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(54) **THERMAL TRANSFER CATALYTIC HEAT DISSIPATION STRUCTURE**

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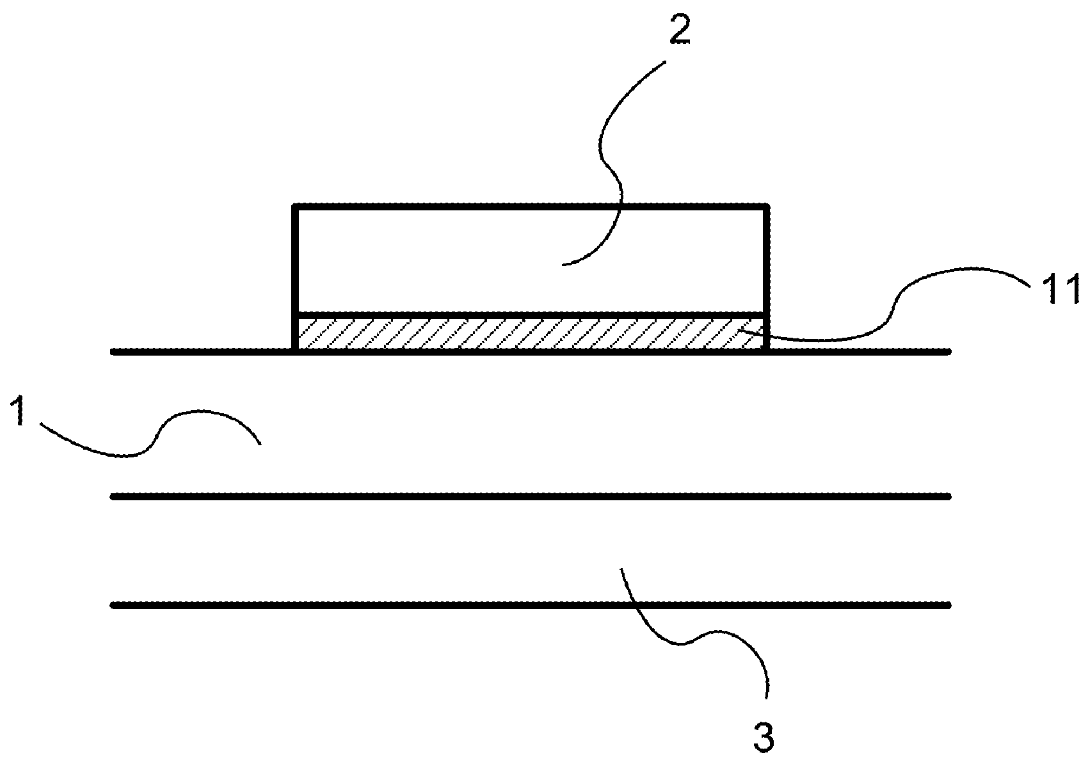
(57) **ABSTRACT**

A thermal transfer catalytic heat dissipation structure is disclosed, which comprises a thermal conductive carrier; a heat source which disposed on a face of the thermal conductive carrier; and a carbon nanoparticles which have hexagonal carbon ring geometry based heat dissipation film, at least disposed on the other face of the thermal conductive carrier. A carbon nanoparticles which have hexagonal carbon ring geometry based heat dissipation film is used to dissipate a heat source when a thermal conductive carrier absorbs the heat from heat source, so that the heat is effectively transferred to the ambient through the film, avoiding a thermal transfer gap with respect to the ambient (like as air).



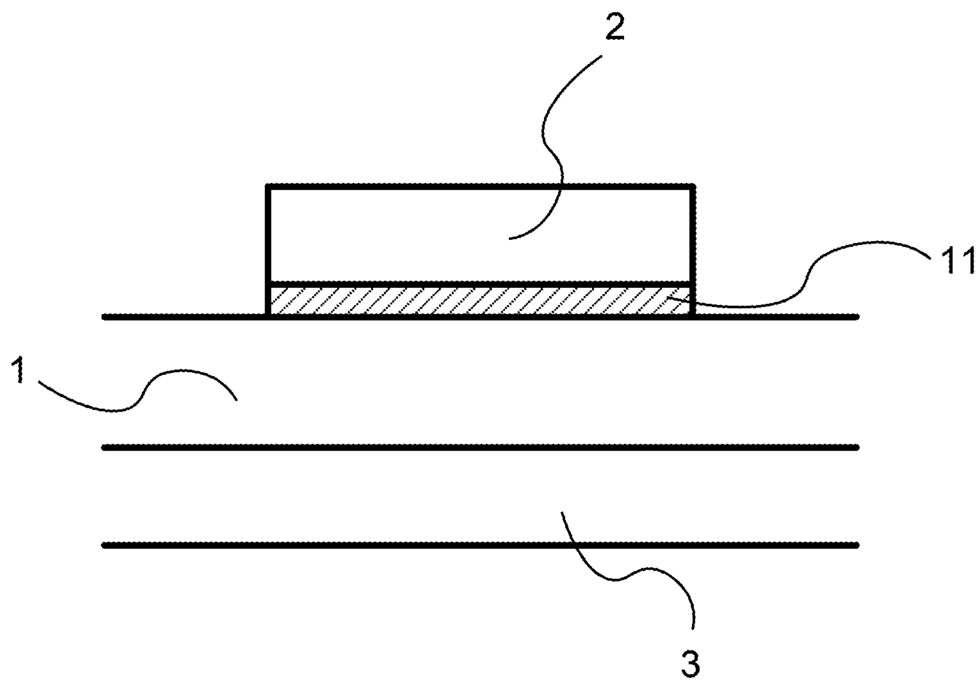


Fig. 1

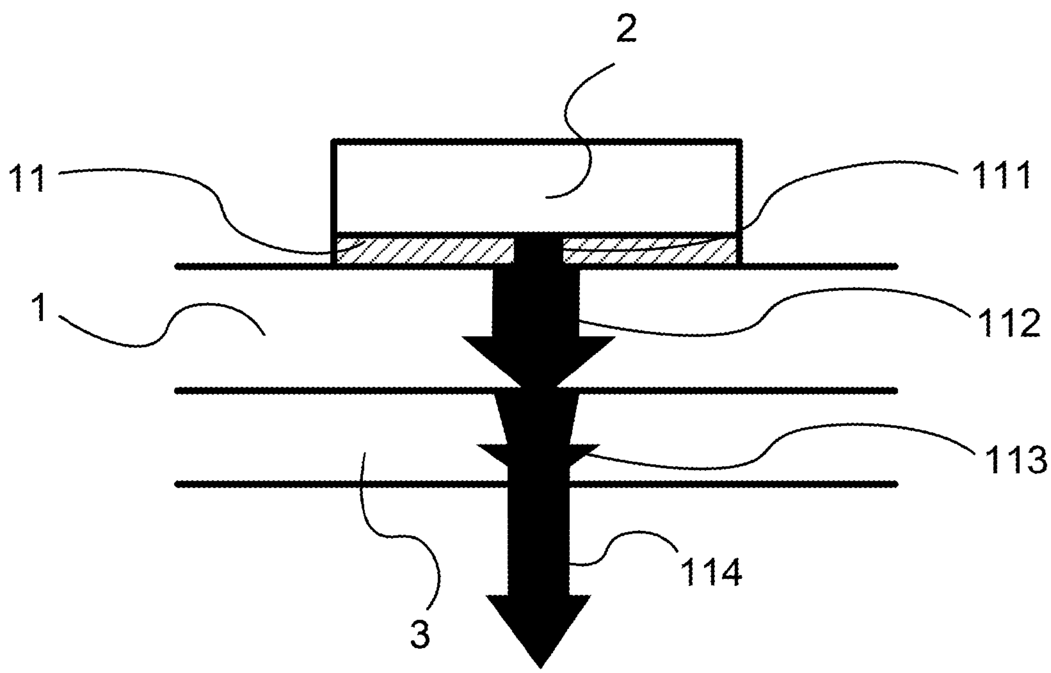


Fig. 2

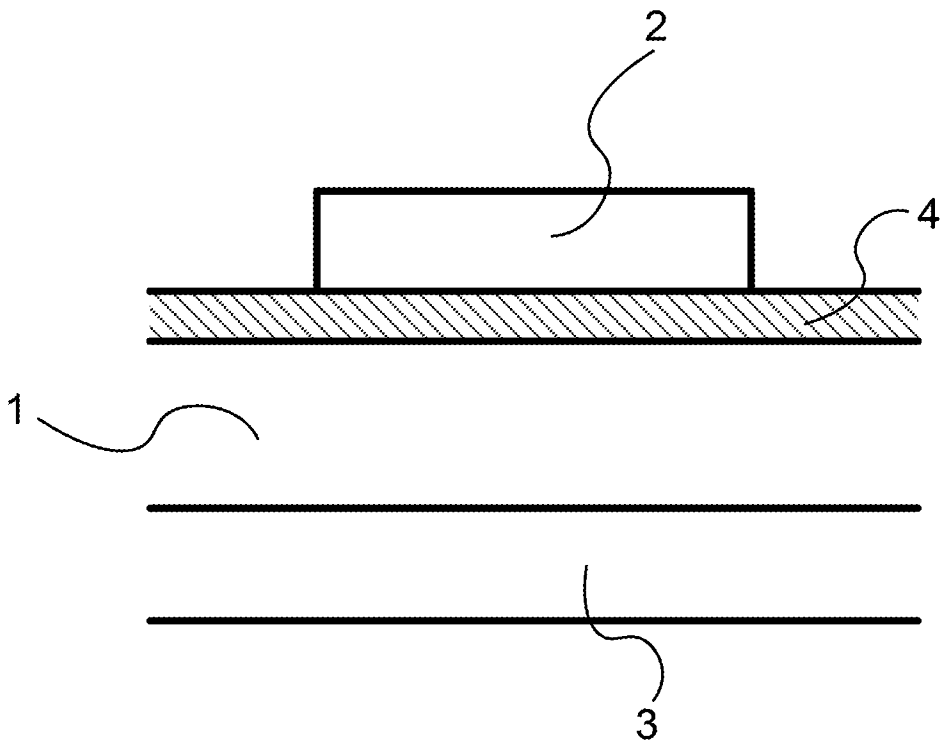


Fig. 3

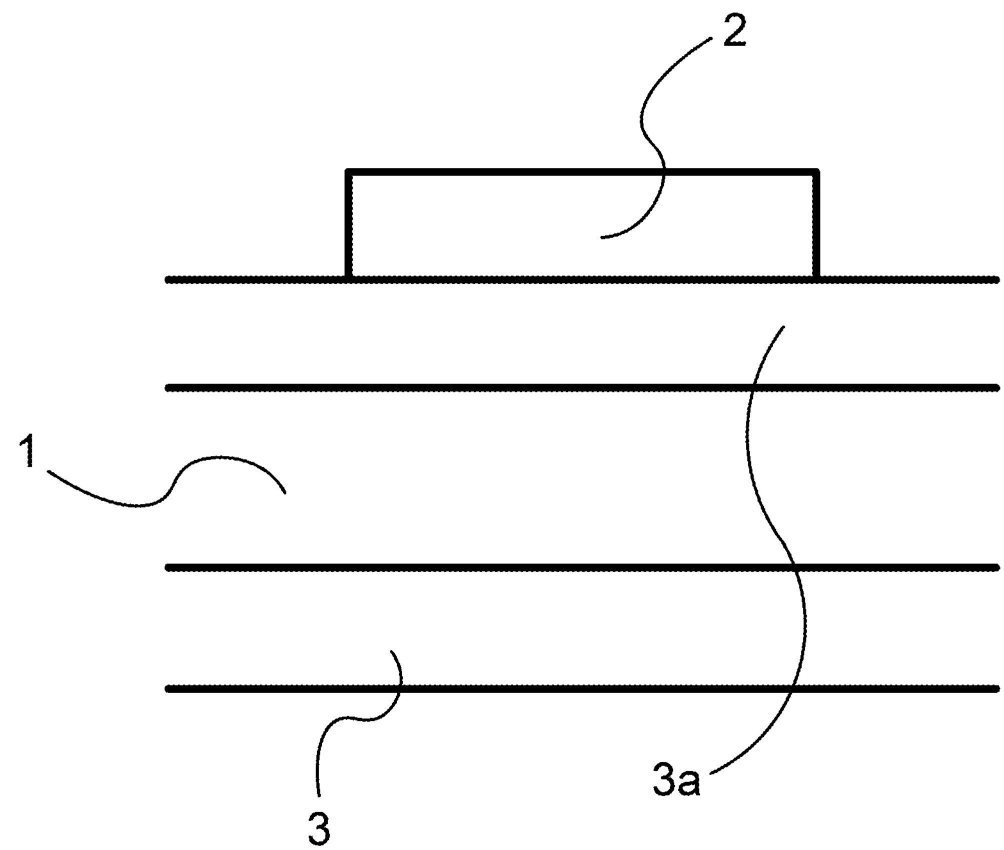


Fig. 4

THERMAL TRANSFER CATALYTIC HEAT DISSIPATION STRUCTURE

FIELD OF THE INVENTION

[0001] The present invention is related to a thermal transfer catalytic heat dissipation structure, and particularly to a thermal transfer catalytic heat dissipation structure where a carbon nanoparticles which have hexagonal carbon ring geometry based heat dissipation film is used to dissipate the heat when a thermal conductive carrier absorbs the heat from heat source, so that the heat source is effectively transferred to the ambient through the film, avoiding a thermal transfer gap with respect to the air, and achieving in that a thermal transfer effectiveness is promoted, a thermal transfer bottleneck is effectively reduced, heat sink is never necessary, a heat dissipation cost is largely reduced, a volume and weight is reduced, and a waste of the raw material, carbon, and energy consumption can be reduced.

DESCRIPTION OF THE RELATED ART

[0002] In a conventional heat dissipation mechanism, a heat dissipation adhesive or high thermal transfer layer is disposed between a thermal conductive carrier and a heat source, and heat sink are further disposed on the thermal conductive carrier, so that the thermal conductive carrier is used to dissipate a heat.

[0003] As far as the conventional heat dissipation mechanism is concerned, since the adhesive has a relatively smaller thermal transfer coefficient, a high heat dissipation insulating layer, having a relatively larger thermal transfer coefficient, is used in replace of the adhesive. However, the bottleneck and barrier of the thermal transfer does not occur on an interface between the heat source and the thermal conductive carrier, but on the contact between the thermal conductive carrier and the ambient (like as air).

[0004] Since there is a very huge thermal transfer gap at the interface between the thermal conductive carrier and the air, i.e. the thermal conductive carrier has a large thermal transfer while the air has a small thermal transfer, a thermal backflow is generated along a thermal transfer path when the heat is transferred to between the thermal conductive carrier and the air through the heat transfer path in the heat sink, although the prior art heat dissipation uses a high heat dissipation insulating layer having a relatively large heat transfer coefficient in replace of the adhesive to promote the thermal transfer efficiency. Thus, the bottleneck and barrier of thermal transfer are formed.

[0005] Therefore, although the high thermal transfer layer disposed between the thermal conductive carrier and the air in the prior art heat dissipation mechanism is helpful for promotion of thermal transfer. It only has a limited result because the thermal transfer bottleneck and barrier are not solved. Therefore, the heat dissipation issue still has to be improved. In addition, the heat sink may also increase the heat dissipation cost, increase the volume and weight of the apparatus, and waste the raw material, except for the above mentioned disadvantages.

[0006] In view of the drawbacks mentioned above, the inventor of the present invention provides a thermal transfer catalytic heat dissipation structure, after many efforts and researches to overcome the shortcoming encountered in the prior art.

SUMMARY OF THE INVENTION

[0007] In a conventional heat dissipation mechanism, a heat dissipation adhesive or high thermal transfer layer is disposed between a thermal conductive carrier and a heat source, and heat sink are further disposed on the thermal conductive carrier, so that the thermal conductive carrier is used to dissipate a heat.

[0008] As far as the conventional heat dissipation mechanism is concerned, since the adhesive has a relatively smaller thermal transfer coefficient, a high heat dissipation insulating layer, having a relatively larger thermal transfer coefficient, is used in replace of the adhesive. However, the bottleneck and barrier of the thermal transfer does not occur on an interface between the heat source and the thermal conductive carrier, but on the contact between the thermal conductive carrier and the air.

[0009] Since there is a very huge thermal transfer gap at the interface between the thermal conductive carrier and the air, i.e. the thermal conductive carrier has a large thermal transfer while the air has a small thermal transfer, a thermal backflow is generated along a thermal transfer path when the heat is transferred to between the thermal conductive carrier and the air through the heat transfer path in the heat sink, although the prior art heat dissipation uses a high heat dissipation insulating layer having a relatively large heat transfer coefficient in replace of the adhesive to promote the thermal transfer efficiency. Thus, the bottleneck and barrier of thermal transfer are formed.

[0010] Therefore, although the high thermal transfer layer disposed between the thermal conductive carrier and the air in the prior art heat dissipation mechanism is helpful for promotion of the thermal transfer. It only has a limited result because the thermal transfer bottleneck and barrier are not solved. Therefore, the heat dissipation issue still has to be improved. In addition, the heat sink may also increase the heat dissipation cost, increase the volume and weight of the apparatus, and waste the raw material, except for the above mentioned disadvantages.

[0011] In view of the drawbacks mentioned above, the inventor of the present invention provides a thermal transfer catalytic heat dissipation structure, after many efforts and researches to overcome the shortcoming encountered in the prior art.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] FIG. **1** is a cross sectional view showing the schematic diagram of the first embodiment according to the present invention;

[0013] FIG. **2** is a schematic diagram of a thermal transfer state of the first embodiment according to the present invention;

[0014] FIG. **3** is a cross sectional view showing the schematic diagram of a second embodiment according to the present invention;

[0015] FIG. **4** is a cross sectional view showing the schematic diagram of a third embodiment according to the present invention;

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0016] Referring to FIG. **1** and FIG. **2**, is a schematic diagram of a cross sectional view showing the schematic diagram of the first embodiment according to the present invention; and a schematic diagram of a thermal transfer state of the first embodiment according to the present invention, respectively.

[0017] As shown, the thermal transfer catalytic heat dissipation structure comprises a thermal conductive carrier **1**, a heat source **2** and a carbon nanoparticles which have hexagonal carbon ring geometry based heat dissipation film **3**.

[0018] The thermal conductive carrier **1** may be but not limited only to a heat dissipation assembly, a fan and a water cooler heat dissipation element.

[0019] The thermal conductive carrier **1** and the heat source **2** are combined with each other through a adhesive **11**. The carbon nanoparticles which have hexagonal carbon ring geometry based heat dissipation film **3** is at least disposed on the other face of the thermal conductive carrier **1**, i.e. the face where the thermal conductive carrier and the air contact to each other. As such, a novel thermal transfer catalytic heat dissipation structure.

[0020] When the present invention is operated, a heat is produced from the heat source **2** and transferred outwards, in which the heat source **2** may be but not only limited to a central processing unit, a graphic chip, LED chip, a solar energy chip, and an internal combustion engine. The heat from the heat source **2** is absorbed by the thermal conductive carrier **1**, and dissipated by the hexagonal carbon ringed carbon heat dissipation film **3**. Since when the heat from the heat source **1** transfers outwards, an thermal transfer path of thermal conductive adhesive **111** has a relatively lower thermal transfer coefficient and thus has relative lowered thermal transfer efficiency. When the heat enters the thermal conductive carrier **1**, a thermal transfer path of thermal conductive carrier **112** of the thermal conductive carrier **1** has relative higher thermal transfer efficiency.

[0021] Since the thermal transfer efficiency in the air is pretty low, highest and lowest thermal transfer efficiency will cause a thermal transfer gap or barrier at the interface between thermal conductive carrier **112** and air.

[0022] The carbon nanoparticles which have hexagonal carbon ring geometry based heat dissipation film **3** of the present invention may overcome effectively the bottleneck or barrier of the thermal transfer between the thermal conductive carrier **1** and the air, i.e. the nano heat dissipation film **113** is effectively used to transferred the heat from thermal conductive carrier **1** to the air, whereby effectively promoting the thermal transfer effect. The thermal transfer path of air after catalyze **114** close to the thermal efficiency of the thermal conductive carrier **1**. Therefore, this heat dissipation mechanism does not require heat sink and thus the heat dissipation cost can be largely reduced. Furthermore, the volume and weight of the structure may be reduced, and a waste of the raw material, carbon, and energy consumption can be reduced.

[0023] Referring to FIG. **3**, a cross sectional view showing the schematic diagram of a second embodiment according to the present invention is shown. As shown, except for the structure mentioned in the first embodiment, the present invention can further have the structure of the second embodiment, and the difference between the second and the first embodiments is that a high heat dissipation insulating layer **4** is combined between the thermal conductive carrier **1** and the heat source **2**

[0024] As such, the heat generated from the heat source **1** is transferred to the thermal conductive carrier **1** through the high heat dissipation insulating layer **4**. After the thermal conductive carrier **1** absorbs the heat source, a carbon nanoparticles which have hexagonal carbon ring geometry based heat dissipation film **3** is used together to dissipate the heat, whereby achieving in the efficacy of promoting the thermal transfer efficiency and effectively reducing thermal transfer bottleneck, similarly.

[0025] Referring to FIG. **4**, a cross sectional view showing the schematic diagram of a third embodiment according to the present invention is shown. As shown, except for the structure mentioned in the first and second embodiments, the present invention can further have the structure of the third embodiment, and the difference of the third and the first embodiments is that a carbon nanoparticles which have hexagonal carbon ring geometry based heat dissipation film **3***a* is combined between the thermal conductive carrier **1** and the heat source **2**.

[0026] As such, the heat generated from the heat source **1** is transferred to the thermal conductive carrier **1** through the first carbon nanoparticles which have hexagonal carbon ring geometry based heat dissipation film **3***a*. After the thermal conductive carrier **1** absorbs the heat source, a second carbon nanoparticles which have hexagonal carbon ring geometry based heat dissipation film **3** is used together to dissipate the heat, whereby achieving in the efficacy of promoting the thermal transfer efficiency and effectively reducing thermal transfer bottleneck, similarly. As such, the present invention can further satisfy a requirement for a practical use.

[0027] The above described is merely examples and preferred embodiments of the present invention, and not exemplified to intend to limit the present invention. Any modifications and changes without departing from the scope of the spirit of the present invention are deemed as within the scope of the present invention. The scope of the present invention is to be interpreted with the scope as defined in the claims.

1. A thermal transfer catalytic heat dissipation structure, comprising:
- a thermal conductive carrier,
- a heat source, disposed on a face of the thermal conductive carrier; and
- a carbon nanoparticles which have hexagonal carbon ring geometry based heat dissipation film, at least disposed on the other face of the thermal conductive carrier.

2. The thermal transfer catalytic heat dissipation structure as claimed in claim **1**, wherein the thermal conductive carrier and the heat source are combined with each other through an adhesive.

3. The thermal transfer catalytic heat dissipation structure as claimed in claim **1**, wherein the thermal conductive carrier and the heat source are combined with each other through a high heat dissipation insulting layer.

4. The thermal transfer catalytic heat dissipation structure as claimed in claim **1**, wherein the thermal conductive carrier comprises a heat dissipation assembly, a fan and a water cooler heat dissipation element.

5. The thermal transfer catalytic heat dissipation structure as claimed in claim **1**, wherein a carbon nanoparticles which have hexagonal carbon ring geometry based heat dissipation film is disposed between the heat source and the thermal conductive carrier.

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