United States Patent [19]

Tucker

[11] **3,856,431**

[45] **Dec. 24, 1974**

[54] **SIDE EXPANSION SCROLL-TYPE BLOWERS**

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[22] Filed: **Oct. 24, 1973**

[21] Appl. No.: **409,108**

[52] **U.S. Cl.**..... **415/219,** 415/98, 415/206

[51] **Int. Cl.** .. **F01d 25/24,** F04d 24/40, F04d 29/44

[58] **Field of Search**..... 415/54, 86, 87, 219 C, 415/98, 206, 207, 93, 97; 416/178, 187

[56] **References Cited**

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FOREIGN PATENTS OR APPLICATIONS

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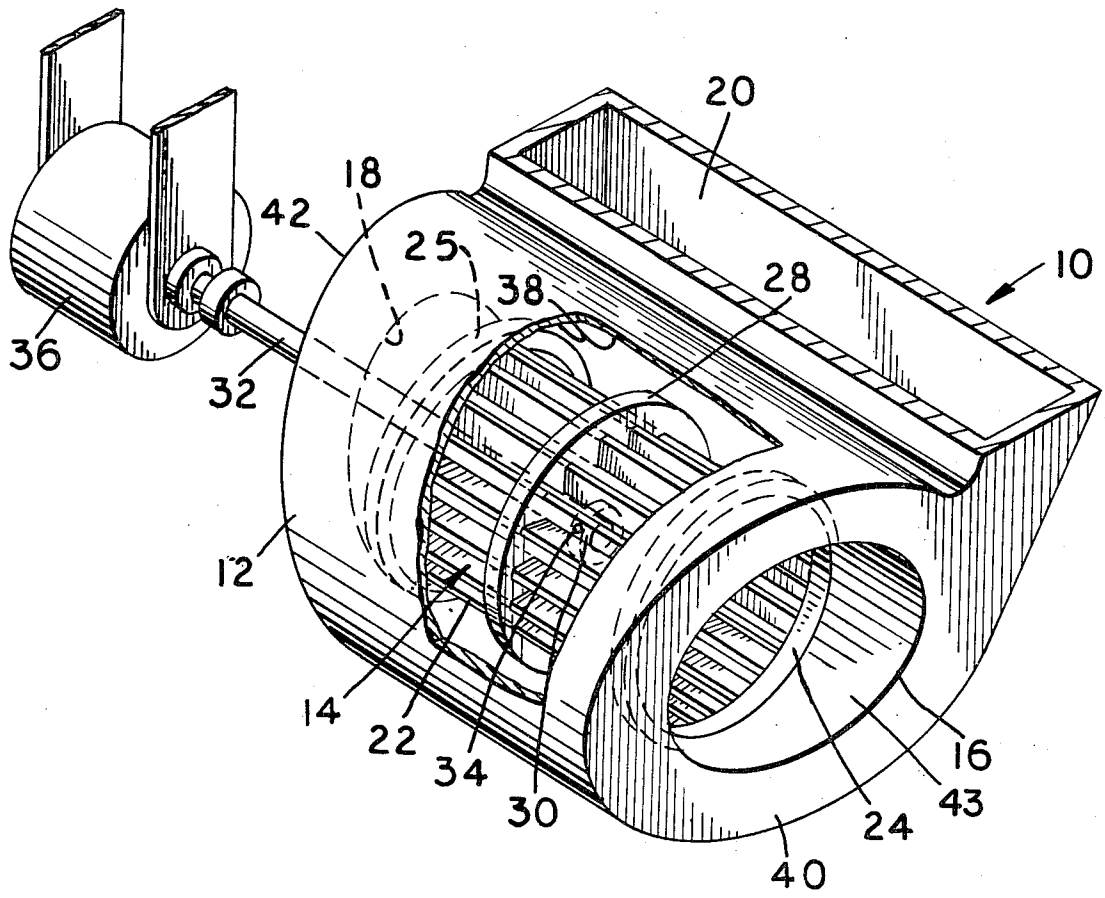
[57] **ABSTRACT**

An expanding scroll-type blower unit with a fan wheel which discharges air peripherally from an encasing housing and has axial air intakes is provided with sides diverging toward an exit opening that is parallel to the blower axis, and two such blower units are arranged side by side in axially alignment with a motor therebetween operatively connected to both wheels.

4 Claims, 3 Drawing Figures



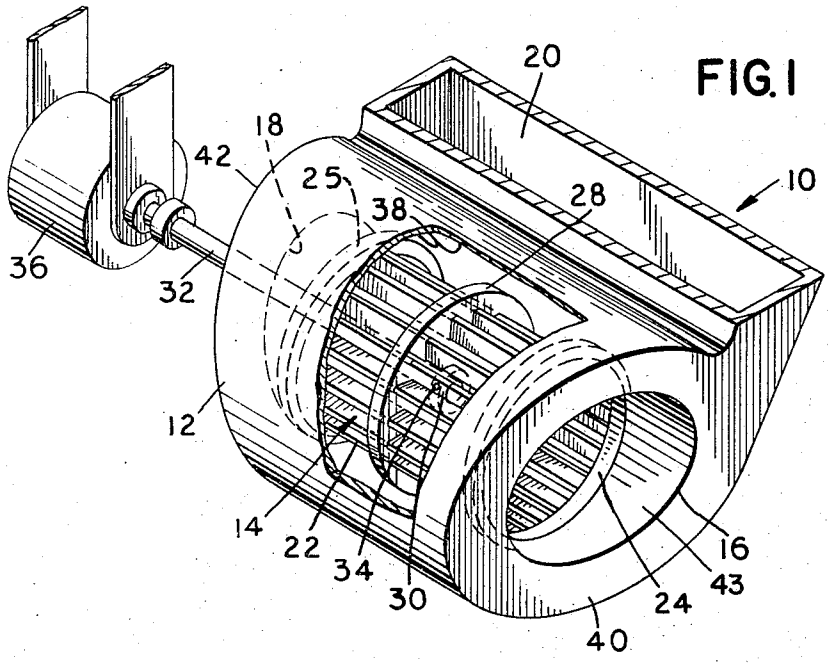


FIG. 1

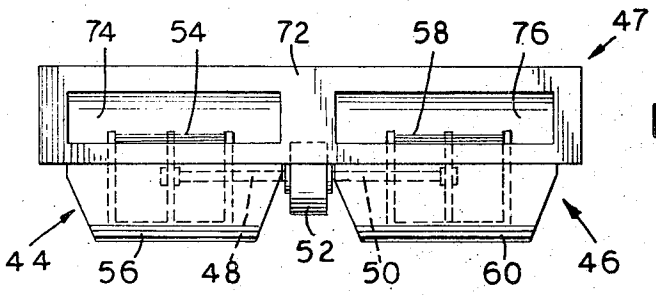
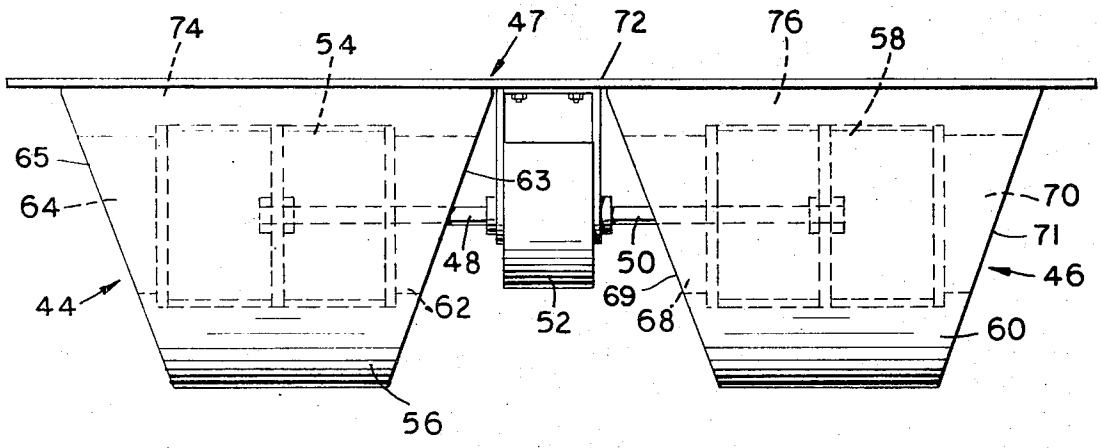


FIG. 3

FIG. 2



SIDE EXPANSION SCROLL-TYPE BLOWERS

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention relates to air handling apparatus and more particularly is directed to scroll-type blowers.

2. Description of the Prior Art

Blowers having a fan wheel rotatively mounted in a scroll-type housing with axial air inlets and an outlet parallel to the axis of rotation are well known, examples of such blowers being shown, for example, in U.S. Pat. Nos. 2,290,423; 2,569,646; 2,710,573 and 3,098,603.

In the usual expanding scroll-type blower, end surfaces of the blower housing are parallel and distances between the axis of the blower fan and surrounding scroll-like surface of the housing increase at a constant rate with angular rotation in the direction of air discharge. In such blowers, the only way in which the space between the fan and surrounding scroll-like surface may be increased to provide for additional air flow is to increase the rate at which the dimensions between the fan and scroll-like surface increase. The result is that in the case of any particular blower designed to deliver a specific quantity of air in a certain time, the dimensions of the unit may be such that it cannot be readily fitted into available space or it may not be suited to the particular use for which it is intended. Also, when two such blowers are used in parallel, it is necessary to keep them far enough apart so that air may enter adjacent axial inlet passages unrestricted and this results in a highly localized air velocity pattern at the blower exits leaving the blowers with zero or negative velocity between the units.

SUMMARY OF THE INVENTION

The blower of the invention by reason of a special configuration, possesses various advantages over the blowers of the prior art. In accordance with the invention an expanding scroll-type blower having axial inlets and a fan from which air is peripherally expelled is provided with sides which diverge toward an exit opening that is parallel to the blower axis, and in a particularly desirable arrangement two such blowers are axially aligned and both fans are connected to a single driving unit which is situated between the blower housings.

It is an object of the invention to increase the output of an expanded scroll-type blower without increasing the average axial length of the unit or increasing distances between the blower fan and surrounding scroll-like surface.

It is another object of the invention to provide expanded scroll-type blowers which can be arranged side by side in close relationship without restricting the flow of air into axial inlet passages or resulting in an undesirable output air velocity pattern across the units.

It is still another object of the invention to provide expanded scroll-type blowers which can be arranged side by side and will nicely accommodate a driving unit between axial inlet openings in a minimum amount of space for cooling by air drawn into the blower units.

Still other objects and advantages of the invention will become apparent hereafter.

DESCRIPTION OF THE DRAWINGS

FIG. **1** is a somewhat diagrammatic perspective view showing a scroll-type blower unit constructed according to the invention;

FIG. **2** is a front elevational view showing two blowers according to the invention connected to a single driving unit situated between the blower housings;

FIG. **3** is a reduced-scale top view of the blowers and driving unit illustrated in FIG. **2.**

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIG. **1** of the drawings, reference character **10** designates a blower according to the invention including a housing **12,** a fan **14** rotatable within the housing, axial inlet openings **16** and **18,** and an outlet opening **20** extending parallel to the axis of the blower as defined by the axis of the fan. The fan **14** is of a centrifugal type having fan blades **22** which are affixed at opposite ends in rings **24** and **25.** A center support plate **28** for the fan blades includes a hub **30** to which a drive shaft **32** is attached as by set screw **34.** The fan **14** is rotated by a motor **36** connected to the shaft **32.** Bearings in the motor rotatably support the fan although alternatively bearings may be provided in the housing **12** around the rings **24** and **25** for this purpose.

The blower **10** is of an expanding scroll-type in that the housing **12** includes surface **38** which extends in the form of a spiral around the fan **14** to outlet opening **20.** The housing **12** also includes planar side surfaces **40** and **42** which are at opposite ends of the spirally extending surface **38** and diverge toward the exit opening **20** of the blower. The side surfaces **40** and **42** include the axial openings **16** and **18** respectively mentioned hereinbefore. Air enters the housing **12** through such axial openings when fan **14** is rotated by the motor **36.** The air flows to the fan through an inlet duct **43** communicating with opening **16,** and through another like duct communicating with opening **18.** The fan acting upon the air flowing into the blower discharges such air peripherally into that portion of the housing which surrounds the fan and the air is ultimately expelled at high velocity through outlet opening **20.**

In FIGS. **2** and **3,** two blowers **44** and **46** generally similar to the blower **10** already described are shown in an assembly **47** wherein the configuration of the blower of the invention is used to maximum advantage. The blowers **44** and **46** are of a different hand in that their drive shafts, designated by reference characters **48** and **50** respectively, extend from different ends of the units. A single motor **52** between the blowers connects with both drive shafts. As shown, drive shaft **48** is affixed to a fan **54** which operates within housing **56** of blower **44,** and drive shaft **50** is affixed to a fan **58** which operates within housing **60** of blower **46.** Housings **56** and **60** of blowers **44** and **46** correspond in configuration to the housing of blower **10.** The housing **56** of blower **44** includes air inlet ducts **62** and **64** between the fan **54** and the inlet openings **63** and **65** respectively, whereas the housing **60** of blower **46** includes air inlet openings **68** and **70** between the fan **58** and inlet openings **69** and **71.** Motor **52** is supported from a frame **72** which is secured as by welding to the blower housings **56** and **60** and defines outlet openings **74** and **76** respectively.

While the invention has been described in its preferred form, it is to be understood that the words which have been used are words of description rather than of limitation, and that changes within the purview of the appended claims may be made without departing from the true scope and spirit of the invention.

Having thus set forth the nature of the invention what is claimed herein is:

1. A blower unit comprising a fan wheel from which air is discharged peripherally, and a housing for said wheel including sloping side surfaces between which the wheel is wholly located, the side surfaces including openings through which air enters the housing, said housing also including ducting between the openings in the side wall and fan wheel through which the inlet air may flow to the wheel in directions generally parallel to the axis of said wheel and including a surface between the side surfaces extending in the form of a spiral about the wheel to an opening from which air moved by the wheel may be expelled, said side surfaces extending in directions diverging toward the exit opening.

2. The combination of claim **1** wherein the side surfaces are planar and the openings therein, of which there is one in each side surface, are circular.

3. The combination of claim **2** wherein the centers of said circular openings are on the axis of the fan wheel.

4. In combination, a pair of blower units each as defined in claim **1** with the axes of the blower wheels in alignment and motor means between adjacent side walls of the units operatively connected to the wheels for simultaneously driving said wheels.

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