



US 20160290365A1

(19) **United States**

(12) **Patent Application Publication**
ZHU et al.

(10) **Pub. No.: US 2016/0290365 A1**

(43) **Pub. Date: Oct. 6, 2016**

(54) **FAN AND FAN ASSEMBLY**

Publication Classification

(71) Applicants: **HONG FU JIN PRECISION INDUSTRY (WuHan) CO., LTD.**, Wuhan (CN); **HON HAI PRECISION INDUSTRY CO., LTD.**, New Taipei (TW)

(51) **Int. Cl.**
F04D 29/62 (2006.01)
F04D 29/42 (2006.01)
F04D 13/06 (2006.01)
(52) **U.S. Cl.**
CPC *F04D 29/624* (2013.01); *F04D 13/06* (2013.01); *F04D 29/4226* (2013.01)

(72) Inventors: **HAI-FENG ZHU**, Wuhan (CN); **LI WANG**, Wuhan (CN); **YA-QIN WANG**, Wuhan (CN); **DUN-JUN ZHOU**, Wuhan (CN)

(57) **ABSTRACT**

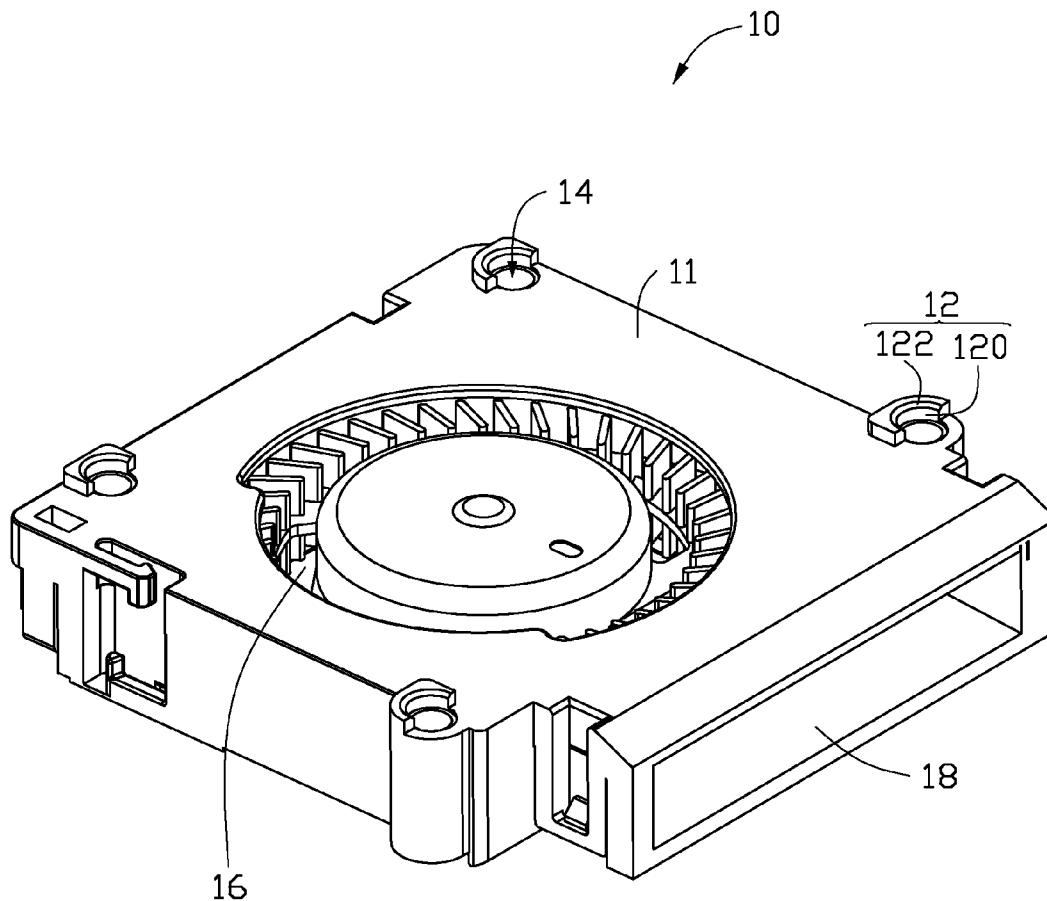
(21) Appl. No.: **14/691,032**

(22) Filed: **Apr. 20, 2015**

(30) **Foreign Application Priority Data**

Mar. 31, 2015 (CN) 201510146970.7

A fan defines a plurality of fixing holes and includes a plurality of protrusions. The plurality of protrusions is located on sides of the plurality of fixing holes. Each protrusion includes a guiding surface. The plurality of guiding surface extends in the plurality of fixing holes. A fan assembly is also provided.



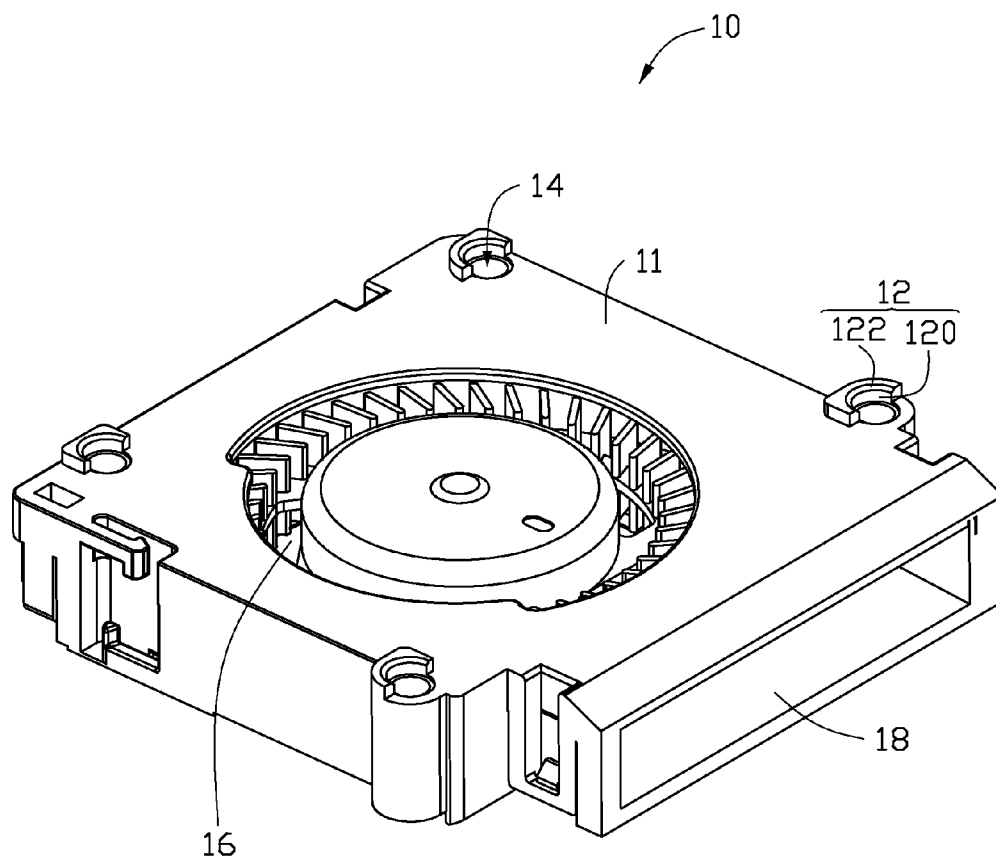


FIG. 1

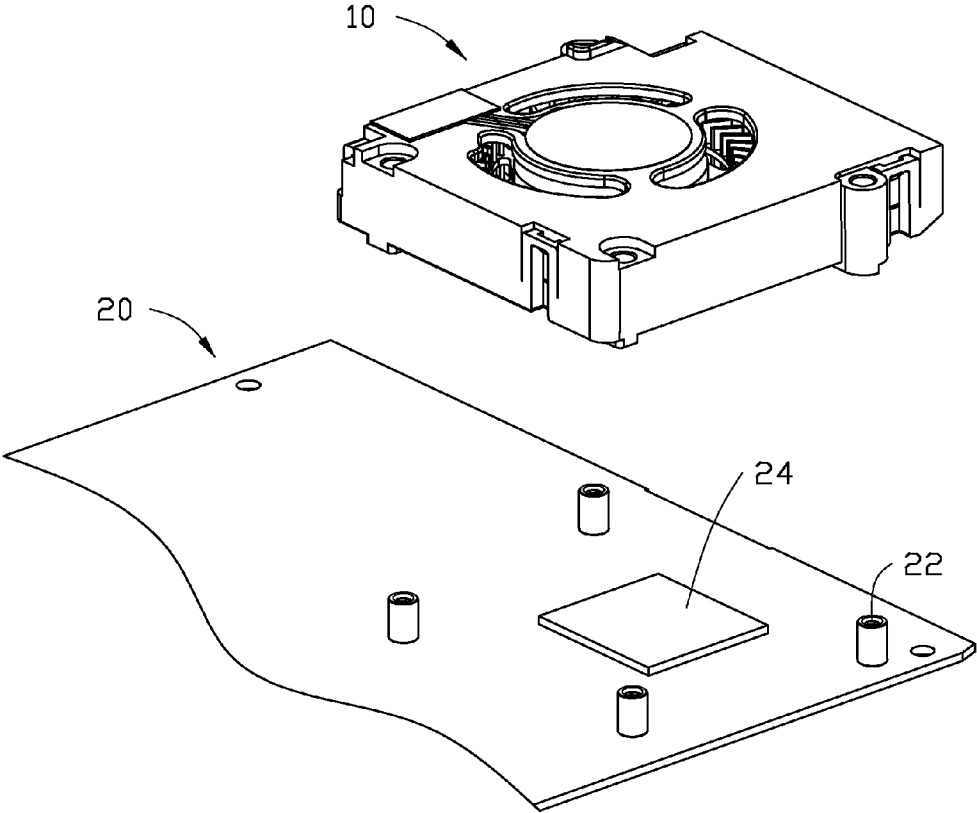


FIG. 2

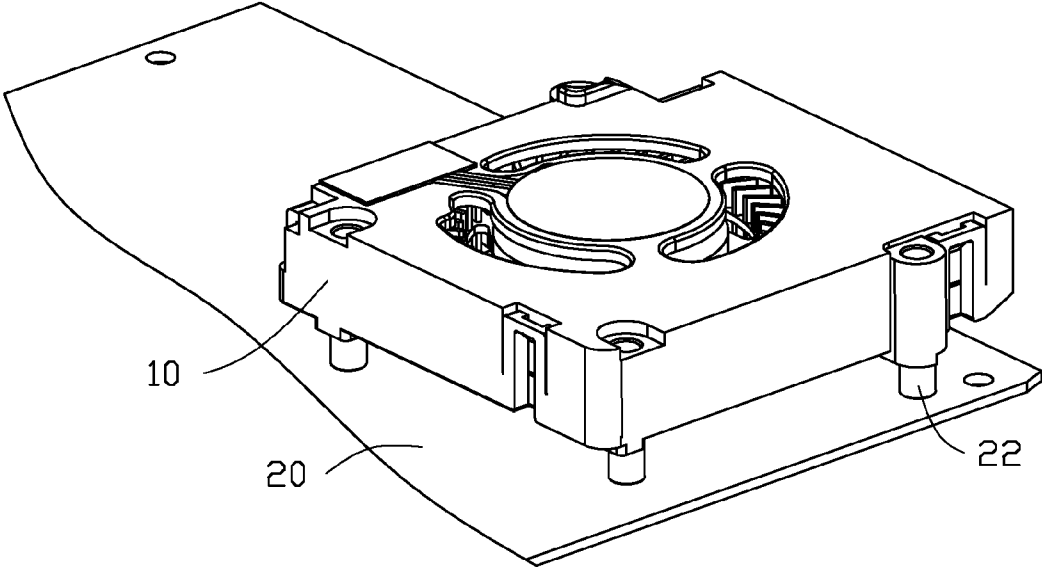


FIG. 3

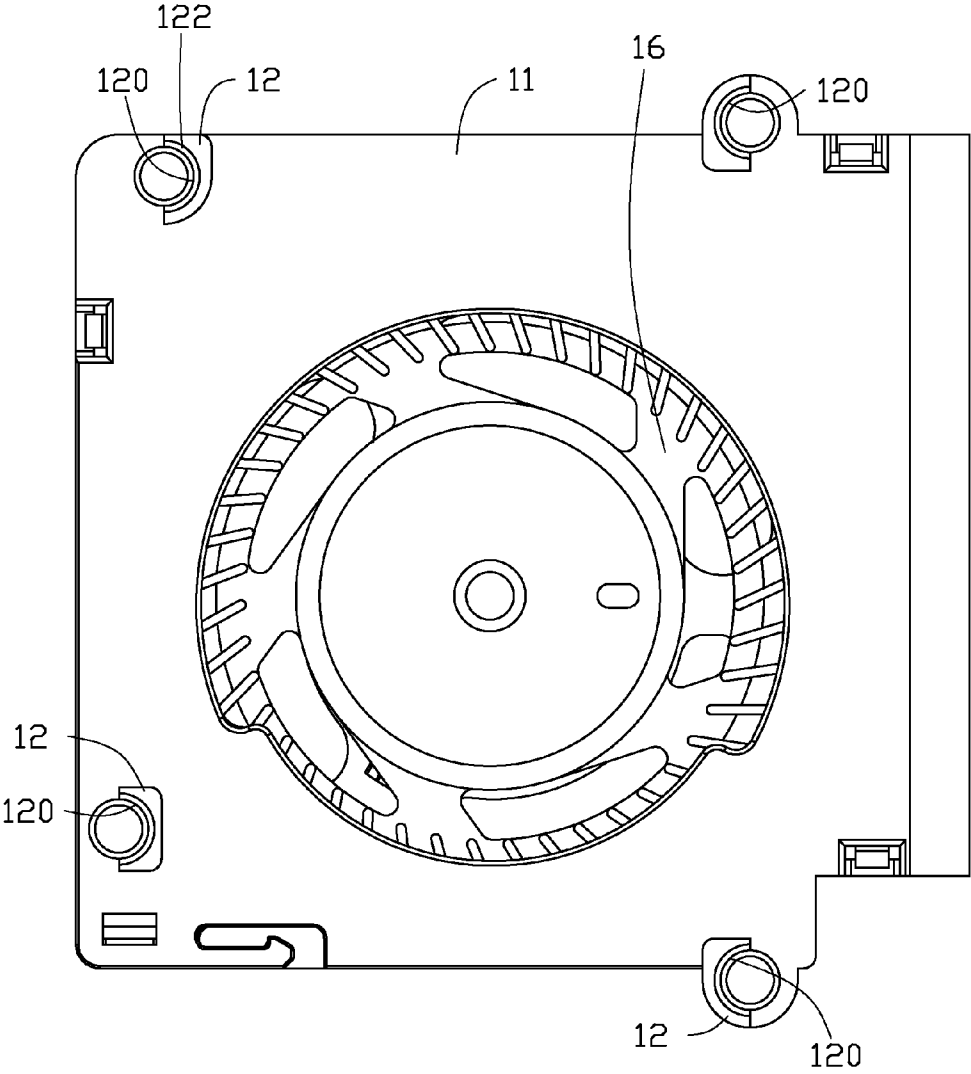


FIG. 4

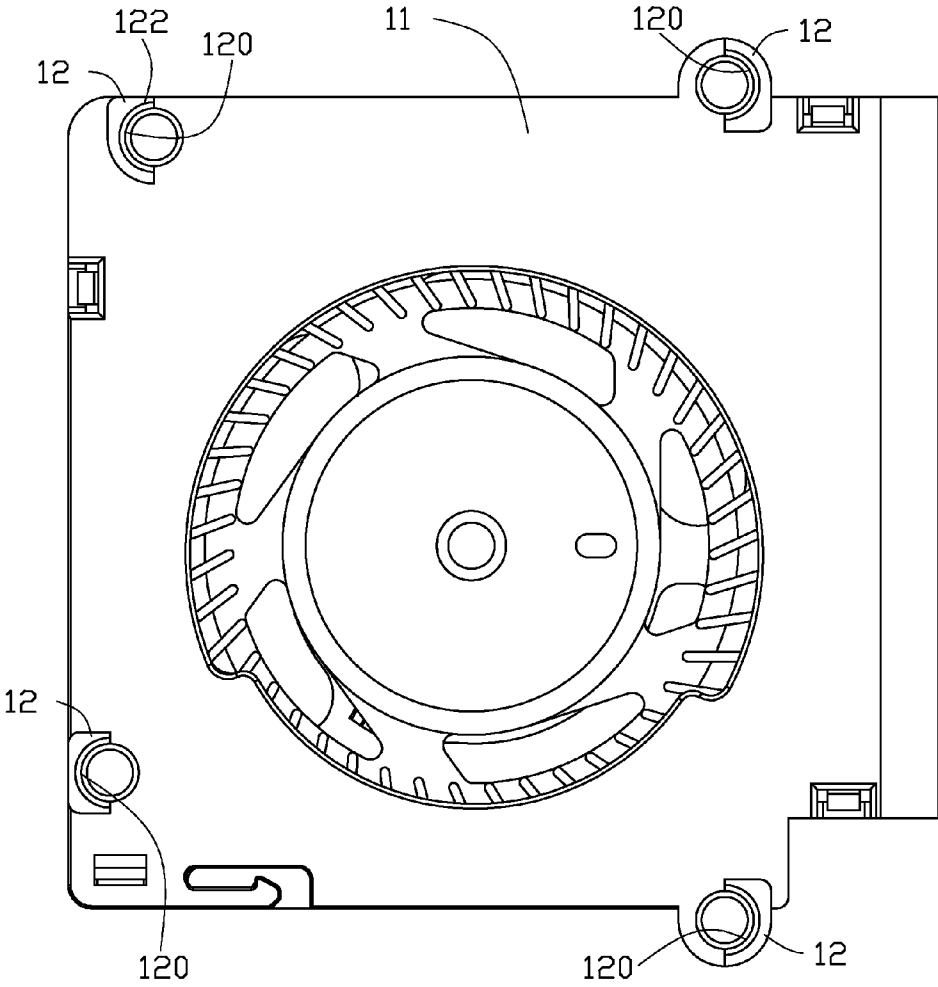


FIG. 5

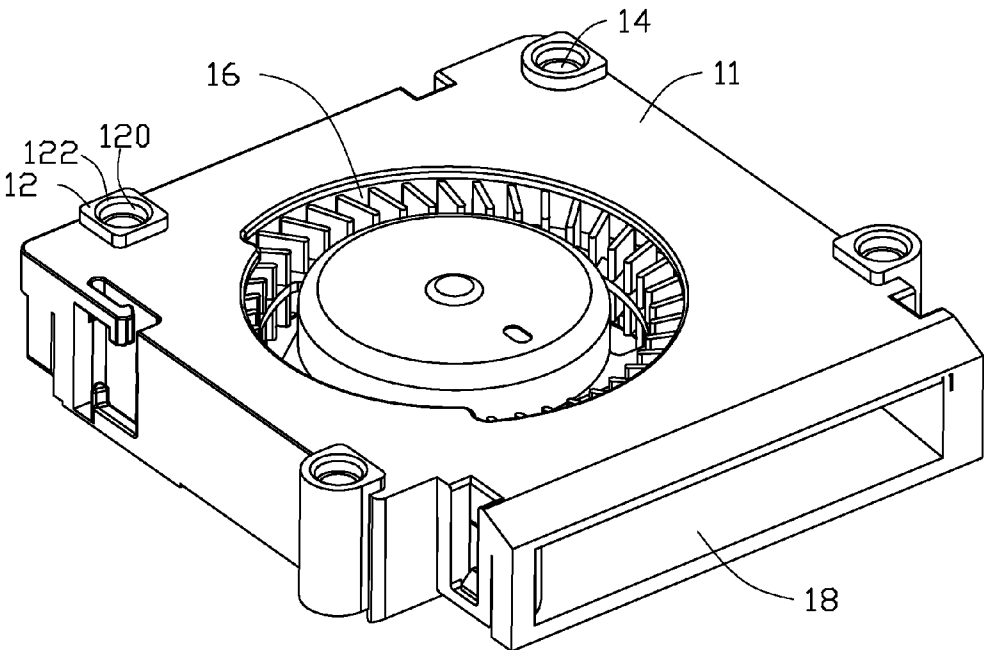


FIG. 6

FAN AND FAN ASSEMBLY

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to Chinese Patent Application No. 201510146970.7 filed on Mar. 31, 2015, the contents of which are incorporated by reference herein.

FIELD

[0002] The subject matter herein generally relates to a fan and a fan assembly.

BACKGROUND

[0003] When electronic devices are in a working state, microprocessors can generate heat. If the heat is not dissipated in time, the electronic devices will be damaged.

BRIEF DESCRIPTION OF THE DRAWINGS

[0004] Implementations of the present technology will now be described, by way of example only, with reference to the attached figures.

[0005] FIG. 1 is an isometric view of a first embodiment of a fan.

[0006] FIG. 2 is an assembly view of the fan of FIG. 1 being installed on a circuit board.

[0007] FIG. 3 is an isometric view of the fan of FIG. 1 being mounted to the circuit board.

[0008] FIG. 4 is a top plan view of a second embodiment of a fan.

[0009] FIG. 5 is a top plan view of a third embodiment of a fan.

[0010] FIG. 6 is an isometric view of a fourth embodiment of a fan.

DETAILED DESCRIPTION

[0011] It will be appreciated that for simplicity and clarity of illustration, where appropriate, reference numerals have been repeated among the different figures to indicate corresponding or analogous elements. In addition, numerous specific details are set forth in order to provide a thorough understanding of the embodiments described herein. However, it will be understood by those of ordinary skill in the art that the embodiments described herein can be practiced without these specific details. In other instances, methods, procedures, and components have not been described in detail so as not to obscure the related relevant feature being described. Also, the description is not to be considered as limiting the scope of the embodiments described herein. The drawings are not necessarily to scale and the proportions of certain parts may be exaggerated to better illustrate details and features of the present disclosure.

[0012] Several definitions that apply throughout this disclosure will now be presented.

[0013] The term “substantially” is defined to be essentially conforming to the particular dimension, shape, or other feature that the term modifies, such that the component need not be exact. For example, “substantially cylindrical” means that the object resembles a cylinder, but can have one or more deviations from a true cylinder. The term “comprising” when utilized, means “including, but not necessarily limited

to”; it specifically indicates open-ended inclusion or membership in the so-described combination, group, series and the like.

[0014] The present disclosure is described in relation to a fan

[0015] FIGS. 1-3 illustrate a first embodiment of a fan 10. The fan 10 is used to dissipate heat from a component 24.

[0016] The fan 10 includes a bottom plane 11, and four protrusions 12. Four fixing holes 14, an air inlet 16, and an air outlet 18 are defined in the fan 10. The four protrusions 12 extend up from the bottom plane 11. The four fixing holes 14 and the air inlet 16 are defined on the bottom plane 11. The four protrusions 12 are located on sides of the four fixing holes 14. Each protrusion 12 includes a guiding surface 120 and a chamfer 122. The chamfer 122 extends from the guiding surface 120 into an edge of the protrusion 12. The guiding surface 120 extends into the fixing hole 14. In one embodiment, the bottom plane 11 can be substantially rectangular. The four protrusions 12 can be substantially located on four corners of the bottom plane 11. The air inlet 16 is defined in the centre of the bottom plane 11. The air outlet 18 is defined in a sidewall of the fan 10. The sidewall can be substantially perpendicular to the bottom plane 11. In one embodiment, each protrusion 12 can be substantially a half ring. The guiding surface 120 can be arc-shaped. A diameter of the guiding surface 120 is greater than a diameter of the fixing hole 14. The four guiding surfaces 120 curve toward a same direction.

[0017] A circuit board 20 includes four fixing posts 22. The component 24 is located on a central portion of the four fixing posts 22.

[0018] The fan 10 is moved to the circuit board 20 until the four fixing posts 22 engaged with the four guiding surfaces 120. The four fixing posts 22 are slid into the four fixing holes 14 guided by the four guiding surfaces 120. The fan 10 is fixed to the circuit board 20. When the component 24 is in a working state, heat produced by the component 24 can be dissipated by the fan 10 via the air outlet 18.

[0019] FIG. 4 illustrates a second embodiment of a fan 10. The four protrusions 12 can be substantially located on four corners of the bottom plane 11. The air inlet 16 is located on a centre of the bottom plane 11. The guiding surface 120 can be arc-shaped. At least two arcuate directions of the four guiding surfaces 120 are opposite.

[0020] FIG. 5 illustrates a third embodiment of a fan 10. The four protrusions 12 can be substantially located on four corners of the bottom plane 11. The air inlet 16 is located on a centre of the bottom plane 11. The guiding surface 120 can be arc-shaped. At least two guiding surfaces 120 face each other.

[0021] FIG. 6 illustrates a fourth embodiment of a fan 10. Each protrusion 12 can be substantially a ring. The guiding surface 120 can be circular.

[0022] The embodiments shown and described above are only examples. Many details are often found in the art such as the other features of a fan. Therefore, many such details are neither shown nor described. Even though numerous characteristics and advantages of the present technology have been set forth in the foregoing description, together with details of the structure and function of the present disclosure, the disclosure is illustrative only, and changes may be made in the details, especially in matters of shape, size, and arrangement of the parts within the principles of the present disclosure, up to and including the full extent

established by the broad general meaning of the terms used in the claims. It will therefore be appreciated that the embodiments described above may be modified within the scope of the claims.

What is claimed is:

- 1. A fan comprising:
 - a plurality of fixing holes;
 - a plurality of protrusions located on sides of the plurality of fixing holes, each of the plurality of protrusions comprising a guiding surface; and
 - wherein the plurality of guiding surfaces extends into the plurality of fixing holes.
- 2. The fan of claim 1, wherein each protrusion is substantially a half ring, and the guiding surface is arc-shaped.
- 3. The fan of claim 2, wherein the plurality of guiding surfaces curve toward a same direction.
- 4. The fan of claim 2, further comprising a bottom plane, wherein the plurality of protrusions is substantially located on four corners of the bottom plane, and the plurality of guiding surfaces face to each other.
- 5. The fan of claim 2, further comprising a bottom plane, wherein the plurality of protrusions is substantially located on four corners of the bottom plane, and arcuate directions of the plurality of guiding surfaces are opposite.
- 6. The fan of claim 1, wherein each protrusion is a ring, and each guiding surface is substantially circular.
- 7. The fan of claim 1, wherein each protrusion comprises a chamfer, and the chamfer extends from the guiding surface into an edge of the protrusion.
- 8. A fan assembly comprising:
 - a fan comprising a plurality of protrusions and defining a plurality of fixing holes; and
 - a circuit board comprising a plurality of fixing posts;

wherein the plurality of protrusions is located on sides of the plurality of fixing holes, each protrusion comprising a guiding surface, the plurality of guiding surfaces extends into the plurality of fixing holes, and the plurality of fixing posts are slid into the plurality of fixing holes guided by the plurality of guiding surfaces.

9. The fan assembly of claim 8, wherein the circuit board further comprises a component, and the component is located on a central portion of the plurality of fixing posts.

10. The fan assembly of claim 8, wherein each protrusion is substantially a half ring, and the guiding surface is arc-shaped.

11. The fan assembly of claim 10, wherein the plurality of guiding surfaces toward a same direction.

12. The fan assembly of claim 10, further comprising a bottom plane, wherein the plurality of protrusions is substantially located on four corners of the bottom plane, and the plurality of guiding surfaces curve toward a centre of the bottom plane.

13. The fan assembly of claim 10, further comprising a bottom plane, wherein the plurality of protrusions is substantially located on four corners of the bottom plane, and arcuate directions of the plurality of guiding surfaces are opposite.

14. The fan assembly of claim 8, wherein each protrusion is a ring, and each guiding surface is substantially circular.

15. The fan assembly of claim 8, wherein each protrusion comprises a chamfer, and the chamfer extends from the guiding surface into an edge of the protrusion.

* * * * *