Nov. 10, 1959 H. A. AUSTIN 2,912,195

SUPPORT STRUCTURE FOR A BLOWER HOUSING

Filed Aug. 11, 1958

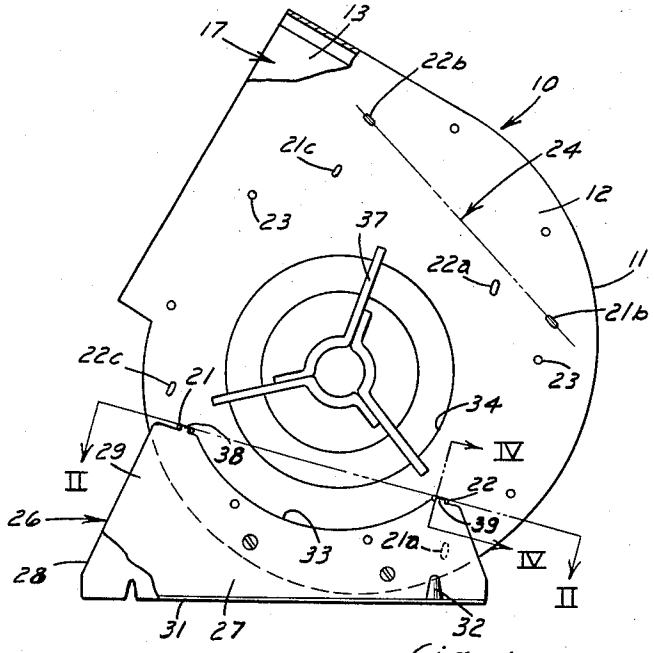


fig. 1

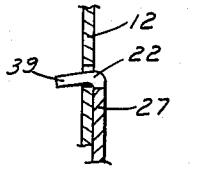


fig. 4

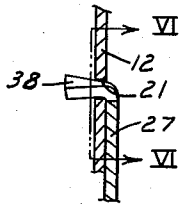


fig. 5

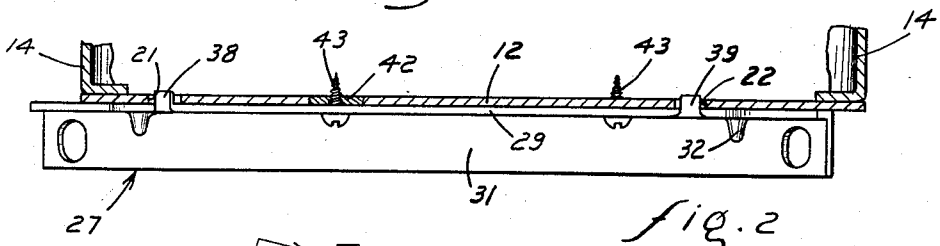


fig. 2

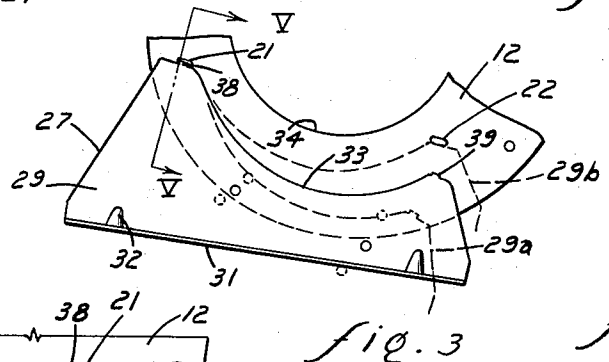


fig. 3

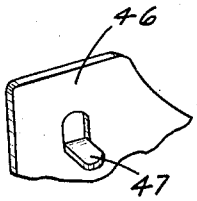


fig. 7

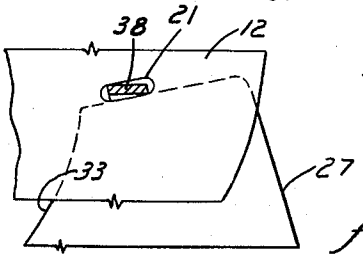


fig. 6

INVENTOR.
HAROLD A. AUSTIN

BY
Woodhams Blanchard and Flynn

ATTORNEYS

United States Patent Office 2,912,195
Patented Nov. 10, 1959

2,912,195

SUPPORT STRUCTURE FOR A BLOWER HOUSING

Harold A. Austin, Kalamazoo Township, Kalamazoo County, Mich., assignor to The Brundage Company, Kalamazoo, Mich., a corporation of Michigan

Application August 11, 1958, Serial No. 754,338

3 Claims. (Cl. 248—23)

This invention relates in general to support structure for a centrifugal blower housing and, more particularly, to a type thereof including a pair of similar foot members, which are preferably mirror images of each other and are connectible to the side sheets of said blower housing in a plurality of corresponding positions.

The production and sale of centrifugal blowers, such as those used for furnace fans, have become highly competitive. Accordingly, manufacturers of such blowers are continually seeking ways of reducing the time required for, hence the cost of, fabricating such blower constructions. In this particular embodiment, reference is made rather specifically to centrifugal blower housings fabricated from sheet metal. However, it will be recognized that the concepts of the invention can be applied in general to housings having cast constructions.

While pursuing the development of an improved support or pedestal structure for a blower housing, it was found that several attempts have been made to provide a pedestal construction including a pair of matched foot members which are mounted upon the blower side sheets. For example, foot members of this general type are disclosed in Patents Numbered 860,465; 2,649,242 and 2,808,981. However, none of the existing structures of this type are suitable to applicant's purposes. In many of these structures, the foot members must be manually held upon their respective side sheets during the assembly operation. With others of such structures, the assembly must be performed with the parts in certain limited positions to avoid manual holding and, even in such cases, it is often necessary to press the foot members against the housing side sheets during the final securing operation. Thus, with most of the existing structures, the assembler must try to hold the foot member on its side sheet while he secures them together by means, such as a screw, a nut and bolt, or by welding. If, during this operation, the foot member is not carefully and continuously held by the assembler, the final product may be defective. That is, the foot member may not be accurately positioned or secured upon its side sheet and, therefore, the foot members may be improperly aligned with each other or with the housing, or where welding is used, for example, they may be so weakly connected to the housing that they will break loose. This situation has resulted in numerous problems, not the least of which are the necessity of depending heavily upon the discretion of assemblers and the delays which result from the exercise of such discretion. Furthermore, there is the inconvenience of manipulating two parts while attempting to secure them together, and the losses which are suffered if the assembly is improper.

In the assembly of centrifugal blowers, particularly of the type used for furnace fans, the exact discharge angle of any selected blower housing is rarely known at the time that the housing is assembled. In fact, it is standard practice to produce the blower housings according to production procedures, stockpile the fabricated housings and then draw from the stockpile to fill orders

calling for a variety of different discharge angles. Accordingly, it is extremely valuable to have a housing and pedestal construction whereby the pedestal can be mounted with respect to the housing to accommodate a variety of different discharge angles. However, it is equally important that the pedestal be adaptable for quick and easy mounting upon the housing. Moreover, where the foot members are used, it is important that the individual members can be quickly and easily secured with respect to the side sheets of the housing without the immediate necessity for using screws or bolts to hold them in place. Thus, it is easier to install the screws, bolts, or other similar devices for effecting a permanent securement of the foot member with respect to the housing and such securement can be accomplished by persons other than those mounting the foot members upon the housing. Furthermore, where the foot members are positively held in the final assembly position with respect to the housing, the chance of an improper positioning or securement is materially reduced, if not eliminated. Also, there is less chance of permanently securing the foot member in the wrong discharge position.

Accordingly, a primary object of this invention has been the provision of a support or pedestal construction for a centrifugal blower housing including a pair of independent foot members, which are mirror images of each other, and cooperating structure on said foot members and the side sheets of said housing whereby each foot member can be positively located and firmly held in a variety of different positions upon and parallel with its side sheet in order to permit the selection of the discharge angle of said blower housing after it is fully assembled.

A further object of this invention has been the provision of a pedestal construction, as aforesaid, wherein said cooperating means for securing said foot members with respect to said housing side sheets includes a pair of ears on each foot member and a pair of corresponding openings in each side sheet of the blower housing arranged so that only one ear at a time can be inserted into the pair of openings and wherein after said ears are inserted into said openings, the foot plate is firmly held with respect to its corresponding side sheet.

A further object of this invention has been the provision of a pedestal construction for a centrifugal blower housing, as aforesaid, which is inexpensive to fabricate, which is very easy to mount upon the finished blower housing in a variety of different positions with respect to said housing and which does not interfere with the performance of the blower assembly of which it is a part.

Other objects and purposes of this invention will become apparent to persons familiar with this type of equipment upon reading the following specification and examining the accompanying drawings, in which:

Figure 1 is a broken side elevational view of a centrifugal blower assembly having an angular discharge and including a pedestal construction embodying the invention.

Figure 2 is a sectional view taken along the line II—II of Figure 1.

Figure 3 is a fragment of Figure 1 showing a foot member in the process of being mounted upon the blower housing.

Figure 4 is a sectional view taken along the line IV—IV of Figure 1.

Figure 5 is a sectional view taken along the line V—V of Figure 3.

Figure 6 is a sectional view taken along the line VI—VI of Figure 5.

Figure 7 is a fragment of the foot member appearing in Figure 1 and showing a modified construction.

For convenience in description, the terms "upper,"

"lower" and derivatives thereof will have reference to the pedestal construction of the invention as appearing in Figure 1. The terms "inner," "outer" and derivatives thereof will have reference to the blower assembly including such pedestal construction and parts associated therewith.

General description

The objects and purposes of the invention, including those set forth above, have been carried out by providing a pedestal construction for a centrifugal blower housing wherein the side sheets of said housing are provided with a plurality of aligned openings arranged in substantially identical pairs and the pedestal is comprised of a pair of similar foot members, each of which has a pair of sidewardly extending ears cooperable with each of said pair of openings in said side sheets. The ears of said foot members are so arranged that, when they are once properly engaged with a pair of openings in said side sheet on the blower housing they tend to hold the foot member snugly against said side sheet and prevent dislodgement from its position parallel therewith. The several aligned pairs of openings in each side sheet are arranged to provide a variety of different discharge angles for the outlet of the housing having said side sheets.

Detailed construction

The centrifugal blower assembly **10** (Figure 1), herein selected to illustrate a preferred embodiment of the invention, is comprised of a blower housing **11** having a pair of preferably identical side sheets **12** and **13**, a scroll sheet **14** and an outlet opening **17**. Each side sheet, such as the side sheet **12** (Figure 1), is provided with a plurality of openings therethrough, which are arranged in substantially identical pairs designated as **21** and **22**, **21***a* and **22***a*, **21***b* and **22***b*, and **21***c* and **22***c*. At least one opening in each pair is out-of-round. In this particular embodiment, all of the openings **21** and **22** are elongated and each pair of such openings, such as the openings **21***b* and **22***b*, has a common lengthwise axis **24**. With each pair of openings **21** and **22**, additional openings **23** are provided for purposes appearing hereafter.

The blower assembly **10** (Figure 1) also includes a pedestal construction **26** comprised of a pair of foot members **27** and **28** (Figure 1), which are preferably exactly similar. The foot member **27** (Figures 1, 2 and 3), for example, is comprised of a flat plate **29** having an integral and sidewardly extending flange **31** along its lower edge, which is preferably substantially perpendicular to said plate. Means, such as the integral gussets **32**, provide rigidity between the plate **29** and flange **31**. The upper edge **33** of the plate **29** is concave to prevent interference with the inlet opening **34** and the bearing support brackets **37** on the side sheet **12**. A pair of integral ears **38** and **39** (Figures 1 and 2) are provided along the upper edge **33** of said plate **29**, preferably near the opposite ends thereof, and preferably extend substantially perpendicularly from the plate **29** in the same direction. Said ears **38** and **39** are substantially wider than thick and have a centerline distance therebetween which is substantially identical to the centerline distance between any one of the pairs of openings **21** and **22** in the side sheet **12**.

One of the ears, here the ear **38** (Figures 5 and 6), is arranged so that its longest transverse axis, if extended toward the other ear **39**, passes to one side of said other ear **39**. On the other hand, the ear **39** is constructed so that its longest transverse axis extends approximately through the center of the ear **38**. Accordingly, the ears **38** and **39** define non-parallel planes. This misalignment can be created either when the ear **38** is bent into its position substantially perpendicular to the plate **29** or by a twisting operation performed upon said ear **38** after it has been bent. As a result of the misalignment, it is impossible to insert simultaneously both the ears **38** and **39** into any one of said pairs of openings **21** and **22**. Accordingly, when the twisted ear **38** is inserted into its

opening **21**, the plate **29** assumes a position somewhere between that indicated in solid lines in Figure 3 and that indicated in broken lines at **29***a* in Figure 3. The plate **29** must then be twisted about the lengthwise axis of the ear **38** until the ear **39** is aligned with, and can be inserted into, the opening **22** whereupon said plate assumes the broken line position **29***b* in Figure 3 or the solid line position of Figure 1.

The plate **29** is provided with a plurality of screw openings **42** at least some of which will be alignable with the openings **23** in the side sheet **12** when the ears **38** and **39** are properly disposed in a pair of the openings **21** and **22**. Screws **43** are then inserted through the openings **23** and fastened into the aligned screw openings **42**.

In this particular embodiment of the invention, the ear **38** is bent out of the plane of the plate **29** into its perpendicular position with respect to said plate so that it and the ear **39** lie substantially within a single plane. The ear **38** is then twisted out of such plane a distance as may be required for the particular installation or metal involved. Accordingly, when the plate **29** is forced from its solid line position of Figure 3 into its broken line position **29***b* the twisted ear **38** is caused to return toward its original non-distorted position. Because of the twist and torque thus imposed upon the ear **38** during the assembly of the foot member **27** upon the side sheet **12**, the lateral edges of the ear **38** and the wall of the opening **21** tend to bite into each other and thereby create distortions in their engaging surfaces which both frictionally and positively oppose disconnection of these parts.

The ear **39** may, if desired, also be bent downwardly slightly as shown in Figure 4 so that it hooks into its opening **22** and requires a positive movement of the foot member **29** transverse of the ear **39** to dislodge the ear **39** from within the opening **22**, hence with respect to the side sheet **12**.

With the foot member **27** thus firmly supported upon the side sheet **12** by means of the ears **38** and **39**, the entire housing assembly including the foot member **27** can be moved from place to place, if reasonable care is exercised in such movement, without dislodging the foot member **27** from its position. Thereafter, the screws **43** may be inserted through the openings **42** and caused to threadedly engage the side walls of the openings **23** in the side sheet **12**. In this manner, the foot member **27** is positively and permanently secured with respect to the side sheet **12**.

The foot member **28**, which may be and preferably is a mirror image of the foot member **27**, may be supported upon the side sheet **13**. The structure of the foot member **28** and its assembly upon the side sheet **13** may be substantially identical with that set forth in detail above with respect to the foot member **27**.

As shown in Figure 7, the side plate **46** of the foot member, such as the foot member **27** of Figure 1, may be provided with ears, such as the ear indicated at **47**, which are notched or struck out of the plate **46** at a point spaced from the edges thereof. Under certain circumstances, this arrangement may prove advantageous in that it improves the rigidity of the temporary holding means and it substantially eliminates the possibility of any movement of the side plate **26** out of its plane adjacent and parallel to the side sheet of a housing upon which the foot member is mounted.

Although particular preferred embodiments of the invention have been disclosed above in detail for illustrative purposes, it will be understood that variations or modifications of such disclosure, which lie within the scope of the appended claims, are fully contemplated.

What is claimed is:

1. In a pedestal construction for a centrifugal blower housing having a pair of parallel side sheets, the combination comprising: a pair of substantially planar and similar side plates, each side plate having a sidewardly extending flange and a pair of spaced and integral posi-

tioning ears extending substantially perpendicularly from said side plate in the same direction, one ear having an out-of-round cross section and said side plate having an opening therethrough spaced from said mounting flange and said ears; means defining a plurality of openings through each side sheet arranged in substantially identical pairs, the centerline distance between the openings in each pair being substantially identical to the centerline distance between the ears on one of said side plates, one opening in each pair being out-of-round and arranged with respect to the other opening so that both of said ears cannot be slidably received simultaneously into a said pair of openings, said one ear being receivable into said one opening in a pair of openings only when the other ear is not in alignment with the other opening of said pair, reception of the other ear into the other opening being effected by twisting said one ear; and means cooperable with said opening in said side plate for engaging the side sheet of said housing when both of said ears are disposed within a said pair of openings.

2. In a pedestal construction for a centrifugal blower housing having a pair of parallel side sheets, the combination comprising: a pair of substantially planar side plates which are mirror images of each other, each side plate having a sidewardly extending flange and a pair of spaced and integral ears extending substantially perpendicularly from said side plate in the same direction, one ear having a non-circular cross section and both of said

ears being spaced from said flange; means defining a plurality of aligned openings in said side sheets, at least some of the openings in each side sheet being arranged in substantially identical pairs, the centerline distance between the openings in each pair being substantially equal to the centerline distance between the ears on each side plate, one opening in each pair having a non-circular cross section arranged to slidably receive said one ear when, and only when, its side plate is substantially parallel to the side sheet and the other ear is out of alignment with the other opening of said pair, reception of the other ear into the other opening of said pair being effected by twisting said one ear with respect to its side plate, whereby said side plate is held snugly adjacent and parallel to its corresponding side sheet; and means including openings through each side plate and its corresponding side sheet, which openings are aligned when said ears are received into a pair of said openings, for securing said side plate with respect to its side sheet.

3. The structure of claim 2 wherein both openings in each pair of openings in said side sheets are elongated and have a common lengthwise axis; and wherein said one of said ears has an elongated cross section, the extended lengthwise axis of which passes substantially to one side of said other ear.

No references cited.