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(54) **FAN**

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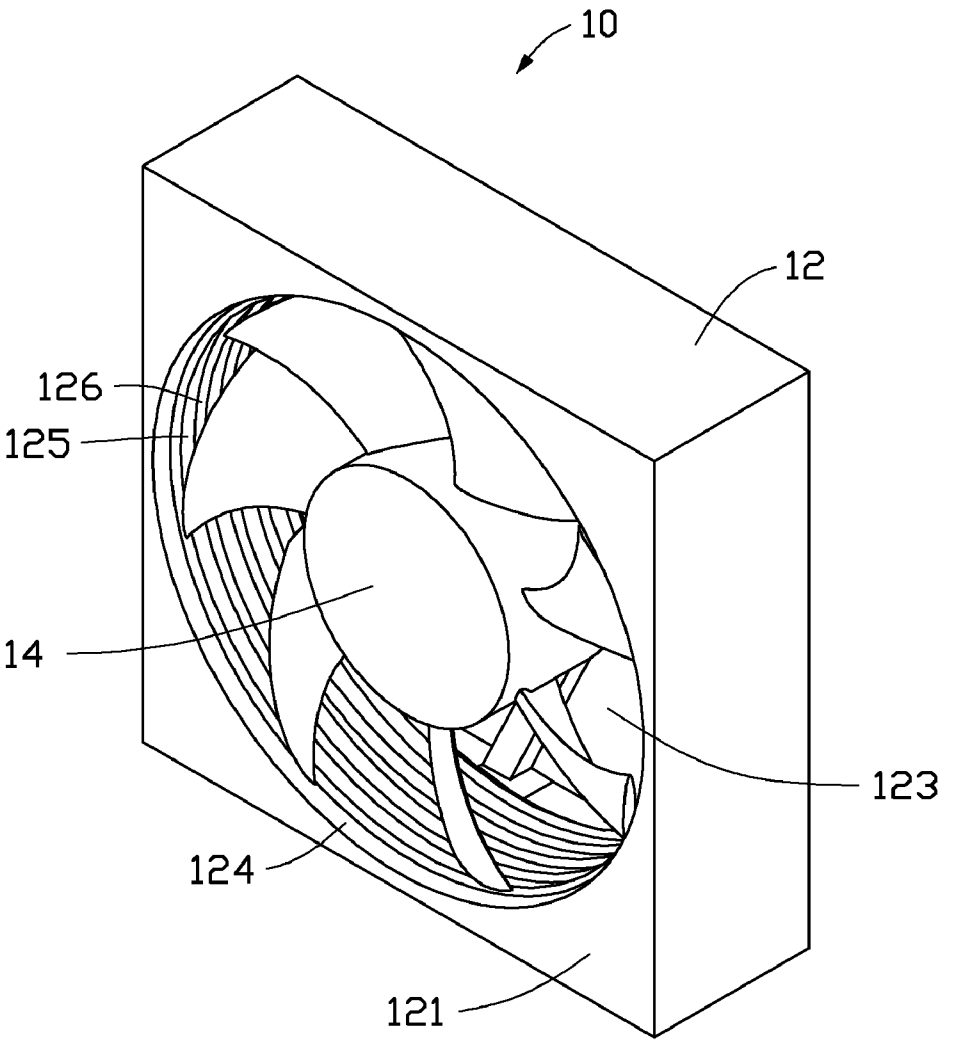
(57) **ABSTRACT**

A fan includes a frame and an impeller. The frame defines a hole in a middle of the frame. An inner wall of the frame bounding the hole defines a circumferential groove and forms a circumferential protrusion adjoining the groove. The impeller is received in the hole of the frame. When the impeller is rotated, airflow through the hole is pressurized by the groove and the protrusion, and concentrates when the airflow is blown out of the hole.



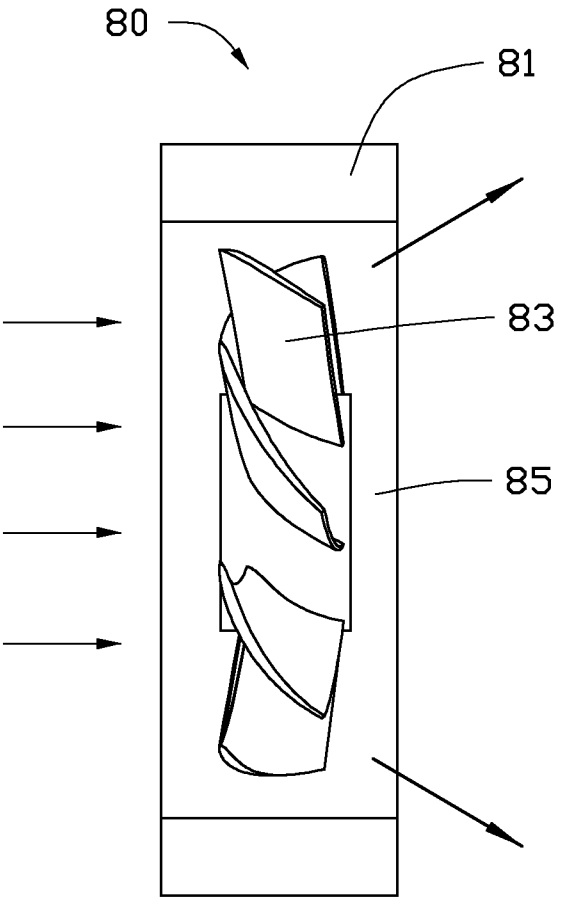


FIG. 1
(PRIOR ART)

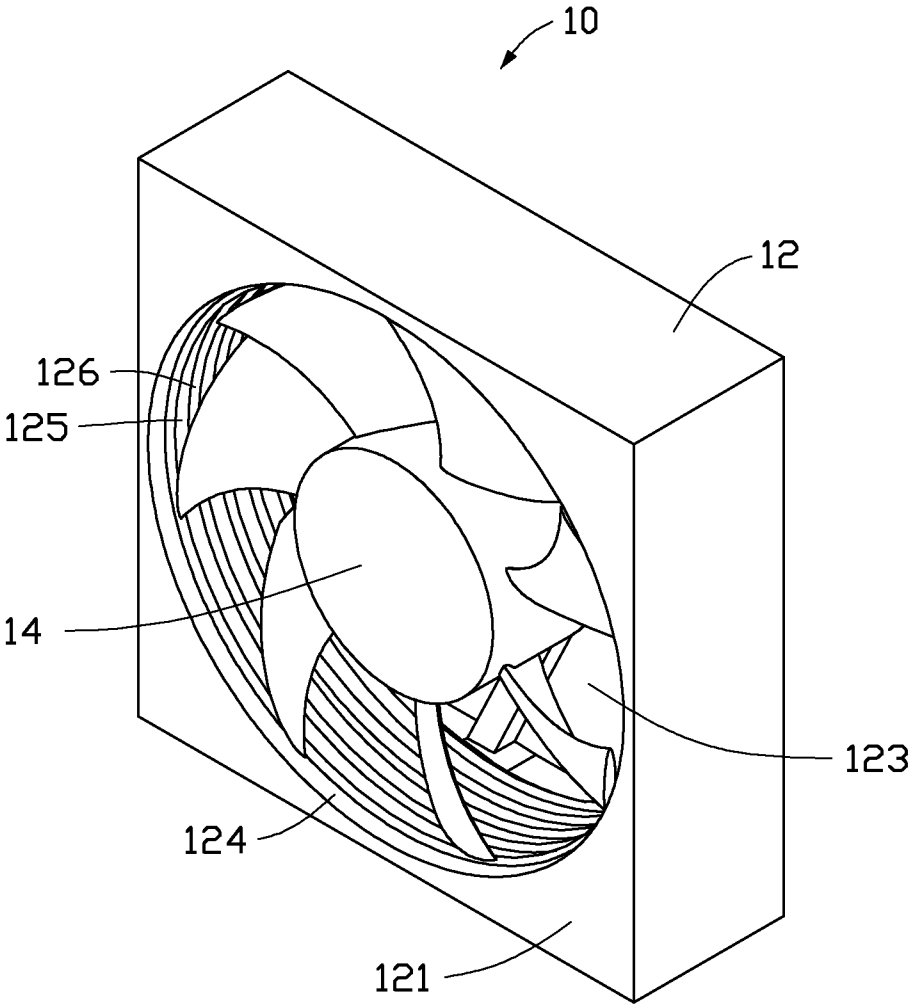


FIG. 2

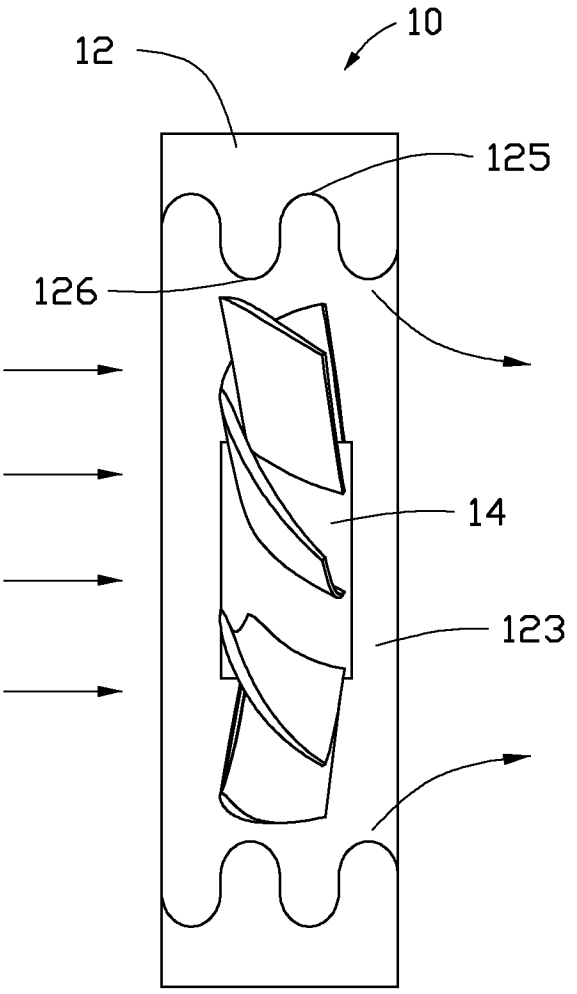


FIG. 3

FAN

BACKGROUND

[0001] 1. Technical Field

[0002] The present disclosure relates to a fan.

[0003] 2. Description of Related Art

[0004] FIG. **1** shows a typical fan **80** comprising a frame **81** and an impeller **83**. A circular hole **85** is defined in a middle of the frame **81**, for receiving the impeller **83**. An inner surface of the frame **81** bounding the hole **85** is smooth. When the impeller **83** is rotated, air is drawn into the hole **85** from a side of the fan **80**, and a considerable amount of air is radially flown out of the hole **85** from an opposite side of the fan **80**. Thereby, the fan **80** may not effectively dissipate heat for some devices which need heat dissipation by more concentrated air.

BRIEF DESCRIPTION OF THE DRAWINGS

[0005] Many aspects of the present embodiments can be better understood with reference to the following drawings. The components in the drawings are not necessarily drawn to scale, the emphasis instead being placed upon clearly illustrating the principles of the present embodiments. Moreover, in the drawings, all the views are schematic, and like reference numerals designate corresponding parts throughout the several views.

[0006] FIG. **1** is a plan, sketch view of a conventional fan in use.

[0007] FIG. **2** is an assembled, isometric view of an embodiment of a fan.

[0008] FIG. **3** is a plan, sketch view of the fan of FIG. **2** in use.

DETAILED DESCRIPTION

[0009] The disclosure, including the accompanying drawings, is illustrated by way of example and not by way of limitation. It should be noted that references to "an" or "one" embodiment in this disclosure are not necessarily to the same embodiment, and such references can mean "at least one."

[0010] FIGS. **2** and **3** show an exemplary embodiment of a fan **10** comprising a frame **12** and an impeller **14**.

[0011] The frame **12** comprises two opposite sidewalls **121**. A hole **123** having an elliptic cross section is defined in a middle of the frame **12**, extending through the sidewalls **121**. The impeller **14** is mounted in the hole **123**. A plurality of circumferential grooves **125** is defined in an inner wall **124** of the frame **12** bounding the hole **123**, such that two circumferential protrusions **126** are formed on the inner wall **124** adjoining opposite sides of each groove **125**. In the embodiment, a cross section of each groove **125** and each protrusion **126** is arc-shaped, such that the grooves **125** and the protrusions **126** cooperate to form a wave-shaped surface on the inner wall **124** of the frame **12**.

[0012] In use, the impeller **14** is rotated, airflow is drawn into the hole **123** from an end of the hole **123**, and is blown out of the hole **123** from an opposite end of the hole **123**. Because the spaced grooves **125** and protrusions **126** are formed on the inner wall **124** bounding the hole **123**, the airflow through the hole **123** is pressurized by the grooves **125** and the protrusions **126**, and concentrates when the airflow is blown out of the hole **123**. Thereby, the fan **10** can provide stronger, concentrated airflow.

[0013] In the embodiment, a cross section of the hole **123** is elliptic, which can reduce wind noise.

[0014] In other embodiments, the inner wall **124** can define only one circumferential groove **125** and form only one circumferential protrusion **126** adjoining the groove **125**.

[0015] Even though numerous characteristics and advantages of the embodiments have been set forth in the foregoing description, together with details of the structure and the functions of the embodiments, the disclosure is illustrative only, and changes may be made in details, especially in the matters of shape, size, and arrangement of parts within the principles of the embodiments to the full extent indicated by the broad general meaning of the terms in which the appended claims are expressed.

What is claimed is:

1. A fan, comprising:

a frame defining a hole in a middle of the frame, an inner wall of the frame bounding the hole defining a circumferential groove and forming a circumferential protrusion adjoining the groove; and

an impeller received in the hole of the frame, wherein when the impeller is rotated, airflow through the hole is pressurized by the groove and the protrusion, and concentrates when the airflow is blown out of the hole.

2. The fan of claim **1**, wherein the groove and the protrusion cooperate to form a wave-shaped surface on the inner wall of the frame.

3. The fan of claim **2**, wherein a cross section of each of the groove and the protrusion is arc-shaped.

4. The fan of claim **1**, wherein a cross section of the hole is elliptic.

5. A fan, comprising:

a frame defining a hole in a middle of the frame, an inner wall of the frame bounding the hole defining a plurality of circumferential grooves and forming two circumferential protrusions adjoining opposite sides of each groove; and

an impeller received in the hole of the frame, wherein when the impeller is rotated, airflow through the hole is pressurized by the plurality of grooves and protrusions, and concentrates when the airflow is blown out of the hole.

6. The fan of claim **5**, wherein the plurality of grooves and protrusions cooperate to form a wave-shaped surface on the inner wall of the frame.

7. The fan of claim **6**, wherein a cross section of each groove and each protrusion is arc-shaped.

8. The fan of claim **5**, wherein a cross section of the hole is elliptic.

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