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FAN ASSEMBLY

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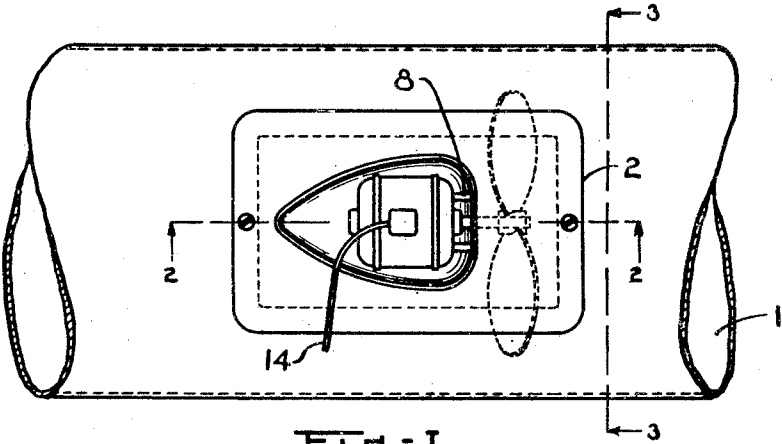


Fig. I

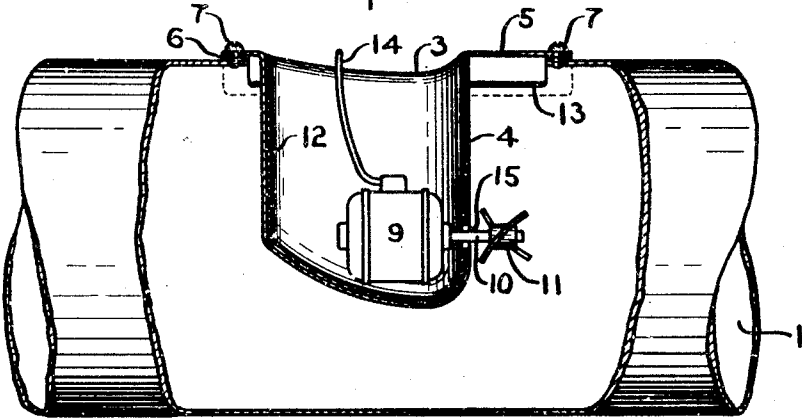


Fig. II

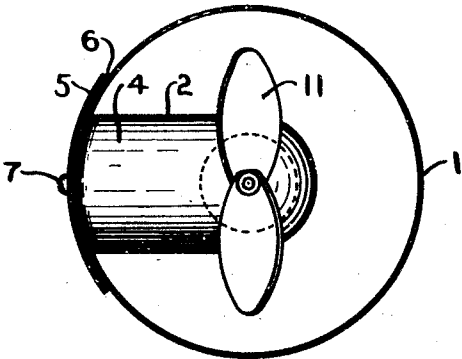


Fig. III

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FAN ASSEMBLY

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3 Claims. (Cl. 230—117)

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The present invention relates broadly to fluid circulating apparatus, and in its specific phases to an apparatus adapted for insertion in a duct for increasing the rate of flow of hot or cold gaseous fluid through same.

Fan and motor assemblies have been proposed for use in hot or cold air pipes of furnaces, but all of such assemblies have consisted of a motor and fan suspended directly in the path of flow of air in the pipe. Where the assembly is used in a hot air pipe, the heat gradually thickens the oil in the motor bearings and in due time decreases the speed and utility of the motor. Movement of air directly over the motor causes dust to be deposited on same, and this is extenuated where the parts are oily from the bearing oil or the like. This dust is a heat insulator and accordingly, the motor gradually increases in temperature in use and finally clogs up and burns out or stops if allowed to run too long. The present invention was discovered and developed as a result of recognizing the short comings and difficulties of the prior art in this fluid circulation field.

Accordingly among the objects of the present invention is the production of a booster fan assembly which is insertable into a duct or chamber without the motor of the assembly being exposed to the direct flow of fluid in such duct or chamber.

Another object is to provide a substantially hat shaped housing for insertion into a duct through the side thereof, such housing containing a motor with fan mounted on the shaft of same, the fan being outside of the housing.

Another object is to provide a substantially hat shaped housing for insertion into a duct through the side thereof, such housing having a motor mounted therein with the shaft of the motor extending through the side of the housing and carrying a fan thereon, such opening through the housing normally being a little larger than the shaft to allow cooling air to flow over the motor and through the opening into the duct under suction effect of the fan.

A further object is to provide a substantially hat shaped housing for a fan motor, said housing being insulated to protect the fan motor from hot or cold fluid flowing around the outer surface of the housing.

A further object is to provide a booster fan assembly particularly adapted for use in hot air pipes where the fan motor is in a substantially hat shaped housing and exposed to outside air where it is kept cooler and cleaner in operation,

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and at the same time is readily accessible for oiling, cleaning, and inspection.

A further object is to provide a hat shaped housing for a booster fan assembly, wherein said housing acts as a support for a fan motor, protects the motor, and the brim shaped flange on the housing provides means for mounting the whole assembly in a suitable hole in the side of a duct or chamber.

A still further object is to provide a highly efficient booster fan assembly which is simple in construction, easily made, and readily installed and serviced.

Still further objects and advantages of the present invention will appear as the description proceeds.

To the accomplishment of the foregoing and related ends, the invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims, the annexed drawing and the following description setting forth in detail certain means for carrying out the invention, such disclosed means illustrating, however, but one of various ways in which the principle of the invention may be used.

In the annexed drawing—

Figure 1 shows a plan view of a preferred form of the present invention as installed in a suitable duct.

Figure 2 shows a partially sectioned assembly view as taken along line 2—2 of Figure 1 looking in the direction of the arrows.

Figure 3 shows an end view of the assembly as taken along line 3—3 of Figure 1 looking in the direction of the arrows.

Referring more particularly to the drawing, the duct 1 is shown with a preferred form of the booster fan assembly 2 mounted in place. A conventional form of this assembly consists of a substantially hat shaped housing 3 which has an open ended hollow body member 4 and a flange-like brim member 5. This brim member will normally be curved to fit the contour of the duct, and where the duct is rounded as diagrammatically illustrated in the drawing, the brim member will be likewise rounded. The invention, however, is not limited to use with round ducts and the showing of same is to be considered as diagrammatic of the various constructions where-in the present invention may be used.

In order to tightly seal the booster fan assembly in the duct, a gasket 6 of conventional construction suitable to the conditions involved, may be used under brim member 5 and the whole as-

sembly held in place by means of screws 7 or the like.

Mounted in body member 4 of the booster fan assembly 2 by means of supporting members 8 or the like, is an electric motor 9 which has an elongated shaft 10 on which is mounted a propeller 11 outside of body member 4. The opening 15 through body member 4 for shaft 10 may be of a sealed construction, but where the assembly is used in a furnace hot air duct, this opening is preferably somewhat larger than the shaft so that the suction created by operation of the motor and fan will draw air through the housing where it flows over the motor and through the opening into the duct so as to keep the motor relatively cool. The body member 4 is also preferably lined with suitable insulation 12 to further aid in protecting the fan motor from the heat of the fluid flowing through the duct.

To install the assembly, a hole 13 of suitable size is cut in the side of duct 1 so as to allow the protruding propeller and body member 4 of housing 3 to pass therethrough. The brim member 5 is also made of a suitable shape and width to adequately seal the opening when the assembly is fastened in place. In preferred construction housing member 4 is made as small as possible to reduce obstruction to fluid flow through the duct 1 and may be in the form of a streamlined construction stamping as shown. The electric motor is provided with an electric cord 14 which connects same to a suitable source of electricity so that the electricity for operating the motor may be turned on and off automatically or manually as desired. In preferred construction the propeller 11 will be mounted for rotation substantially on the longitudinal axis of the duct 1, as diagrammatically illustrated in the drawing, although the invention is not limited to the mounting of the propeller in this same exact location.

Where the fluid to be circulated through duct 1 is hot, the hat shaped housing 3 is preferably either mounted with its open end up or inclined sidewise so as to permit the direct rising of any heat passing from the interior of the duct into the inside of body member 4, as well as heat generated due to the operation of the motor. This allows natural cooling of the motor by flow of air from the room over same in addition to the air drawn through the housing and into the duct through the small opening 15 around motor shaft 10. On the other hand if the fluid flowing through duct 1 is abnormally cold so as to adversely affect the motor, then the housing would preferably be installed with open end downward so as to allow the cold air to flow out of the housing and to allow the heat generated by the motor to be pocketed and thus cause it to operate under more favorable working conditions. The invention, however, is not limited to the mounting of the assembly in a duct or chamber in this manner since may be mounted in various ways meeting the requirements of the particular situation involved.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:

1. A circulating fan assembly for insertion in an opening through the wall of a duct or the like, 75

which consists of a hat shaped housing member which has a streamlined hollow body member closed at one end and open substantially full size at the other and an outwardly extending brim-like flange at the open end of said housing, said brim-like flange being adapted to coact with and close the opening through the wall of said duct or the like, an electric motor, means within said housing member for fastening said electric motor to the latter and wholly within same, said motor having a shaft extending through the wall of said body member, and a propeller mounted on said shaft outside of said body member, whereby the open end of said housing member permits natural circulation of air or the like to said motor to heat condition same while permitting said housing to be relatively small and short so as to produce a minimum obstruction to the flow of fluid around said housing member.

2. A booster fan assembly for insertion in an opening through the wall of a duct or the like, which consists of a hat shaped housing member which has a hollow body member closed at one end and open substantially full size at the other and an outwardly extending brim-like flange at said open end, said brim-like flange being adapted to coact with and close the opening through the wall of said duct or the like, an electric motor, means for mounting said motor wholly within said hollow body member and supporting same on the latter with the shaft of said motor extending through the wall of said body member, and a propeller mounted on said shaft outside of said body member.

3. A booster fan assembly for insertion in an opening through the wall of a duct or the like, which consists of a hat shaped housing member which has a hollow body member closed at one end and open substantially full size at the other and a brim-like flange extending outward therefrom at said open end, said brim-like flange being adapted to coact with and close the opening through the wall of said duct or the like, a gasket between said brim-like flange and the face of the duct which it overlies, an electric motor, means for mounting said motor wholly within said hollow body member and supporting same on the latter with the shaft of said motor extending through the side wall of said body member, the opening through said hollow body member for said shaft being substantially larger than said shaft so as to permit limited flow of fluid over said motor due to the operation of said propeller, a layer of heat insulation material for said hollow body member, and a propeller mounted on said shaft outside of said body member.

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