

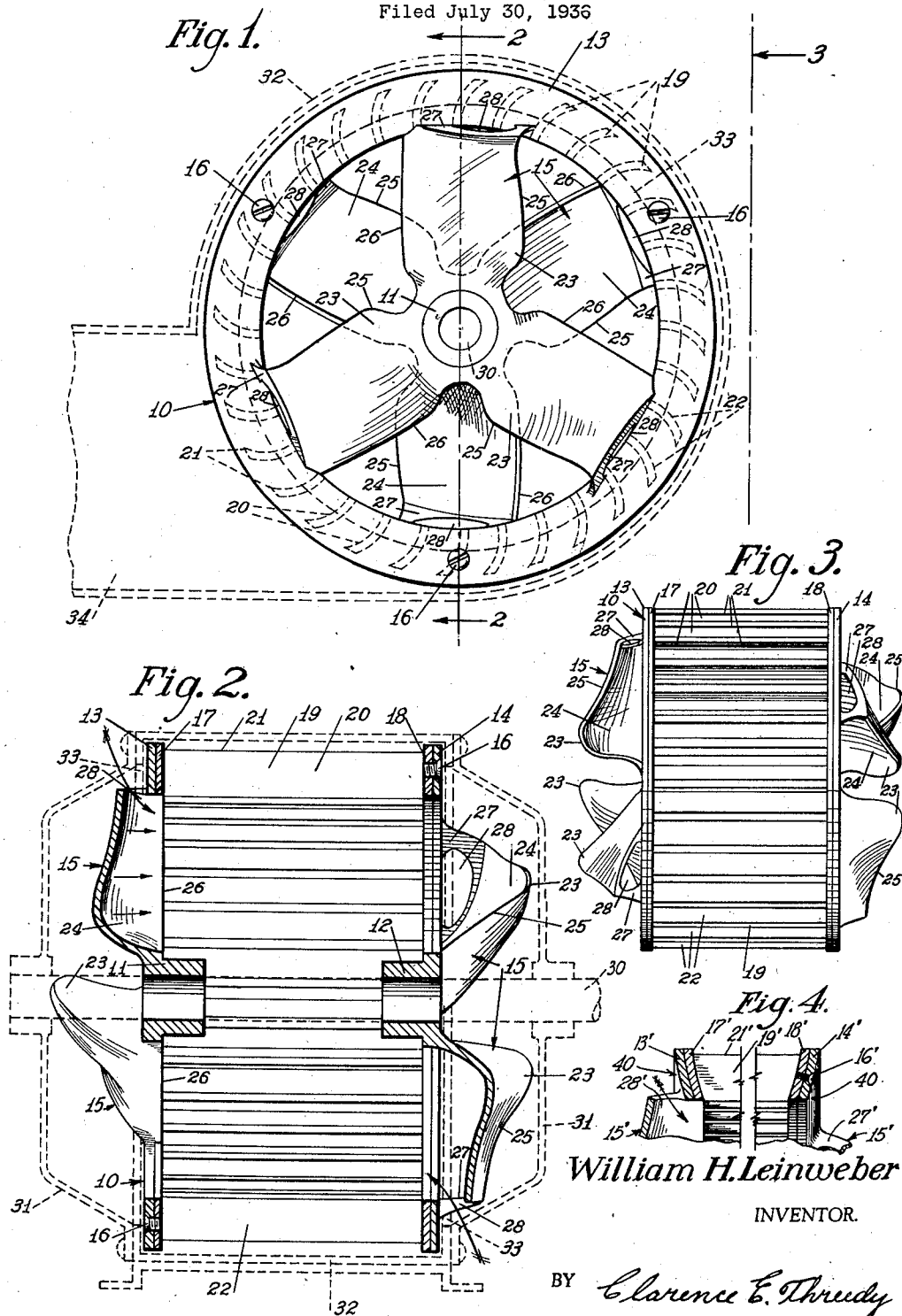
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BLOWER

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BLOWER

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7 Claims. (Cl. 230—119)

This invention relates to blowers.

It is an object of this invention to provide an improved blower which is relatively simple and inexpensive in construction, and efficient in use.

Another object of the present invention is to provide a blower particularly adapted for use in conjunction with ventilating and air conditioning apparatus, so constructed that it will circulate air at a greater velocity with less resistance than blowers heretofore made.

A further object of the present invention is to provide a blower for utilizing the air forced into the housing from the two sides to draw additional air into the housing, thus increasing the efficiency of the blower.

Other objects will appear hereinafter.

The invention consists of the novel combination and arrangements of parts to be hereinafter described and claimed.

The invention will best be understood by reference to the accompanying drawing in which:

Fig. 1 is a side elevational view of a preferred form of the new blower;

Fig. 2 is a vertical sectional view of the same as seen on line 2—2, Fig. 1;

Fig. 3 is an end elevational view as seen from line 3 in Fig. 1; and

Fig. 4 is a fragmentary sectional view of a modified form of the rim structure and annular ring structure shown in Fig. 2 of the preferred form of the new blower.

A preferred form of the new blower is illustrated in the drawing and comprises a body 10 which includes a pair of impeller units in the form of a pair of hub structures 11 and 12 each of which have a plurality of arms 15 in the form of fan blades extending radially therefrom and merging into rim portions 13 and 14 respectively. These rim portions 13 and 14 are fixed by means of screws 16 to a pair of corresponding annular rings 17 and 18 which are disposed in spaced relation with respect to each other by a plurality of vanes 19 which are formed as an integral part of the annular rings 17 and 18.

The vanes 19 extend parallel to the axis of the hubs 11 and 12 and have a concaved curvature on one side or face 20 thereof, these concaved sides or faces 20 of the vanes 19 facing toward the leading edges 21 of the vanes 19; that is, facing in the direction in which the blower is rotated when in use (clockwise Fig. 1) and facing away from the trailing edges 22 of the vanes 19.

The arms 15 comprise impeller blades or cups 23 providing concave curvatures or faces 24 extending between the leading edges 25 and the trailing edges 26 of the blades 15 and facing in a general direction in which the blower is rotated when in use.

The arms or impeller blades 15 extend from the hub portion 11, or 12, with the leading edge

25 disposed substantially away from the rim portion 13 or 14 at the radial extremity of the blades 15 but having a supporting web 27 formed integrally therebetween; the trailing edge 26 at the radial extremity of the blades 15 merging into the rim portion 13 or 14, as the case may be, thus leaving an open space 28 between the blade and the rim 13 or 14 for a reason to be given presently.

In use the new blower may be mounted upon a drive shaft 30 shown in dotted lines (Fig. 2) which is supported by a pair of brackets 31 also shown in dotted lines. These brackets in turn are supported by a housing 32, likewise shown in dotted lines, which is open at both sides as at 33 and which has a duct portion 34 leading tangentially therefrom.

It is to be noted that while the vanes 19 of the blower are contained within the housing 32, the impeller blades 15 may extend through the side openings 33 formed in the housing 32 and that the openings 28 formed at the radial extremity of each of the blades 15 are substantially outside the housing 32.

In the operation of the blower (clockwise as seen in Fig. 1) air is drawn into the housing 32 by the impeller blades 15, the cups 23 impelling air over the concave curvature or face 24 of the blades 15. The velocity of the air moving along the face 24 sets up a vacuum in the region of the openings 28 and draws air therethrough from a direction at an angle to the axis of the hubs 11 and 12 (as indicated by the arrows, Fig. 2), thereby gaining a greater supply of air for the blower unit. The air thus drawn in from both sides of the housing 32 is swished within the latter by the vanes 19, the concave faces 20 of which force the air centrifugally from the axis of the hub structure and out through the duct 34.

Referring to Fig. 4, 13' and 14' illustrate a modification of the rim portions 13 and 14 of the device shown in Figs. 1, 2 and 3; similarly, 17' and 18' illustrate a corresponding modification of the annular rings 17 and 18 of the same.

These annular rings 17' and 18' and rim portions 13' and 14' are pitched inwardly as shown (Fig. 4) to provide a curved surface 40 at the outer surface of the rims 13' and 14' with respect to the blower unit. In view of the structural characteristics of the rims 13' and 14' it will be noted the latter are funnel shaped and thereby increase the intake of air into the blower unit at a minimum of resistance and likewise increase the efficiency of the new blower unit.

Other parts illustrated in Fig. 4 corresponding to the respective parts of the illustration in Fig. 2, are given primed numerals which correspond with the ordinary numerals of the preferred showing.

While I have illustrated and described the pre-

ferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:

1. A blower comprising a pair of air impellers each having a hub member aligned co-axially with the other and each having blade members attached to their respective hub members and having formations extended axially in advance of said hub member, each said impeller having an annulus extended around and attached to the radial extremities of said blades, each of said blades having an opening adjacent its said radial extremity, and a plurality of vanes arranged around the common axis of said hubs between the respective annular parts of said impellers.

2. A blower including a pair of spaced oppositely disposed air impellers each having hub portions and each having blades with a pocket-like formation extended axially in advance of the hub portion thereof for engaging air in a region closely adjacent said hub, each said impeller having a ring-like member joining the radial ends of said blades, and each of the latter having an opening in the radial extremity thereof adjacent said ring member, and a plurality of blades arranged in spaced relation around said hub portions and secured to said ring-like members of each of said impellers.

3. In a blower comprising a body including a pair of impeller units each including a hub structure, a plurality of impeller blades radially arranged about and integral with the hub structure, said impeller blades having a leading edge and a trailing edge, said trailing edge merging at the radial extremity of said impeller blade with a rim, and said leading edge disposed substantially laterally from said rim to form an opening between the latter and the radial extremity of said blade, said pair of impeller units being disposed in spaced relation with respect to each other by a plurality of vanes extending between the rims of said impeller units and having their axis extending substantially parallel relative to each other and the axis of said hub structures.

4. In a blower comprising a body including a pair of impeller units each including a hub structure, a plurality of impeller blades radially arranged about and integral with the hub structure, said impeller blades having a leading edge and a trailing edge, said trailing edge merging at the radial extremity of said impeller blade with a rim, and said leading edge disposed substantially laterally from said rim to form an opening between the latter and the radial extremity of said blade, said pair of impeller units being disposed in spaced relation with respect to each other by a plurality of vanes extending between the rims of said impeller units and having their axis extending substantially parallel relative to each other and the axis of said hub structure, whereby when said blower is in use air will be directed by said impeller blades between said impeller units and will be directed by the vanes tangentially from the radially outer ends of the latter.

5. In a blower comprising a body including a

pair of impeller units each including a hub structure, a plurality of impeller blades radially arranged about and integral with the hub structure, said impeller blades having a leading edge and a trailing edge, said trailing edge merging at the radial extremity of said impeller blade with a rim, and said leading edge disposed substantially laterally from said rim to form an opening between the latter and the radial extremity of said blade, said body including a pair of annular rings having a plurality of vanes arranged therebetween and integrally therewith, each of said annular rings having one of said impeller units fixed thereto at the outer side thereof with respect to the vanes, said vanes having their axis extending substantially parallel relative to each other and the axis of said hub structure, whereby when said blower is in use air will be directed by said impeller blades between said impeller units and will be directed by the vanes tangentially from the radially outer ends of the latter.

6. In a blower comprising a body including a pair of impeller units each including a hub structure, a plurality of impeller blades radially arranged about and integral with the hub structure, said impeller blades having a leading edge and a trailing edge, said trailing edge merging at the radial extremity of said impeller blade with a rim, and said leading edge disposed substantially laterally from said rim to form an opening between the latter and the radial extremity of said blade, said body including a pair of annular rings having a plurality of vanes arranged therebetween and integrally therewith, each of said annular rings having one of said impeller units fixed thereto at the outer side thereof with respect to the vanes, said vanes having their axis extending substantially parallel relative to each other and the axis of said hub structure, whereby when said blower is in use air will be directed by said impeller blades to a point between said impeller units and will be directed by the vanes tangentially from the radially outer ends of the latter thereby drawing additional air through the opening formed between the radial extremity of the impeller blade and the rim to a point between said impeller units.

7. In a blower comprising a body including a pair of impeller units each including a hub structure, a plurality of impeller blades radially arranged about and integral with the hub structure, said impeller blades having a leading edge and a trailing edge, said trailing edge merging at the radial extremity of said impeller blade with a rim, and said leading edge disposed substantially laterally from said rim to form an opening between the latter and the radial extremity of said blade, said body including a pair of annular rings having a plurality of vanes arranged therebetween and integrally therewith, each of said annular rings having one of said impeller units fixed thereto at the outer side thereof with respect to the vanes, said vanes having their axis extending substantially parallel relative to each other and the axis of said hub structure, said rim having a curved outer face with respect to said body cooperable with said impeller units when said blower is in use to direct air impelled by said impeller units to a point substantially between the said impeller units whereby said air may be directed by the vanes tangentially from the radially outer ends of the latter.

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