

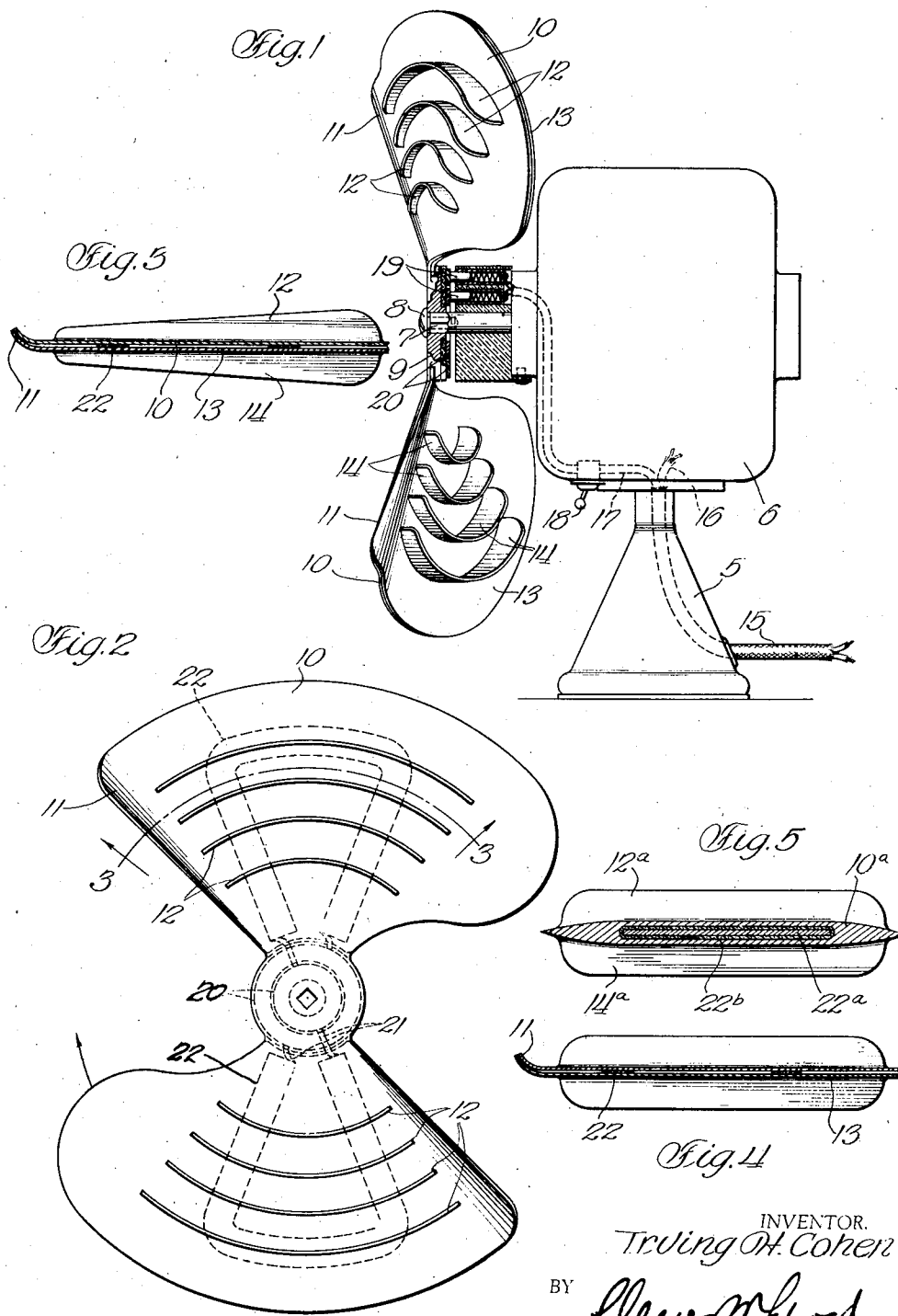
March 8, 1938.

I. H. COHEN

2,110,621

FAN

Filed Feb. 8, 1935



INVENTOR
Irving H. Cohen
BY *Clayton M. Shost*
ATTORNEY.

UNITED STATES PATENT OFFICE

2,110,621

FAN

Irving H. Cohen, Chicago, Ill., assignor to Thermal Units Manufacturing Company, Chicago, Ill., a corporation of Illinois

Application February 8, 1935, Serial No. 5,518

10 Claims. (Cl. 219-42)

The invention relates to fans and more specifically to fans for heating air that is to be circulated.

5 The principal object of the invention is to provide a fan with heating elements and means to facilitate the rapid transfer of heat from such elements.

10 A further object of the invention is to provide fan blades with fins to aid the transfer of heat from heating elements secured thereon.

A further object of the invention is to provide a fan with heating elements and additional heat transferring surface without lowering the efficiency of the fan.

15 Other objects and advantages of the invention will be more apparent from the following description, wherein reference is made to the accompanying single sheet of drawing, hereby made a part of this specification, and upon which—

20 Figure 1 is a side elevation of a motor driven fan, partly in section, embodying one form of the invention;

25 Figure 2 is a front elevation of the fan blade member shown in Figure 1 detached from the motor;

Figure 3 is a section, partly broken away, on line 3-3 of Figure 2 showing one form of a radiating fin which may be used upon the fan;

30 Figure 4 is a similar view of a second form of a radiating fin; and

Figure 5 is a transverse section across a cast blade which may be substituted for the fabricated blade illustrated in the preceding figures.

35 By way of illustration of the invention, there is shown in Figure 1 a suitable pedestal or base 5 supporting a motor casing 6. A motor of a conventional type contained within the casing 6 propels a motor shaft 7.

40 Attached to the end of the shaft 7, by means of a suitable clamping screw 8, or otherwise suitably secured thereto, is a fan blade supporting hub 9. Integral with the hub 9 (or if preferred, attached thereto) are fan blades 10 curved outwardly along one edge to form an impelling lip 11. Integral with or attached to, as preferred, and protruding forwardly from the face of the blades 10 are radiating fins 12 arranged concentrically with respect to the propelling shaft 7.

50 While there is illustrated two diametrically opposed blades 10, radiating fins 12, and supporting hub 9, all cast as an integral member, it will be apparent that the agitating or circulating unit may be constructed in other manners. The blades 10 may be of any suitable different con-

figuration, pitch or number. The blades illustrated are of a popular type. The radiating fins likewise may be of any desired configuration or number. Those shown, four on each blade, are of a streamlined type as more clearly illustrated in Figure 3. The continuous width type shown in Figure 4 may be used with equal facility.

5 Secured in a suitable manner upon the backs of blades 10 are transversely spaced members 13 of complementary configuration to fan blades 10, arranged to form with said blades a space wherein heating elements are disposed and enclosed. Integral with transverse members 13 are radiating fins 14 of a shape and arrangement similar to fins 12 on blade 10. Fins 14 may be in alignment with fins 12 at the opposite side of the circulating member. The purpose and utility of the fins will be hereinafter described.

20 The heating means shown in Figure 2 and the motor shown in Figure 1 have a common source of electrical supply 15. The conduit 15 branches to energize the motor through conduit 16 and to energize the heating elements through conduit 17. Conduit 17 has therein a switch 18.

When the switch 18 is closed, current passes 25 through conduit 17 into contacting brushes 19 of the usual type. Brushes 19 maintain a constant electrical contact with contact rings 20. From these rings, current passes into conduits 21 and into the heating elements 22 which may be of the common resistance type, generally used in electric flat irons. The heating element shown is of a horseshoe form, but it is obvious that any other desired shape may be used. Other means for establishing a circuit to the heating elements 35 may be substituted for the arrangement shown.

The heating elements 22 are in the space between fan blades 10 and members 13. Such elements are electrically insulated from the blades 10 and members 13 by an insulating paste or in 40 any other manner which allows heat conductivity from the elements 22 to the bodies of the blades 10 and members 13. Such heat travels by conductivity through the blades 10 and members 13 and into the fins 12 and 14 and is radiated 45 from the blades, the members, and the fins on such blades and members.

50 Heretofore it has been the practice to rely entirely upon the surface of the fan blades to radiate heat from the source of heat supply in association therewith. In the present device, transmission of heat to air is facilitated by adding radiating fins at the front and at the back of the blades. Such fins are so arranged that they describe a circular path when rotating.

The fan blades pick up such heated air and add to such heated air the air heated by the blades themselves. The blades force such heated air out and away therefrom in a steady and smooth stream. The fins provide means to multiply many fold the heat radiating surfaces of the fan blades without interfering with, or lowering, the efficiency of the fans to circulate air.

The effect of the fins upon the air current apparently is to increase the air circulation and to drive the air in a more definite course. Generally the fins have the sides of their elongated flat bodies concentric with the axis of rotation of the motor and the fan blades, but eccentricity of the fins may be substituted when desired. Ordinarily such eccentricity is slight and does not seriously reduce the speed of the fan.

In Figure 5, a blade is illustrated which comprises a heating element 22a encased in insulation 22b and about which the blade body 10a is cast. Fins 12a and 14a are integral with the body 10a. This structure for the fan may be substituted for that heretofore described and is effective for all practical purposes.

One embodiment of the invention only is described. It will be apparent that many and various other forms of construction may be employed to produce a larger radiating surface. There is no desire to limit the invention to the disclosed form thereof for it is contemplated that many changes or modifications may be made without departing from the spirit of the invention.

What is claimed as new and is desired to be secured by Letters Patent of the United States is:

1. In an air circulating fan, a blade having heating means and formed with an air propelling surface, and fins on said blade having elongated bodies arranged transversely of the air propelling surface of said blade.
2. In an air circulating fan, a blade having an air propelling surface and rotatable about an axis, and fins on said blade having elongated bodies concentric with such axis and transverse of the air propelling surface of said blade.
3. An air circulating fan comprising a blade of heat conductive material, a heating element electrically insulated from and heat conductively attached to said blade, and fins materially increasing the heat transferring surface of said blade in heat conductive relationship with said blade.
4. An air circulating fan comprising a blade of heat conductive material having an air impelling surface, a heating element electrically insulated from and heat conductively connected to said blade, and fins materially increasing the heat radiating area of said blade in heat conduct-

ing relationship therewith and arranged transversely of the air impelling surface thereof.

5. An air circulating fan comprising a blade of heat conductive material having an air impelling surface and rotatable about an axis, a heating element electrically insulated from and heat conductively connected to said blade, and fins with elongated bodies concentric with such axis materially increasing the heat radiating area of said blade in heat conducting relationship therewith and arranged transversely of the air impelling surface thereof.

6. A blade for a fan comprising a heating element, an electrical insulating sheathing over said element, said sheathing being heat conductive, and a blade body of cast material over said sheathing in physical contact therewith and having heat transferring integral fins at opposite sides thereof.

7. A fan having a hub and blades extending generally radially therefrom and which blades are formed to provide air-propelling surfaces, heating means imbedded within and in heat-conducting relationship to said blades beneath said surfaces, and fins arranged transversely of said blades and arranged to transmit heat from the blades to the air propelled by said surfaces.

8. A fan having a hub and blades extending generally radially therefrom and which blades are formed to provide air-propelling surfaces, heating means imbedded within and in heat-conducting relationship to said blades beneath said surfaces, and fins arranged transversely of said blades and arranged to transmit heat from the blades to the air propelled by said surfaces, said fins being on arcs of circles having their common center at the axis of rotation of said hub.

9. A fan having a hub and blades extending generally radially therefrom and which blades are formed to provide air-propelling surfaces, heating means in heat-conducting relationship to said blades beneath said surfaces, and fins arranged transversely of said blades and arranged to transmit heat from the blades to the air propelled by said surfaces.

10. A fan having a hub and blades extending generally radially therefrom and which blades are formed to provide air-propelling surfaces, heating means in heat-conducting relationship to said blades beneath said surfaces, and fins arranged transversely of said blades and arranged to transmit heat from the blades to the air propelled by said surfaces, said fins being on arcs of circles having their common center at the axis of rotation of said hub.

IRVING H. COHEN.