Oct. 5, 1948. B. ESSICK 2,450,647

BLOWER

Filed Jan. 16, 1945

Fig. 1.

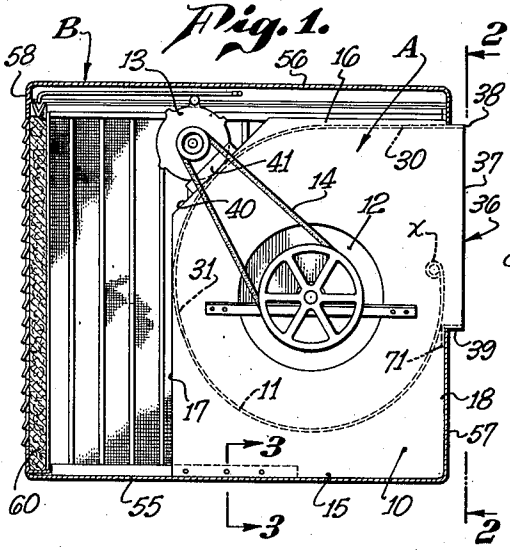


Fig. 2.

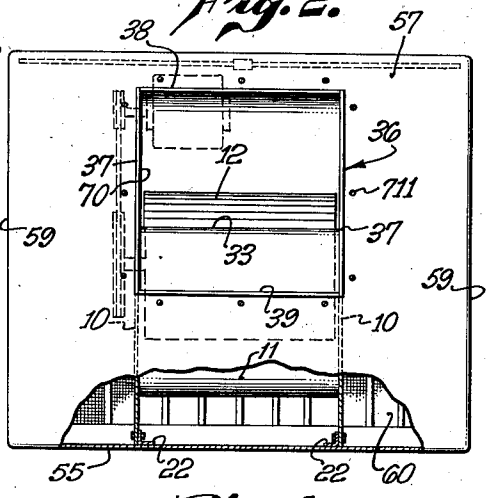


Fig. 3.

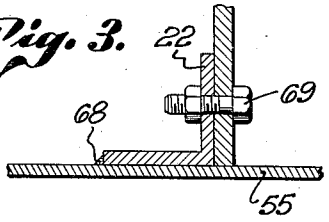


Fig. 4.

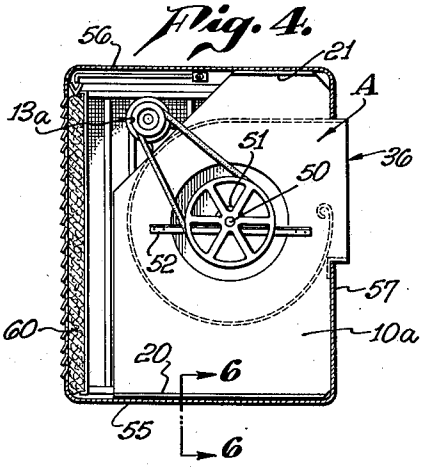


Fig. 5.

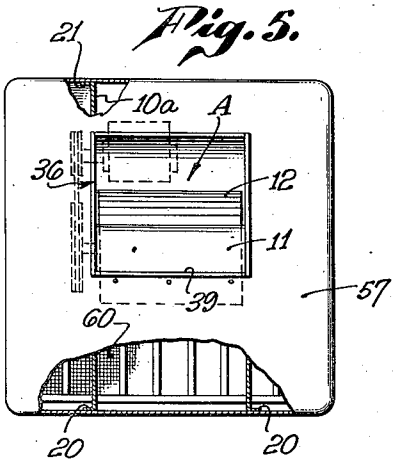
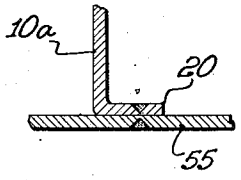


Fig. 6.



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BLOWER

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Application January 16, 1945, Serial No. 572,997

10 Claims. (Cl. 230—117)

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This invention has to do with a blower and relates more particularly to a combined blower and casing, it being a general object of the invention to provide a combined blower and casing which is strong and stable and which involves a minimum number of simple, inexpensive parts.

There are numerous situations where blowers are provided with casings, for example, in air coolers or in air conditioning apparatus it is common to employ a blower to circulate air and to provide a case around the blower to house it, or to carry other elements such as evaporative cells, etc. It is common to construct a blower as a unit and to build a case for a blower as a unit and then mount the blower in the case. This usual construction requires that the blower in and of itself be constructed so that it is sturdy and can be handled as a unit, and also that the case which is commonly formed of sheet metal be of heavy construction or provided with a frame and other elements giving it stability and rigidity so that it can be handled as a unit.

It is a general object of the present invention to provide a combined blower and case which forms a single, unitary structure that is strong and stable and which eliminates numerous elements such as frame parts required when a comparable blower and case are formed separately. With the construction of the present invention the two elements, namely the blower and the case, supplement each other and their parts are joined together so that they strengthen, stiffen and reinforce each other, all to the end that the final unitary structure is strong, rigid and stable, and yet involves fewer parts than is ordinarily required in a structure of this general character.

Another object of the present invention is to provide a unitary structure involving a blower and case in which the several parts are exceedingly simple and inexpensive in form and are such that they can be readily assembled or combined to establish the final unitary structure.

Another object of the present invention is to provide a construction of the general character hereinabove referred to involving a blower with a driving motor on the exterior thereof located so that the motor does not project from the other parts of the blower in a manner to require a case appreciably larger than that barely necessary to house the said other parts of the blower. With the construction of the present invention the housing of the blower has one corner constructed to accommodate the motor which drives the blower so that the motor is, in effect, confined within the general contour of the housing or within a rectangular area that will barely accommodate the housing, all to the end that the motor is not a projection requiring special space in the case.

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It is another object of the present invention to provide a combined blower and case therefor, which case is formed primarily of sheet metal parts and is entirely free of the usual angle iron frame elements, or like parts, usually required in a structure of this character to hold the sheet metal parts in place.

The various objects and features of my invention will be fully understood from the following detailed description of typical preferred forms and applications of my invention, throughout which description reference is made to the accompanying drawings, in which:

Fig. 1 is a view taken through a structure embodying the present invention showing the general arrangement or location of the blower within the case. Fig. 2 is a front view of the structure shown in Fig. 1, being a view taken as indicated by line 2—2 on Fig. 1. Fig. 3 is an enlarged detailed sectional view taken as indicated by line 3—3 on Fig. 1. Fig. 4 is a view similar to Fig. 1 showing another form of construction. Fig. 5 is a view similar to Fig. 2 showing the form of construction illustrated in Fig. 4, and Fig. 6 is an enlarged detailed sectional view taken as indicated by line 6—6 on Fig. 4.

The device or structure provided by my invention can be used, generally, where it is desired to combine a blower and a case therefor. Since air coolers or air conditioning apparatus commonly involve such a combination I have for purpose of example illustrated the invention in such a situation, that is, I have shown it applied to or incorporated in the combination of a blower for circulating air and a case for such blower, which case also carries evaporative cells and means for wetting such cells so that the combined structure, in total, forms what is generally known as an evaporative cooler. It is to be understood that the broader principles of this invention are not to be confined to this specific use or application, but that the invention can be used generally wherever a blower and case are used together.

The two essential elements of the structure that I have provided are the blower A and the case B in which the blower is arranged. Since my present invention combines these two elements so that their parts are joined or interlocked so that one braces and stabilizes the other, it is hardly proper to consider these elements wholly separate and apart. However, to facilitate an understanding I will refer to them separately and then explain the manner in which they are combined.

The blower A involves, generally, spaced side plates 10, a curved body 11 extending between and joined to the side plates forming a chamber in which the rotor 12 operates and a drive for the rotor which includes a motor 13 mounted on

the exterior of the housing and a suitable drive, for instance a belt drive 14, between the motor and the rotor.

The side plates 10 of the blower housing are preferably flat sheet metal elements substantially rectangular in shape, so that each presents a straight bottom edge 15, a straight top edge 16, a straight vertical rear edge 17, and a straight vertical front edge 18. In practice I may stiffen the plates by turning the edge portions thereof so that they present flanges such as the flange 20, shown along the bottom edge in Figs. 4 and 6, or the flange 21 shown along the top edge as shown in Fig. 4, or they may be stiffened by the application of a stiffening member or angle iron 22, as shown at the lower edge in Figs. 1, 2 and 3 of the drawings. In the particular forms of construction shown in the drawings angle irons 22 are applied only along the lower edge portions of the side plates 10 while integral flanges 20 and 21 are turned only along the top and bottom edges of the side plates 10a shown in Figs. 4 to 6, inclusive. It is to be understood, however, from these typical illustrations that either applied members or integrally turned parts can be employed at any of the edges of the side plates where such are desired or necessary.

The body of the blower housing is preferably formed of a single, continuous sheet or strip of sheet metal suitably formed or bent and secured between the side plates 10. In the case illustrated the body has a top wall portion 30 extending between the upper edge portions of the side plates and disposed substantially horizontally and it has a curved or convolute portion 31 continuing rearwardly and downwardly from the top 30 and then forwardly and downwardly and then forwardly and upwardly to terminate at a point X spaced somewhat below the top 30 and between the forward edge portions of the side plates to form a discharge opening for the blower between its upper edge 33 and the top 30. The edges of the sheet which form the body of the blower are preferably permanently joined or secured to the side sheets or side plates 10, as by welding, so that the body and side plates form a rigid integral structure.

A suitable discharge duct 36 is provided at the discharge opening of the blower by providing forwardly projecting flange parts 37 at the front edges 18 of the side plates and a forwardly projecting flange 38 may be provided on the top wall 30 of the body to extend between the upper ends of the flanges 36 and a lower flange 39 may be provided to join the lower ends of the flanges 37; the several flanges forming a rectangular duct to which a suitable conduit, or the like, may be connected, if desired.

In accordance with my present invention the upper rear corners of the side plates 10 are beveled or cut away to form diagonally disposed rear corner edges 40, the corners being thus cut away as far as is possible without interfering with the body of the housing which is secured to the plates. By thus beveling the upper rear corners of the side plates the upper rear portion of the housing is removed, leaving a space to conveniently accommodate the motor 13. The motor can be mounted in the said space in any suitable manner, it being preferred to mount it directly on the housing. In the form of the invention shown in Fig. 1 the motor is shown mounted on a base plate 41 which extends between the beveled edges 40 of the side plates, whereas in Fig. 4 of the drawings I show an arrangement wherein the motor 13a is mounted on the curved rearwardly and downwardly extending wall of the body of the housing. When the motor of the blower is mounted in this manner it is mounted so that it does not project from the structure in a manner to be in the way or to make it necessary to provide a case for the blower appreciably larger than the blower itself. In the case shown in Fig. 4 where the motor 13a is small, it will not project beyond the area defined by the said sides of the blower housing. However, as shown in Fig. 1, the motor 13 is somewhat larger and even so projects only slightly to the rear of the rear edges 17 and only slightly above the top edges 16 of the side plates 10.

The rotor 12 of the blower may be mounted in the housing in any suitable manner, as for instance on a shaft 50 supported in bearings 51 carried by brackets 52 applied to the side plates of the housing. The drive shown in the drawings between the motor and the rotor is a belt drive involving a belt running over pulleys on the motor shaft and the shaft 50.

The case B may be formed almost entirely of sheet metal. In the preferred construction the case involves, primarily, a sheet metal bottom wall 55, a sheet metal top wall 56, a sheet metal front wall 57, a sheet metal rear wall 58, and sheet metal side walls 59. In the particular design shown in the drawings the several walls of the case are flat sheet metal parts, the bottom, top and front walls being continuous flat sheets, whereas the rear and side walls have large openings in them to accommodate evaporative cells 60. In accordance with my invention the several parts of the case can be formed separately as desired, or adjacent parts can be formed integrally and, in effect, the several parts together form a sheet metal box-like structure to house the blower A.

In accordance with my present invention the blower A is incorporated in the case B so that these two elements reinforce and brace each other or, in other words, so that they are united to form a single integral or unitary structure. In the form of the invention illustrated in Figs. 1 to 3, inclusive, the lower edges 15 of the side plates 10 of the blower rest on the bottom 55 of the case. In the particular construction illustrated these parts are joined together by the angle iron 22 which may be suitably joined to the connecting parts. In the case illustrated the angle irons may be welded at 68 to the bottom 55 and may be secured to the side plates 10 by bolts 69, or the like. The front edges 18 of the side plates 10 engage the front wall 57 of the case and may be suitably joined or secured thereto, if desired. Through the joinder of the blower parts to the case the sheet metal side plates 10 of the housing of the blower are braced relative to each other and the blower is given an effective support and at the same time the case is strengthened and reinforced.

An opening 70 is provided in the front wall 57 of the case and the duct portion 38 of the blower housing projects through that opening, and in practice, a suitable connecting flange may be provided to join the blower to the case around the opening 70. In the drawings I have indicated screw fasteners 71 for this purpose. By thus joining the front wall 57 of the case to the housing of the blower I brace the entire case from the blower. The construction just described acts to effectively stabilize or brace the sheet metal box-like case against racking in any direction and accomplishes this without the use of any special

frame structure such as is ordinarily required in a structure of this kind.

The coupling or joinder of the blower and case may be as I have above described, or it may further include a connection between the upper edge portions of the side plates 10 and the top 56 of the case, as shown in Figs. 4 and 5 of the drawings. In these particular figures of the drawings I have shown flanges 21 turned on the upper edges of the side plates 10a and these flanges are secured to the top 56 of the case, with the result that the side plates 10a form direct supports for the top of the case, as well as supporting the front wall of the case.

From the foregoing description it will be apparent that I have, by my present invention, provided a simplified, inexpensive and improved construction. The blower A formed as I have provided, is exceedingly simple and inexpensive of manufacture in that it involves but few simple parts. Likewise, the case is exceedingly simple, as it may include merely the few simple sheet metal parts that I have described. By combining the two simple structures or elements A and B as I have provided, the two elements strengthen and stabilize each other and together form a strong, firm, durable construction. I have, by my present invention, eliminated various frame parts for the case and mounting construction ordinarily required for the blower and have thus lightened the entire structure, and at the same time have minimized the cost of construction.

Having described only typical preferred forms and applications of my invention I do not wish to be limited or restricted to the specific details herein set forth, but wish to reserve to myself any variations or modifications that may appear to those skilled in the art or fall within the scope of the following claims.

Having described my invention, I claim:

1. A blower including spaced substantially rectangular side plates, a curved body joined between the side plates forming a rotor chamber with an outlet opening, corners of the side plates removed from the outlet opening being cut away, a rotor in the chamber, and a motor for driving the rotor mounted at the exterior of the chamber on said structure at the portion thereof where the corners are cut away.

2. A blower including spaced substantially rectangular side plates, a curved body joined between the side plates forming a housing with an outlet opening at its front end, the upper rear corners of the plates being cut away, a rotor in the housing, a motor on the said structure where the corners are cut away and a drive from the motor to the rotor.

3. A blower including spaced substantially rectangular side plates, a curved body joined between the side plates forming a housing with an outlet opening at its front end, the upper rear corners of the plates being cut away, a rotor in the housing, a motor on the said structure where the corners are cut away and a drive from the motor to the rotor, the motor being supported entirely by the upper rear portions of the plates.

4. In combination, a blower including substantially rectangular vertical side plates, a curved body carried between the side plates cooperating therewith to form a rotor chamber, a rotor in the chamber, the upper rear corners of the plates outward of the body being beveled away, a motor at the upper rear corner of said structure and at the outer side of said body, and a drive from the motor to the rotor, and a case around the blower and completely housing the motor, the side plates of the blower being secured directly to the bottom of the case.

5. In combination, a blower including substantially rectangular side plates, a curved body carried between the side plates cooperating therewith to form a rotor chamber, a rotor in the chamber, the upper rear corners of the plates outward of the body being beveled away, a motor at the upper rear corner of said structure outside of the chamber, and a drive from the motor to the rotor, and a case around the blower completely housing the motor, the side plates of the blower being secured directly to the bottom of the case and the front of the blower being secured to the front of the case.

6. In combination, a blower including substantially rectangular vertical side plates, a curved body carried between the side plates cooperating therewith to form a rotor chamber, a rotor in the chamber, the upper rear corners of the plates outward of the body being beveled away, a motor at the upper rear corner of said structure at the exterior of the chamber, and a drive from the motor to the rotor, and a case around the blower housing the motor and drive, the side plates of the blower being secured directly to the bottom of the case, to the top of the case, and to the front of the blower.

7. A blower including spaced substantially rectangular side plates, a curved body, having ends, joined between the side plates and forming a rotor chamber with an outlet opening between said ends, a rotor in the chamber, and a motor for driving the rotor mounted at the exterior of the chamber.

8. A blower including spaced substantially rectangular side plates, a curved body, having ends, joined between the side plates and forming a rotor chamber with an outlet opening between said ends, a rotor in the chamber, a motor for driving the rotor mounted at the exterior of the chamber within planes defined by said side plates.

9. A blower including spaced substantially rectangular side plates, a curved body, having ends, joined between the side plates and forming a rotor chamber with an outlet opening between said ends, a rotor in the chamber, a motor for driving the rotor mounted at the exterior of the chamber, and a case around the blower and completely housing the motor, the side plates of the blower being secured directly to the bottom of the case.

10. A blower including spaced, substantally rectangular side plates, a curved body, having ends, joined between the side plates and forming a rotor chamber with an outlet opening between said ends, a rotor in the chamber, a motor for driving the rotor mounted at the exterior of the chamber within planes defined by said side plates, and a case around the blower and completely housing the motor, the side plates of the blower being secured directly to the bottom of the case.

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