Dec. 3, 1929. F. T. BOGARD 1,737,912

ROTARY HEATING DEVICE

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Fig. 1

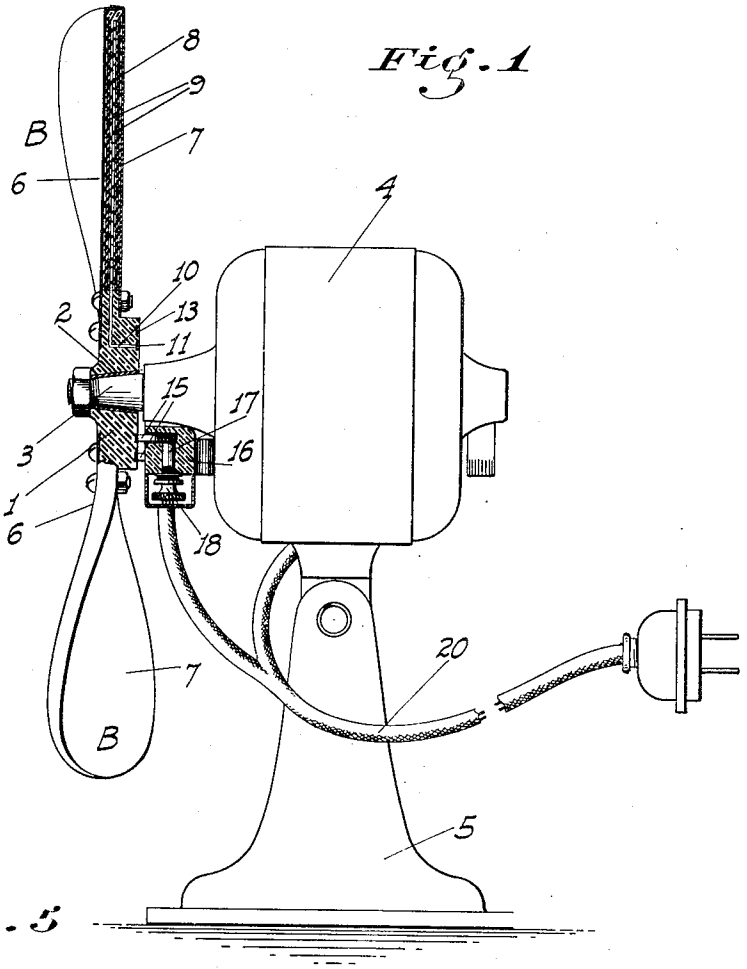


Fig. 3

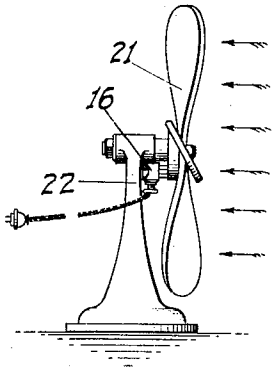
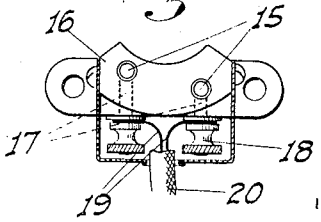


Fig. 4



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Fig. 2

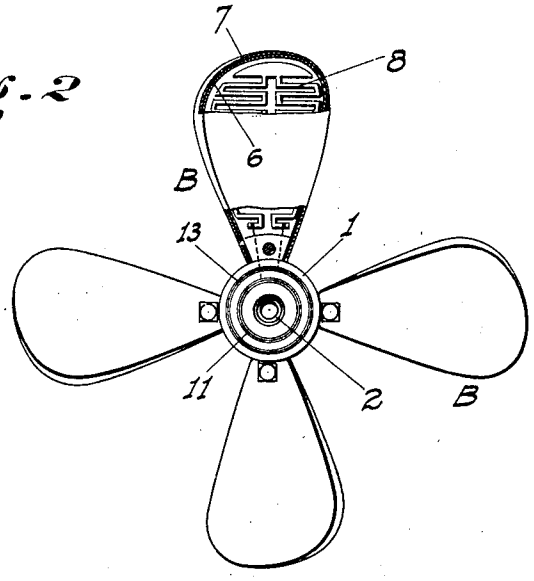
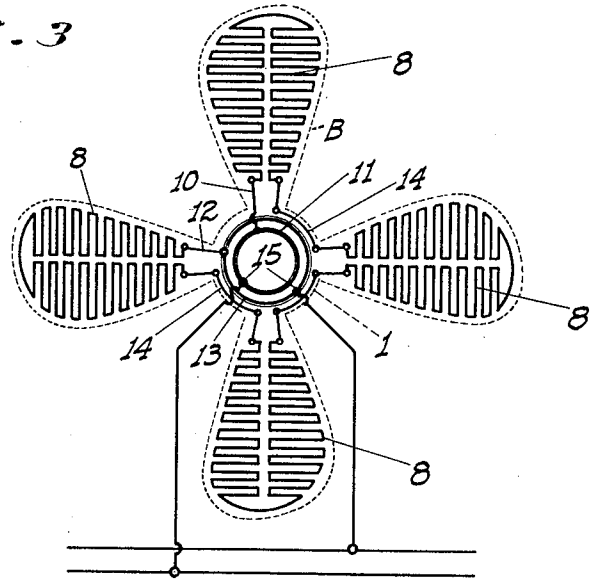


Fig. 3



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1,737,912

UNITED STATES PATENT OFFICE

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ROTARY HEATING DEVICE

Application filed January 9, 1928. Serial No. 245,411.

This invention relates to electric heating appliances, and particularly to one of a portable type which may be placed anywhere in a room to be heated, in the same manner that the present portable electric heaters are used.

The principal object of my invention is to combine as a single unit a fan and electric heating elements inclosed within and arranged to heat the blades of the fan. As a result of this construction the entire area of the blades on both sides are kept heated to the same even degree, so that the heat will be transmitted to all the air coming in contact with the surfaces of the blades; whether such air is being drawn toward one face of the blades by the suctional effect set up by the rotation of the fan, or is being drawn away from the other face of the blades. Since the fan, of course, is intended to be rotated, the desired circulation of air in the room is had without depending upon the naturally small current of air set up merely by the contact of the air with the heated surfaces. My improved heating device is therefore very effective to heat a room in a minimum of time and with the consumption of a minimum of current.

A further object of this invention is to provide a device of this character which may be applied to any fan motor in place of the usual fan; which may be put out as a complete unit with its own motor, or arranged as a self-supporting but motorless fan to be rotated by a current of air induced by the operation of another ordinary fan disposed in proper relation to the heating fan.

A further object of the invention is to produce a simple and inexpensive device and yet one which will be exceedingly effective for the purpose for which it is designed.

These objects I accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings similar characters of reference indicate corresponding parts in the several views:

Fig. 1 is a side elevation of a combined heating fan and motor unit, partly in section.

Fig. 2 is a front elevation of the fan member detached, partly broken out.

Fig. 3 is a diagrammatic view of the heater arrangement and circuit.

Fig. 4 is a face view of the fixed contact block.

Fig. 5 is a side elevation of a non-driven heating fan unit.

Referring now more particularly to the characters of reference on the drawings, and particularly at present to Figs. 1 to 4, 1 denotes the hub of the fan, preferably made of insulation material and having a central bore surrounded by a metal bushing 2, to receive the shaft 3 of a standard electric fan motor 4, which motor is mounted on the usual portable stand 5.

Any number of blades B of any desired area and pitch are mounted on the hub, each blade comprising a pair of transversely spaced members 6 and 7 arranged to form a hollow airtight chamber therebetween for the reception of the heating elements. The hub is preferably bakelite or similar material, which may be moulded with the metal parts already in place therein, and the blade members 6 may therefore be permanently mounted on the hub in this manner, while the cooperating members 7 may then be detachably fitted on to the members 6 as the heating elements are mounted in place.

The heating elements 8 are preferably of the flat-plate type used in electric flat irons, are shaped to conform to the peripherial curvature of the blades and chambers therein, and are mounted in said chambers with layers of insulating but heat conducting material 9 on both sides thereof. Sheets of mica are preferably employed as the insulating medium, as such material has excellent insulating properties and is very light. The elements therefore do not contact with the blades but the heat therefrom is transmitted evenly to the entire area of the blades as will be evident, since the size of the elements approaches that of the blades themselves.

The elements are preferably arranged in series in a circuit, one terminal of one blade

is connected by a wire 10 with a contact ring 11 which is mounted in the hub concentric with the motor shaft and on the face nearest the motor, while the opposite terminal of an adjacent element is connected by a wire 12 to another contact ring 13, also mounted on the hub concentric with the ring 11. The remaining terminals of the different elements are connected to each other by wires 14. The wires 10, 12 and 14 are all imbedded and moulded in the hub during the manufacture of the latter, and are connected to the respective heating elements when the latter are inserted by brazing or the like.

Contact of the rings with a source of current is made by means of a pair of spring pressed contact pins 15 to engage the respective rings, which pins are mounted in insulated relation to each other in a block 16 which is adapted to be secured on the motor casing. Posts 17 operatively connect with the pins and project to the outer faces of the block. The outer ends of these posts are provided with binding nuts 18 for engagement with the ends of wires 19 which branch from an extension cord 20 from which current is supplied to the motor.

If it is desired to use the fan for ordinary air circulating purposes without providing any heat, it is only necessary to disconnect the wires 19 from the nuts 18, in which case only the motor will be driven and the heating elements will not receive any current.

In Fig. 5, the device is shown as constituting a fan member 21, having the heating elements mounted therein as described above. This fan, however, is mounted directly on a stand 22 without any motor, the contact pin block 16 being also mounted on the stand. In this case the fan is driven indirectly by the air currents set up with the operation of an ordinary electric fan disposed in a proper position relative to the fan.

It is to be noted that the main vital feature of this invention is the enclosing and sealing of the heating elements within the blades so that no air can get to or blow on the elements, and thus impair the efficiency of the device.

It is also to be noted that while I have described a certain method of making and assembling the blade elements, other methods to attain the same end may be employed. Also, the form of element may be changed, as well as the wiring arrangement, from what has been shown and described.

From the foregoing description it will be readily seen that I have produced such a device as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described my invention what I claim as new and useful and desire to secure by Letters Patent is:

1. A heating fan comprising a hub member, fan blades each consisting of a pair of spaced and separate cooperating sections mounted on the hub; one of said sections being removably secured to the hub and to the other section, and an electric heating element disposed between the sections.

2. A heating fan comprising a hub member of insulation material, fan blades mounted on the hub, heating elements in the blades, spaced contact rings mounted in the hub, and leads embedded in the hub and connected in series to the heating elements and to the rings.

3. A heating fan including a driven shaft means supporting the same, a hub removably mounted on one end thereof, fan blades mounted on the hub, heating elements mounted in the blade spaced annular contact rings secured on the face of the hub opposite to the said end of the shaft and to which the elements are connected, and members engaging the rings mounted on said shaft supporting means.

4. A heating fan including a driven shaft means supporting the same, a hub removably mounted on one end thereof, fan blades mounted on the hub, heating elements mounted in the blade spaced annular contact rings secured on the face of the hub opposite to the said end of the shaft and to which the elements are connected, yieldable members engaging the rings, and a block in which said members are mounted, secured on said shaft supporting means.

5. In a fan, the combination as a single unit, of a blade of the fan, and an electric heating element hermetically sealed within the blade.

6. In a fan, the combination as a single unit, of a blade of the fan, having spaced walls arranged to form an airtight chamber, and an electric heating element enclosed between said walls.

In testimony whereof I affix my signature.

FRANK T. BOGARD.