A method of manufacturing an air duct is provided. First, a plastic material is heated until the plastic material is melted. Next, the molten plastic material is sucked into a mold and then the molten plastic material inside the mold is cooled to form the air duct. Finally, the air duct is removed from the mold. The air duct comprises a housing including passage-way for air to flow there-through, a first air inlet/outlet formed on a side thereof, and a joint portion formed on another side thereof corresponding to the first air inlet/outlet to fix to a fan. The joint portion has a second air inlet/outlet. When the fan rotates, airflow is generated, which carries the heat generated by the operation of the devices via the second air inlet/outlet and then exits out via the first air inlet/outlet.
A plastic material is heated until the plastic material is melted.

The molten plastic material is sucked into a mold and the resulting structure is cooled to form the air duct.

The air duct is removed from the mold.

FIG. 1
STRUCTURE OF AIR DUCT AND MANUFACTURING PROCESS OF THE SAME

BACKGROUND OF THE INVENTION

[0001] 1. Field of the invention

[0002] The present invention relates to a structure of an air duct and a manufacturing process of the same. More particularly, the present invention relates to a structure of an air duct comprising a lip portion and joint portion formed two sides thereof such that the reverse flow of the heat may be prevented and the heat dissipating effect may be effectively promoted.

[0003] 2. Description of the Related Art

[0004] The operation of the computer devices usually generate heat, which may significantly increase the temperature and may cause abnormal operation of the devices or even damage the devices. The service life of the devices may be reduced if the heat is not timely dissipated. Accordingly, it is important to dissipate the heat generated by the operation of the devices for proper operation thereof. One way of dissipating heat is by using a heat sink device comprising a fan and an air duct.

[0005] In a conventional heat sink device, the fan is fixed on the air duct using screws and the air duct supports the fan. The air duct is formed by a plastic injection mould process, therefore the air duct has a thick body, which is inconvenient to stack with other components during the transportation. Thus, the air duct must be packaged separately during the transportation. Therefore, the space occupied of the air duct is large and the transportation cost is high. Besides, the fan is fixed on the air duct using screws, which is laborious and time consuming process that would further increase the cost. In addition, the airflow created by the fan may flow in a reverse direction that would adversely affect the heat dissipation effect of the heat sink device. Therefore, it is important to resolve the defects of the conventional heat sink device described above.

SUMMARY OF THE INVENTION

[0006] Accordingly, in the view of the foregoing, the present invention provides a method of manufacturing an air duct capable of reducing its space occupation during the transportation and thereby reduce the transportation cost. According to an aspect of the present invention, first a plastic material is heated until the plastic material melts or softens, and then the softened plastic material is sucked into a mold having a predetermined structure of an air duct. Next, the resulting structure is cooled to form the air duct. Thus, the thickness of the air duct can be thinner than that of the conventional air duct. Furthermore, the air duct of the present invention may be stacked on each other. Thus the space occupied by the air duct can be reduced and the cost of the transportation can also be reduced.

[0007] According to another aspect of the present invention, the fan can be assembled to the air duct using buckles. Thus, not only the structure of the air duct is reinforced but also the defects due to the use of the screws, as required in the conventional air duct, may be avoided. Thus, the throughput may be increased and cost may be substantially reduced.

[0008] According to another aspect of the present invention, the air duct of the present invention comprises lip portion formed in the air inlet/outlet to prevent reverse air flow to effectively promote the heat dissipation effect.

[0009] According to another aspect of the present invention, a process of manufacturing the air-duct is provided. The process of manufacturing the air duct according to an embodiment of the present invention comprises the following steps. At step S1, the plastic material is heated until the plastic material is melted. Next, at step S2, the molten plastic material is sucked into a mold and then the resulting structure is cooled to form the air duct. Next, at step S3, the air duct is removed from the mold. The air duct comprises a housing including passageways for air to flow, a first air inlet/outlet formed on a side thereof, and a joint portion formed on another side corresponding to the first air inlet/outlet for fixing to the fan. The joint portion comprises a second air inlet/outlet. When the fan rotates, airflow is generated. The airflow carries heat generated by the operation of the devices and enters via the second air inlet/outlet, and then exits to outside via the first air inlet/outlet.

BRIEF DESCRIPTION OF THE DRAWING

[0010] For a more complete understanding of the present invention, reference will now be made to the following detailed description of preferred embodiments taken in conjunction with the following accompanying drawings.

[0011] FIG. 1 is a flowchart illustrating a manufacturing process of an air duct according to an embodiment of the present invention.

[0012] FIG. 2 is a perspective view of an air duct according to an embodiment of the present invention.

[0013] FIG. 3 is an exploded view showing the air duct and a fan according to an embodiment of the present invention.

[0014] FIG. 4 is a perspective view of the air duct and a fan according to an embodiment of the present invention.

[0015] FIG. 5 is an air duct and a fan according to another embodiment of the present invention.

DETAIL DESCRIPTION OF THE INVENTION

[0016] FIG. 1 is a flowchart illustrating a manufacturing process of an air duct according to an embodiment of the present invention. Referring to FIG. 1, at step S1, the plastic material is heated until the plastic material is melted. Next, at step S2, the molten plastic material is sucked into a mold and then the resulting structure is cooled to form the air duct. Next, at step S3, the air duct is removed from the mold. The thickness of the air duct can be thinner than that of the conventional air duct. Furthermore, the air duct of the present invention may be stacked on each other, just like stacking the paper cups as shown in FIG. 2. Thus the storage space of the air duct can be substantially reduced and the transportation cost can also be substantially reduced.

[0017] FIG. 3 is an exploded view showing the air duct and a fan according to an embodiment of the present invention. FIG. 4 is a perspective view of the air duct and a fan according to an embodiment of the present invention. Referring to FIG. 3 and 4, the air duct comprises least a housing I suitable to be positioned over a heating element, for example, an electronic device, a heat dissipating propel-ler (not shown). The housing I comprises a passageway for air to flow there-through. The housing I comprises a first air inlet/outlet 11 formed on a side thereof, and a joint portion 12 formed on another side corresponding to the first air
inlet/outlet 11 for fixing to a fan 2. The joint portion 12 surrounds a second air inlet/outlet 121 of the air duct. The fan 2 may be positioned above a heating element, for example a CPU, a heat dissipating blade or the like. When the fan 2 rotates, airflow is generated and the heat generated due to the operation of the heating-element is guided into the second air inlet/outlet 121 and then exited to outside via the first air inlet/outlet 11 as depicted in FIG. 5, where it is shown the air flows from side A to side A’ and vice versa. That is, alternatively, the air may also be made to flow from side A’ to side A due to the rotation of the fan 2 to suck or draw cooler air from outside and blow it on the heating element and thereby dissipate the heat generated due to the operation of the heating element.

[0018] The fan 2 is fixed on the housing 1 by buckling the frame 21 of the fan 2 to the joint portion 12. According to an embodiment of the present invention, the housing 1 comprises a second air inlet/outlet 121 formed in an indented portion of a side thereof on which the fan 2 may be positioned. The non-indented portion or the edge portion of the housing 1 surrounding the second air inlet/outlet 121 comprises a plurality of protruding buckles 120 that collectively form the joint portion 12, and the function of the joint portion 12 has already been described in the preceding paragraph. Thus, the assembly throughput may be increased and the overall cost of the air duct is reduced.

[0019] FIG. 5 shows an air duct according to another embodiment of the present invention. Referring to FIG. 5, the first air inlet/outlet 11 of the housing 1 comprises an outwardly inclined or expanded lip portion 110. The lip portion 110 prevents the air from flowing in a reverse direction. Thus, the heat dissipation effect of the fan 2 and the air duct can be effectively promoted.

[0020] While the invention has been described in conjunction with a specific best mode, it is to be understood that many alternatives, modifications, and variations will be apparent to those skilled in the art in light of the foregoing description. Accordingly, it is intended to embrace all such alternatives, modifications, and variations in which fall within the spirit and scope of the included claims. All matters set forth herein or shown in the accompanying drawings are to be interpreted in an illustrative and non-limiting sense.

What is claimed is:
1. A method of manufacturing an air duct, comprising:
   heating a plastic material until the plastic material is melted;
sucking the molten plastic material into a mold comprising a predetermined structure of the air duct and cooling the molten plastic material inside the mold to form the air duct; and
removing the air duct from the mold.
2. A structure of an air duct formed according to the method as claimed in claim 1, wherein said air duct comprises at least a housing including a first air inlet/outlet formed on a side thereof, and a joint portion formed on another side thereof, and wherein said joint portion comprises a plurality of protruding buckles.
3. The structure of an air duct according to claim 2, wherein said joint portion is buckled to a fan.
4. The structure of an air duct according to claim 2, wherein said housing comprises a second air inlet/outlet formed in an indented portion of said housing on which a fan is mounted thereon.
5. The structure of an air duct according to claim 4, wherein said housing comprises a plurality of protruding buckles to collectively form the joint portion.
6. A structure of an air duct comprising at least a housing including a first air inlet/outlet formed on a side thereof; and a plurality of protruding buckles formed on another side thereof to collectively form a joint portion, wherein said joint portion surrounds a second air inlet/outlet.
7. The structure of an air duct according to claim 6, wherein said joint-portion is adopted for buckling to a fan.

* * * * *