The invention relates to a blade wheel, which includes a hub having a circular end face on the topside and a sidewall formed by extending downwardly from the outer periphery of the hub, a spindle vertically connected at a center beneath said circular end face, a plurality of blades disposed on the outer periphery of the side wall, a permanent magnet disposed on the inner periphery of the side wall, and a plurality of magnets or permeable components disposed on the circular end face of the hub. By means of the magnetic attraction and mutual traction, the driven element inside the cooled part is driven to synchronously rotate along with the hub, not only dissipating the heat of the cooled part, but also achieving dual effects inclusive of heat dissipation and power driving by means of the power supplied by the traction through the magnet or the permeable component.
BLADE WHEEL STRUCTURE

FIELD OF THE INVENTION

[0001] The invention relates to a blade wheel structure, which is disposed on a cooling device and featured by dissipating heat and driving power at the same time to provide a more effective cooling structure.

BACKGROUND OF THE INVENTION

[0002] As shown in Appendix 1, Taiwan Patent Publication No. M252992 “Water-cooling system” is applied to a heating electronic component including a cooling foundation 1, a water pump 3, a first cooling base 4 and a second cooling base 5.

[0003] The mentioned parts are connected with a cycling pipeline 2 to form a closed loop for circulating low-temperature liquid. The water pump 3 is the power source driving the low-temperature liquid to circulate so that the low-temperature liquid continuously circulates through all parts to perform heat exchange.

[0004] Besides, the cooling foundation 1 is disposed on a heating electronic component. The first cooling base 4 and the second cooling base 5 are disposed two heat sinks (41, 51) and two cooling fans (42, 52) thereon respectively. The heat sinks (41, 51) absorb the heat from the first cooling base 4 and the second cooling base 5. The cooling fans (42, 52) assist to dissipate the heat absorbed by the heat sinks (41, 51) so as to achieve the circulating and cooling effect.

[0005] Whereas, such conventional water-cooling cooling system is barely in volume production and retailed simply because of the numerous parts, bulky size, high production cost and the most critical reason that fails to integrate the entire power.

[0006] The power owned the water-cooling system comes from the cooling fans (42, 52) and the water pump 3. The cooling fans (42, 52) are featured by assisting the heat sinks (41, 51) to dissipate heat while the water pump is featured by driving the low-temperature liquid, signifying that the functions of both parts are mutually independent.

[0007] Perhaps because the cooling fans 42 and 52 and the water pump 3 all have their independently-own power, it winds out with rather complicated and plentiful parts to integrate the water-cooling system, bulky size and relatively high production cost.

[0008] Consequently, if the power owned by the cooling fan and the water pump can be unified and simplified as a whole, the size of the water-cooling system can be further reduced, so can the production cost.

SUMMARY OF THE INVENTION

[0009] In view of this, the invention thus provides a blade wheel structure enabling to simultaneously dissipate heat and drive power, which simplifies the composition of the cooling module, reduces the entire size, saves production cost, and provides the more effective cooling effect.

[0010] The blade wheel structure includes a hub having a circular end face on the top side of the hub and there is a spindle vertically connected at a center beneath the circular end face. A circular sidewall extending downwardly from the circular end face is disposed a plurality of blades thereon. There is a permanent magnet disposed inside the sidewall. Permeable components are disposed on the circular portion of the hub.

[0011] When the driven element inside the cooled part is also disposed a magnet or a permeable component, the driven element is driven by means of the magnetic attraction and mutual traction so as to synchronously rotate along with the hub. Therefore, when the blade wheel rotates, on the one hand, the heat absorbed by the cooling part is rapidly dissipated, on the other hand, the power required to rotate the driven element is supplied at the same time so that the blade wheel is capable of dissipating heat and driving power simultaneously, attaining the goal of the power integration and resulting in a faster and better cooling effect.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] FIG. 1 is an exploded view showing the cooling fan;

[0013] FIG. 2 is an external schematic view showing the first-type blade wheel structure pattern;

[0014] FIG. 3 is an external schematic view showing the second-type blade wheel structure pattern;

[0015] FIG. 4 is an external schematic view showing the third-type blade wheel structure pattern;

[0016] FIG. 5 is an exploded schematic view showing the preferred embodiment of the present invention;

[0017] FIG. 6 is a cross-sectional schematic view showing the heat sink implemented in the present invention;

[0018] FIG. 7 is an exploded schematic view showing the water pump implemented in the present invention; and

[0019] FIG. 8 is a cross-sectional schematic view showing the water pump implemented in the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0020] The invention relates to a blade wheel structure, which includes a hub having a circular portion on the top end face disposed magnets or permeable components. When the driven element inside the cooled part is also disposed magnets or permeable components, the driven element is driven by means of the magnetic attraction and mutual traction so as to synchronously rotate along with the hub. Hence, while the blade wheel is rotating, firstly, the heat of the cooled part is dissipated by the air flow driven the blades disposed on the outer periphery of the hub, secondly, the magnets or the permeable components disposed on the top end face of the hub synchronously drive and provide the power required to run the driven part, achieving the dual effects of the heat dissipation and the power driving.

[0021] Several preferred embodiments, together with figures, are listed below as examples illustrative of the relevant positions of the parts composing the present invention.

[0022] As shown in FIG. 1, the cooling fan 61 is composed of a frame 61, a stator 62 and a blade wheel 63, wherein the frame 61 has a shaft tube base therein supported by a plurality of ribs, the shaft tube base has the stator 62
disposed and fixed thereon, and the blade wheel is disposed to corresponds to the stator 62.

[0023] Together with the reference to FIG. 2, the blade wheel contains a hub 64. The hub 64 has a circular flat end face on the topside. The bottom portion of the flat end face is connected with a spindle 67 at the center. A sidewall is formed by extending downwardly from the outer perimeter of the flat end face. A plurality of blades 65 are disposed on the outer periphery of the sidewall and a permanent magnet 66 is disposed inside the inner periphery. The circular portion on the topside of the hub 64 is disposed a permeable component 641. The permeable component 641 are a magnet or a metal with permeable characteristics, and the permeable component 641 and the hub 64 can be fastened by any one of the sticking means, the engaging means and the inserting means.

[0024] As shown in FIG. 2, the permeable component 641 includes magnets having at least two different polarities and taking a shape of a sector plate. The permeable component 641 is fixed on the hub 64 by the sticking means. Besides, the permeable component 641 can be a single-piece annular magnet having the magnetic poles with at least two polarities.

[0025] As shown in FIG. 3, the permeable component 642 is a single-piece annular permeable metal. The hub has a plurality of clips 643 disposed on the outer edge of the topside of the hub 64 so as to fasten the permeable component 642 on the hub 64.

[0026] As shown in FIG. 4, the hub 64 has at least two positioning slots 645 located on the outer edge of the topside of the hub 64. The positioning slot 645 allows the permeable component 644 to be inserted in the positioning slot and fastened on the hub 64.

[0027] Moreover, FIG. 5 and FIG. 6 illustrate the preferred embodiment of the heat sink applied in the present invention.

[0028] The heat sink 21 includes a central heat conducting body 22. A plurality of cooling fins 23 extending outwardly from the periphery on the central conducting body 22. The central heat conducting body 22 has a through-hole penetrating one side thereof. The opening of the through-hole is enclosed by a cover plate 24 so as to form a fully-sealed hollow chamber 221. The chamber is filled with a cooling liquid and is disposed an agitator 25 therein. The agitator 25 has a permeable component 251 corresponding to a permeable component 641 disposed therein. The two permeable components 251, 641 have the magnetic attraction and mutual traction therebetween so that the agitator 25 can synchronously rotate along with the hub 64.

[0029] During implementation, the heat sink 21 directly contacts with the heating element to absorb the heat thereof. The cooling fan 6 is disposed on the heat sink 21 to dissipate the heat thereof. As such, when the blade wheel rotates, the blades on the outer periphery of the hub 64 drive the airflow to dissipate the heat of the cooling fins 23 on the heat sink 21. Meanwhile, the permeable component 641 on the hub 64 pulls the agitator 25 to provide the power required for the agitator 25 and the hub 64 to synchronously rotate so as to agitate the cooling liquid filled in the chamber 221, attaining the dual effects inclusive of heat dissipation and power driving.

[0030] FIG. 7 and FIG. 8 illustrate the preferred embodiment of water pump applied in the present invention.

[0031] The topside of the water pump 31 is covered by a cover plate 31 so as to enclose an inner space 311. The inner space 311 is connected with an inlet tube 312 and an outlet tube 313 respectively. The water pump 31 has a plurality of cooling fins 33 extending from the outer periphery thereof, and an active gear 34 is housed in the inner space 311. The active gear 34 is disposed a permeable component 341 corresponding to the permeable component 641 disposed on the hub so that the magnetic attraction and mutual traction exist between the two permeable components, allowing to synchronously rotate the active gear 34 and the hub 64.

[0032] During implementation, the water pump 31 drives the cooling liquid to flow. The cooling fan 6 is disposed on the water pump 31 to assist the heat dissipation thereof. As a result, when the blade wheel 63 rotates, the blades on the outer periphery of the hub 64 drive the airflow to dissipate the heat of the cooling fins on the hub 64. Using the permeable components 641 on the hub 64 to drive the active gear 34 and providing the active gear 34 the power for synchronously rotating along with the hub 64 to drive the cooling liquid for circulation, the dual effects for dissipating heat and driving power are attained.

[0033] In sum, the blade wheel of the present invention, attributable to the characteristics of the magnetic attraction and the mutual traction, drives the driven element inside the cooled part to synchronously rotate along with the hub. Hence, when the blade wheel rotates, on the one hand, the blades disposed on the outer periphery of the hub drive the airflow to dissipate the heat of the cooled part, on the other hand, the magnets or permeable components disposed on the top end face of the hub synchronously draw the driven element and provide the required power to rotate the driven element so as to enable the blade wheel to have dual effects in dissipating heat and driving power, achieving the goal of the power integration and the faster and better heat dissipation effect. Therefore, the present invention not only has a novelty and a progressiveness, but also has an industry utility.

[0034] While the invention has been described in terms of what is presently considered to be the most practical and preferred embodiments, it is to be understood that the invention needs not be limited to the disclosed embodiments. On the contrary, it is intended to cover various modifications and similar arrangements included within the spirit and scope of the appended claims, which are to be accorded with the broadest interpretation so as to encompass all such modifications and similar structures.

What is claimed is:

1. A blade wheel structure, comprising:
a hub having a circular end face on a top side of said hub and a sidewall formed by extending downwardly from a perimeter of said circular end face;
a spindle vertically connected at a center beneath said circular end face;
a plurality of blades disposed on an outer periphery of said sidewall;
a permanent magnet disposed on an inner periphery of said sidewall; and
a plurality of permeable components disposed on said circular end face.

2. The blade wheel structure of claim 1, wherein said plurality of permeable components are located on an annular periphery surrounding an axis traversing said spindle.

3. The blade wheel structure of claim 1, wherein said permeable components are stuck on said hub.

4. The blade wheel structure of claim 1, wherein said circular end face is disposed a plurality of clips for fastening said plurality of permeable components.

5. The blade wheel structure of claim 1, wherein said circular end face is disposed at least two positioning slots for said plurality of permeable components to be inserted therein and fastened on said hub.

6. The blade wheel structure of claim 1, wherein said plurality of permeable components are in form of single-piece magnet having at least two polarities.

7. The blade wheel structure of claim 1, wherein said plurality of permeable components are in form of a sector plate having at least two polarities.

8. The blade wheel structure of claim 1, wherein said plurality of permeable components are in form of a metal with permeability.

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