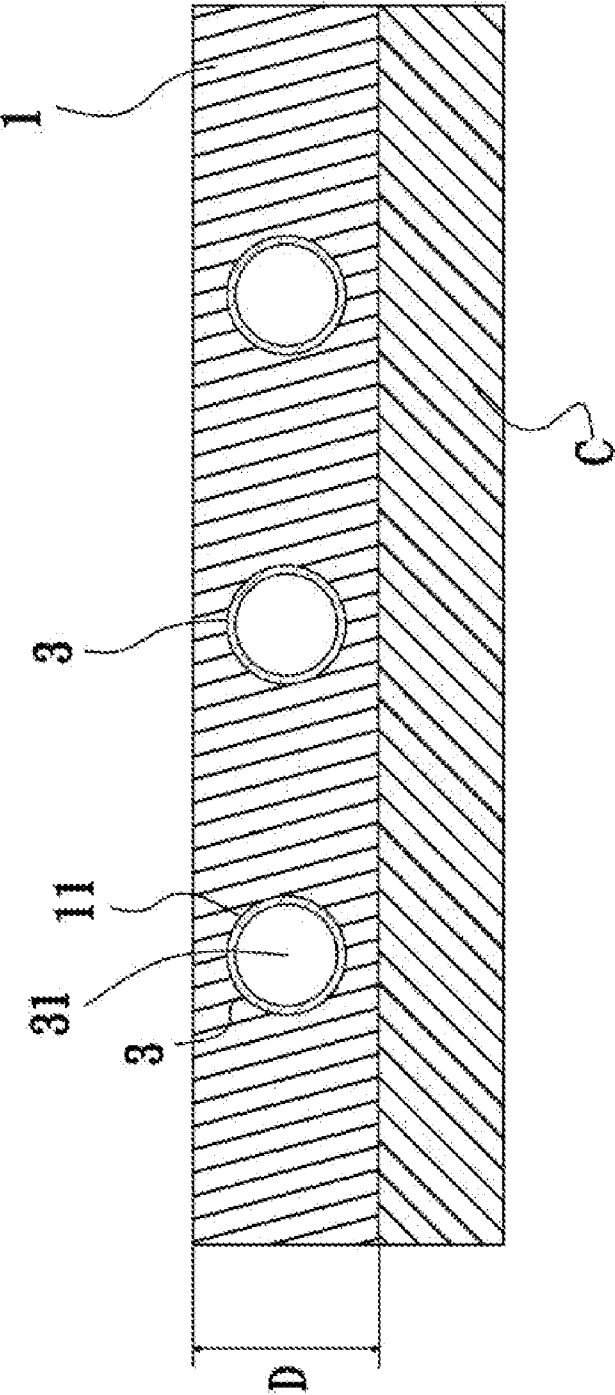


FIG. 2
PRIOR ART

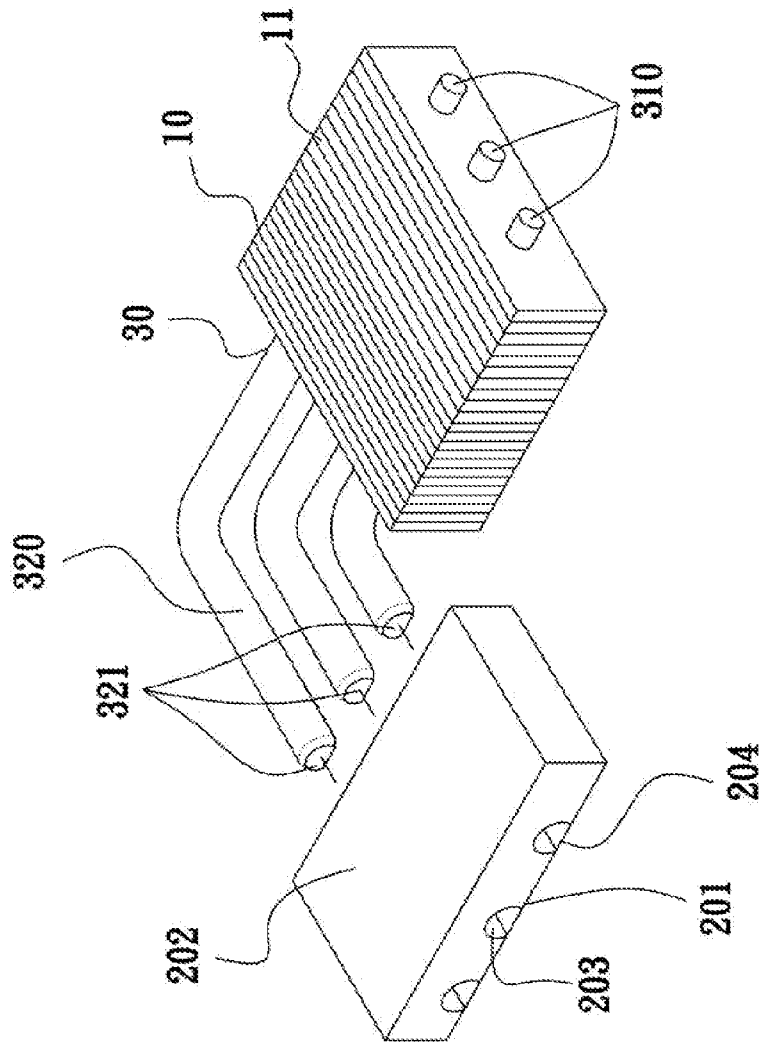


FIG. 3

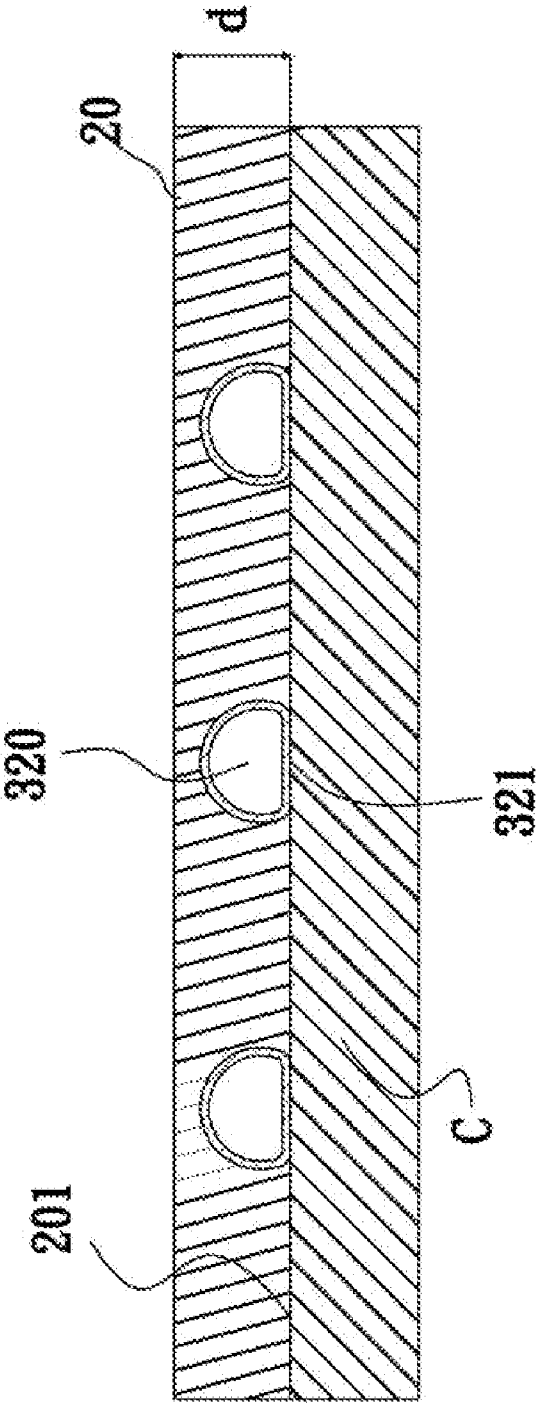


FIG. 4

HEAT DISSIPATION MODULE

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention is related to a heat dissipation module and especially to a heat dissipation module which is cost saving.

[0003] 2. Brief Description of the Related Art

[0004] Electronic parts manufactured nowadays are becoming more and more efficient, light, and thin. But under working condition these electronic parts often generate a great amount of heat and have high heating density. This causes the temperatures of the electronic parts to rise speedily. Without proper heat dissipation, the electronic parts will be overheated and their performance destabilized; the whole electronic devices may consequently stop functioning, crash, or even burn. As the functioning speed of electronic parts is constantly improving, the amount of generated heat increases too. Heat dissipation modules for all kinds of electronic devices are therefore increasingly important to keep electronic parts within normal working temperature range by speedily lowering their high temperature.

[0005] Referring to FIG. 1, a conventional heat dissipation module includes a cooling base 1, a cooling fin set 2, and at least one heat pipe 3. One side of the cooling base directly touches the heating electronic part C. Cut-through slots 11 are disposed on the cooling base 1 to hold and fix the heat pipe 3. The heat pipe 3 includes a heat absorbing end 31 which is connected to the slot 11 and a heat dissipating end 32 which goes through the cooling fin set 2. The heat generated by the electronic part C is absorbed by the cooling base 1, conducted by the heat absorbing end 31 to the heat dissipating end 32, and speedily dissipated through the cooling fin set 2.

[0006] Although the conventional heat dissipation module is efficient in dissipating heat, it has one deficiency in manufacturing. To make a cooling base 1 that is with enough structural strength and that can completely hold and cover the heat pipe 3 of a circular tubal shape, it is required that the overall thickness of the cooling base D be greater than the diameter of the heat pipe 3. The cooling base 1 of the conventional heat dissipation module is therefore thick, heavy, and costly to make.

[0007] In view of the foregoing considerations, a conventional heat dissipation module has the following disadvantages:

[0008] 1. It is costly to make;

[0009] 2. It is thick;

[0010] 3. It is heavy.

[0011] The present invention attempts to reduce the manufacturing cost, thickness, and weight of the conventional cooling base.

SUMMARY OF THE INVENTION

[0012] In order to overcome the deficiencies of the preceding prior art, an object of the present invention is to provide a heat dissipation module which is thinner and lighter. According to the present invention, the heat dissipating module includes a cooling base, a heat dissipating component, and at least one heat pipe. The cooling base includes a heating surface and a conducting surface. On the heating surface is disposed at least one joining part to hold and connect the heat pipe, which includes a heat absorbing end and a heat dissipating end. The heat absorbing end of the heat pipe is dis-

posed on the joining part of the cooling base. A flat surface parallel to the heating surface of the cooling base is formed on the heat absorbing end.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] FIG. 1 is an assembled perspective view of the conventional heat dissipation module;

[0014] FIG. 2 is a side view of the conventional heat dissipation module shown in FIG. 1;

[0015] FIG. 3 is an exploded perspective view of a heat dissipation module with mating holes for semi-circular heat pipes according to the preferred embodiment of the present invention;

[0016] FIG. 4 is a side view of the heat dissipation module with mating holes for semi-circular heat pipes according to the preferred embodiment of the present invention shown in FIG. 3.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT OF THE PRESENT INVENTION

[0017] The foregoing object, structure, and function of the present invention are hereinafter described with reference to its preferred embodiment as shown in FIGS. 3 and 4.

[0018] Referring to FIGS. 3 and 4, a heat dissipation module according to the preferred embodiment of the present invention includes a cooling base 20 and at least one heat pipe 30. The cooling base 20 includes a heating surface 201 and a conducting surface 202 on the opposite side thereof. On the cooling base 20 is disposed at least one joining part 203, which can be in the form of a slot. At least one side thereof is designed as a flat surface 204. The said heating surface 201 is tightly attached to a heating component C (for example a CPU) to dissipate the heat generated by the said heating component C by absorbing and conducting it to heat pipe 30.

[0019] The said heat pipe 30 includes a heat dissipating end 310 and a heat absorbing end 320 thereon at least one flat surface 321 is formed. The said flat surface 321 is attached to the flat surface 204 of the joining part 203 and forms a heat dissipation module.

[0020] In addition, in the present invention the design of a flat surface 321 on the heat absorbing end 320 of the heat pipe 30 reduces the pipe diameter of the heat absorbing end 320, and thereby effectively reduces the thickness of the cooling base D. On the one hand, this design economizes the manufacturing cost and provides excellent heat dissipation. On the other hand, this design effectively simplifies the production process and facilitates the manufacturing of a lighter and thinner cooling base 20.

[0021] Referring again to FIGS. 3 and 4, the foregoing heat dissipation module also includes a heat dissipation device 10 thereon are disposed a plurality of heat dissipating fins 21. The heat dissipating end 310 of the heat pipe 30 goes through the plurality of heat dissipating fins 21 and the two are joined together.

[0022] Further, the foregoing flat surface 204 can be directly disposed on the heating surface 201 of the cooling base 20, and the flat surface 321 on the heat absorbing end 320 of the heat pipe 30 can be exposed in direct contact with the heating component C. This design enlarges the heat contact area and accelerates heat conduction.

[0023] Besides, the flat surface 204 can be designed as parallel to the heating surface 201.

[0024] In view of the foregoing considerations, the present invention has the following advantages over the conventional heat dissipation module:

[0025] 1. It is cost saving;

[0026] 2. It simplifies the production process of heat dissipation modules;

[0027] 3. It provides excellent heat dissipation;

[0028] 4. It reduces the thickness and weight of heat dissipation modules.

[0029] It is to be understood that the form of our invention herein shown and described is to be taken as a preferred example of the same and that various changes in the method, shape, structure, and installation may be resorted to without departing from the spirit of our invention on the scope of the subjoined claims.

What is claimed is:

1. A heat dissipation module comprising:

a cooling base having a heating surface, a conducting surface on the opposite side thereof, and at least one joining part at least one side thereof being designed as a flat surface; and

at least one heat pipe having a heat dissipating end and a heat absorbing end thereon being disposed a flat surface corresponding and attached to the flat surface on the joining part of the cooling base.

2. The heat dissipation module as defined in claim 1, wherein the heat dissipating end of the heat pipe is attached to a heat dissipation device.

3. The heat dissipation module as defined in claim 2, wherein the heat dissipation device includes a plurality of heat dissipation fins.

4. The heat dissipation module as defined in claim 1, wherein the flat surface of the joining part can be disposed directly on the heating surface of the cooling base and wherein the flat surface on the heat absorbing end of the heat pipe is exposed in direct contact with the heating component.

5. The heat dissipation module as defined in claim 4, wherein the flat surface of the joining part can be designed as parallel to the heating surface of the cooling base.

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