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ELECTRIC MOTOR, PUMP AND BLOWER OIL BURNER UNIT

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FIG 1

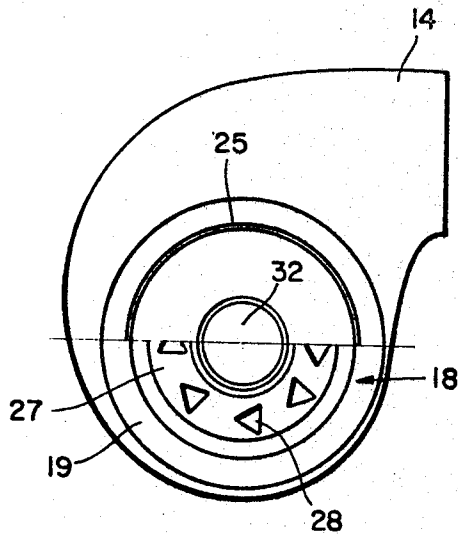
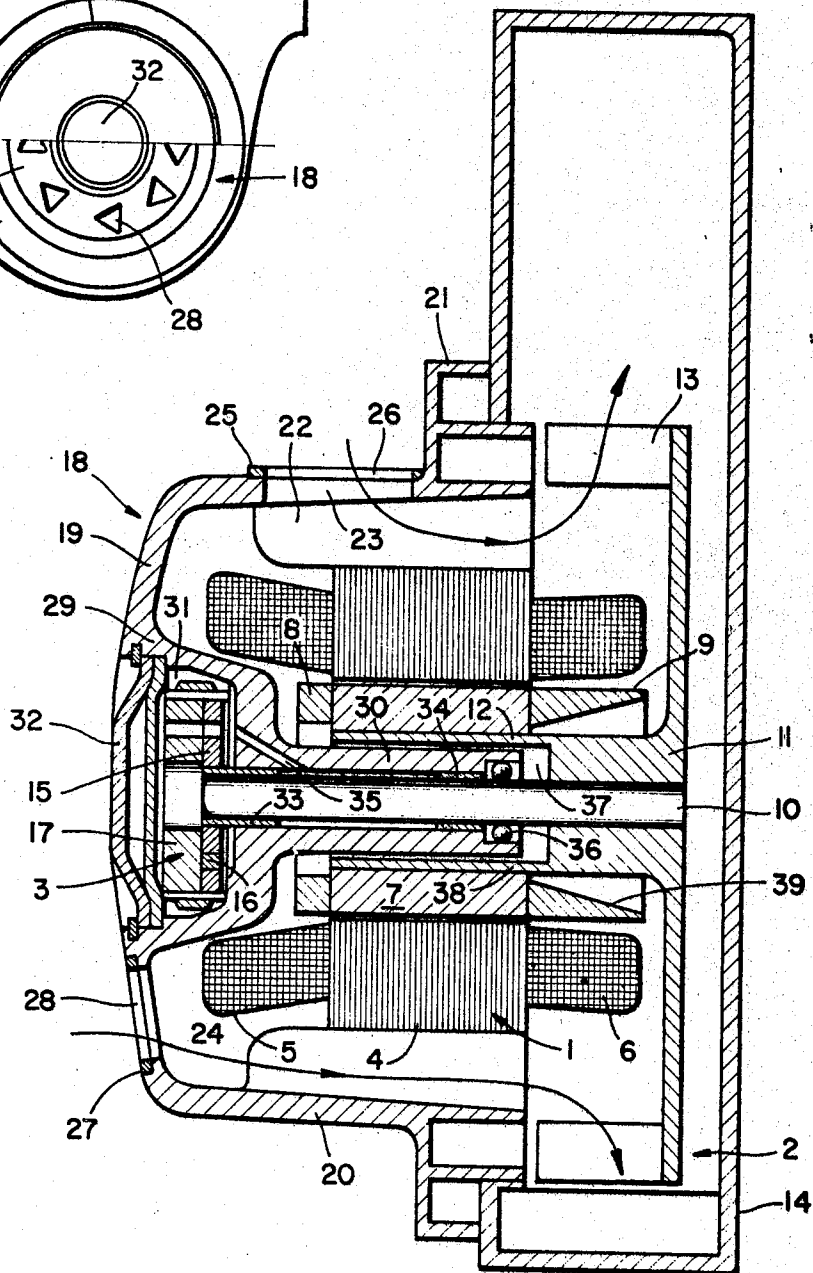


FIG 2



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ELECTRIC MOTOR, PUMP AND BLOWER OIL BURNER UNIT

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10 Claims

ABSTRACT OF THE DISCLOSURE

The invention relates to an electric motor, pump and blower oil burner unit having a simple casing design which provides several advantages. A cup shaped casing is provided for the electric motor which is recessed at the closed end thereof to provide a housing for the pump unit. A blower housing attaches directly to the open end of the casing. The casing is provided with air openings through which air is drawn by the blower to cool the motor and to provide preheated air for the blower. The motor stator is spaced from the internal wall of the casing so that air drawn into the casing completely surrounds the stator to provide more efficient cooling. The casing an integral hub portion which rotatably supports a shaft to which the pump means, the blower wheel and motor rotor are attached.

This invention relates to a burner unit, consisting of an electric motor, a pump and a blower, as used, for example, for oil-firing systems.

It is known to flange the electric motor to one side of the blower housing and the pump to the other side. This requires a complicated pump housing, since, on the one hand, it is necessary to cater for numerous possible ways of attaching this housing, while, on the other hand, only a limited surface of the housing is available for the entry of the air from the blower. The blower is only accessible if the pump or motor is removed. No provision is made for cooling the motor.

The object of the invention is to provide a burner unit of the abovedescribed kind which is much simpler in construction, wherein the motor is intensively cooled, wherein the pump and blower are readily accessible, and which occupies a very small amount of space.

The invention is characterized by a cup-shaped housing, which surrounds the motor at same distance therefrom, is open at the side facing the blower, carries the pump at the base of the cup, positioned at the opposite end of the motor, and has in its base or circumferential walls, at least one orifice for the entry of the air from the blower.

With the help of this one cup-shaped housing, the electric motor, pump and blower are assembled to form one unit in an extremely simple manner. The blower and the pump are positioned at both sides of the motor, so that the bearing of the latter is uniformly loaded. The cup-shaped housing also passes the air from the blower past the motor in such a way that the latter is intensively cooled, while, on the other hand, the blower air is preheated. Numerous steps are possible for further simplifying the construction of this unit and for rendering the construction more compact.

In a preferred embodiment, the housing is arranged to surround the free surface of the stator-plate pack at some distance therefrom, is provided with a retaining device, e.g. a web, for supporting the stator, and supports at its base a shaft bearing extending towards the open side. In this construction, a separate housing for the motor is completely unnecessary. The stator-plate pack can be

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supported on the cup-shaped housing direct, either by webs engaging the periphery of the pack, or by the screws, holding the pack together, being connected to the cup-shaped housing by means of fish-plates. Due to the absence of a separate housing for the motor, the cooling of the motor is still more intensive. Since, in principle, cooling takes place when the motor is running, the motor can be more heavily loaded, i.e. a smaller size of motor can be used.

A still simpler form is obtained if the housing, webs and shaft bearing are formed in one piece. The shaft bearing is then simply an extension of the base of the cup. The one component thus performs a large number of functions.

For the purpose of stiffening the base of the cup, it is expedient for this to project in the middle towards the open side and for the shaft bearing to be adjacent this projection. Furthermore, the pump can be accommodated in the recess on the outside of the base resulting from the projection. This results in considerable shortening of the unit in the axial direction. This is particularly true since the projection extends into the adjoining coil-head. Thus the space available is utilized in the best possible way.

Advantageously, the rotor surrounds the shaft bearing at least partially, and is secured to the shaft by means of a sleeve. In this way, a long bearing is obtained which is well able to carry all the loads that occur.

A further simplification is achieved by mounting a bush on the shaft, this carrying the sleeve for the rotor as well as the blower wheel. Here, bush, sleeve and blower wheel may even be made as one piece.

Oil leaking from the pump can be used for lubricating the shaft bearing. It is of advantage to provide at least one orifice in the rotating parts through which the oil can pass to the blower compartment. Then, there is no trouble if the lubricating oil escapes from the shaft bearing, since this oil is then propelled into the firing compartment with the air from the blower.

In this connexion, guide surfaces can be formed on the short-circuit ring of the rotor, these surfaces imparting an axial component of movement to the oil emerging from the orifice. The oil is caused to pass by the coil-head by the guide surfaces. Also, it is possible to shift the outlet orifices for the oil close up to the rotor-plate pack, so that the bush for securing the rotor and the blower wheel can be moved quite a distance towards the shaft bearing, whereby further shortening in the axial direction is possible.

It is also advantageous if the orifices in the housing for admitting the air from the blower are provided, in known manner, with adjustable baffles. This makes it possible to regulate the amount of air from the blower to suit local operating conditions.

The invention will now be described in more detail by reference to an embodiment illustrated in the drawing, wherein:

FIG. 1 shows a longitudinal section through a burner unit according to the invention, wherein the orifices for admitting the air are provided in the upper part on the periphery, and, in the lower part, in the base, and

FIG. 2 shows, on a reduced scale, an end-view of the embodiment seen in FIG. 1.

The burner unit illustrated consists of a motor 1, a blower 2 and an oil-pump 3. The stator-plate pack 4 of the motor, together with two coil-heads 5 and 6 and the rotor 7 with the short-circuit rings 8 and 9 can be seen, as well as a shaft 10. The rotor 7 is connected to the shaft 10 by means of a bush 11 which extends into a sleeve 12.

The bush 11 also carries a blower wheel 13 plus vanes. This wheel 13 is surrounded by a blower housing 14.

The pump 3 takes the form of a gear-pump, and its rotor

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15 is mounted on the opposite end of the shaft 10 and cooperates with a stator 16 and a housing 17 having supply and discharge pipes.

A cup-shaped housing 18 has a base 19, a circumferential wall 20 and a flange 21 at the open end, to which flange is secured the blower housing 14. Radially extending webs 22 on the circumferential wall directly engage the plate-pack 4 of the stator and thereby hold the stator firmly in position. Orifices 23 can be provided in the circumferential wall 20 or orifices 24 in the base 19 for admitting the air from the blower. The orifices 23 can be partially closed by means of a cylindrical baffle 25 containing openings 26, and the orifices 24 can be partially closed by an annular baffle 27 containing openings 28.

The base 19 has a projection 29 which extends into the coil-head 5. A shaft bearing 30 forms an extension of this projection 29 on the base. The projection forms a recess 31 in which the pump is accommodated in a space-saving manner. This recess can be closed by means of a plate 32. The shaft bearing 30 contains two bearing bushes 33 and 34. A passage 35, for leaking oil, leads from the pump 3 to the space between the bearing bushes 33 and 34. A sealing member 36 is provided at the point where the shaft 10 emerges from the shaft bearing 30. If, despite this, oil finds its way into the compartment 37 outside the sealing member, this oil is flung outwards through an orifice 38 into the sleeve 12. It strikes a guide surface 39 on the short-circuit ring 9 and this causes it to by-pass the coil-head 6. The oil then passes into the sucked-up air from the blower and is carried along into the firing compartment.

I claim:

1. An oil burner unit comprising a cup-shaped casing having an open end and a closed end and a central axis, an electric motor stator fixedly mounted in said casing in spaced relation to the internal surface of said casing, an electric motor rotor rotatably mounted in said casing, a blower housing attached to said open end of said casing, a blower wheel disposed in said blower housing, said closed end of said casing forming a recess for housing a pump, pump means disposed in said recess, a hub portion extending inwardly from said recess of said closed end of said casing, said hub portion having an axially extending bore forming a shaft bearing, said housing defining openings therein through which air is drawn by said blower to cool said electric motor and provide preheated air for said blower.

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2. An oil burner unit as defined in claim 1 wherein said hub portion is an integral part of said casing.

3. An oil burner unit as defined in claim 1 including a shaft journaled in said bearing, said shaft being connected to said pump means.

4. An oil burner unit as defined in claim 1 wherein the end of said stator opposite said blower housing is in at least partially surrounding relation to said recess formed in said closed end of said casing.

5. An oil burner unit as defined in claim 3 including a sleeve member surrounding said hub portion and being attached to said shaft, said electric motor rotor being connected to said sleeve member.

6. An oil burner unit as defined in claim 5 wherein said blower wheel is connected to said sleeve member.

7. An oil burner unit as defined in claim 6 wherein said sleeve member is an integral part of said blower wheel.

8. An oil burner unit as defined in claim 5 wherein oil passages are provided in said closed end of said casing and in said hub portion for lubricating said bearing and at least one oil passage is provided in said sleeve member through which oil internally of said sleeve member passes to the interior of said blower housing.

9. An oil burner unit as defined in claim 8 in which an annularly shaped short circuit ring is connected to the blower side of said electric motor rotor, said short circuit ring having guide means internally thereof in fluid communication with said oil passage in said sleeve member for receiving oil from said last mentioned passage and imparting thereto an axial movement component.

10. An oil burner unit as defined in claim 1 including adjustable baffle means for said housing openings.

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