

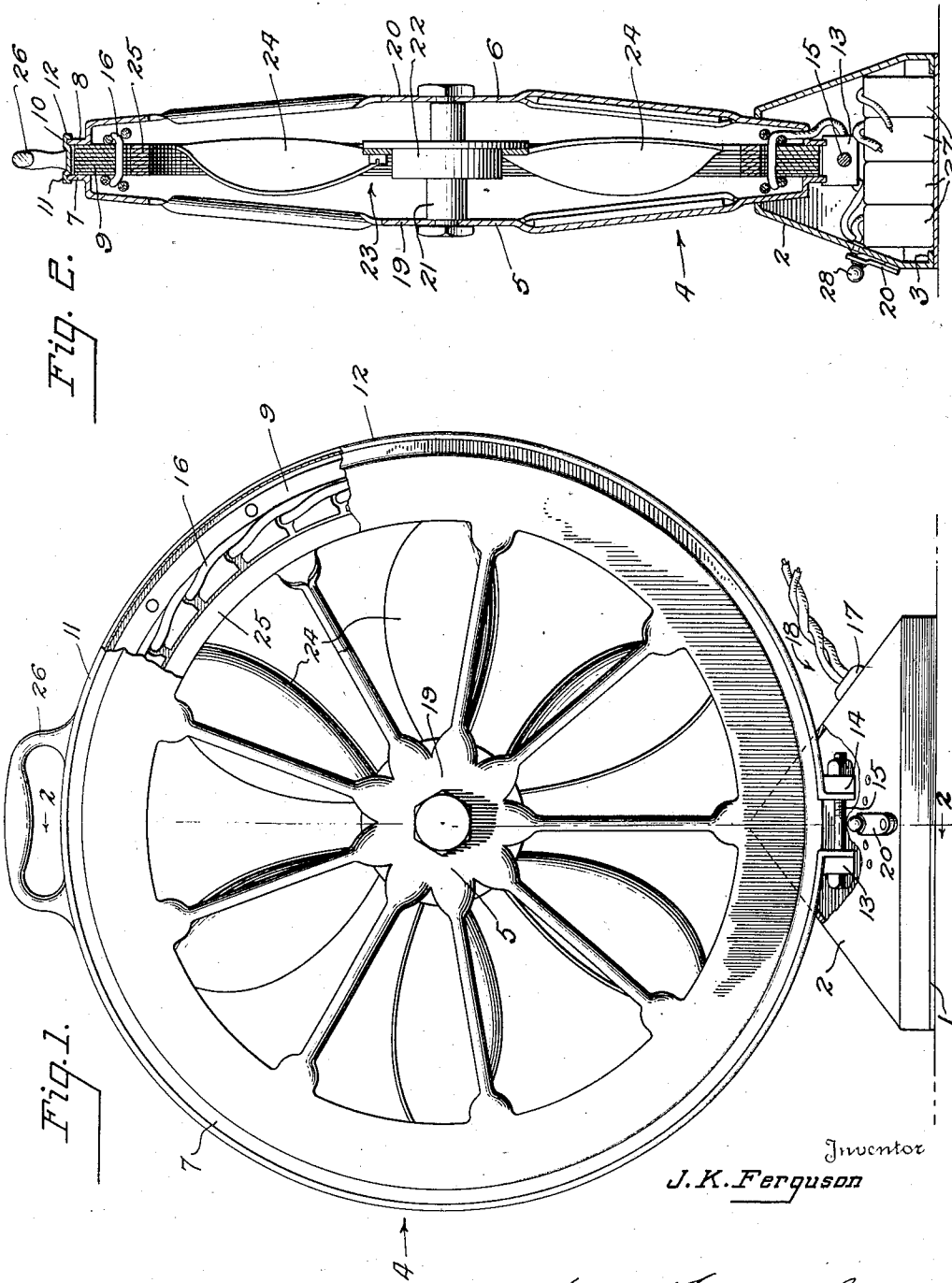
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ELECTRIC FAN

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ELECTRIC FAN

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4 Claims. (Cl. 230—273)

This invention relates in general to ventilating fans, and more particularly to portable fans of the radial blade type adapted for use in households.

As well known in this art, ventilating fans in common use are of the type including a base on which a standard rises to support a horizontal shaft about which the fan blade structure is mounted to rotate. These fans are ordinarily rotated by a rather bulky motor placed to one side of the center of the fan assembly; and supported by the standard. Fans of this character are usually ill balanced, and awkward to move from one location to another. Further, the comparatively large motor unnecessarily increases the dead air space at the center of the fan, and thereby decreases the efficiency of the fan for ventilating purposes.

It is the main object of the present invention to overcome the defects of the fans heretofore in common use, by eliminating the clumsy motor at the center of the fan structure, and by substituting therefor an annular field winding concentric with the fan; the blades of which are provided with an armature cooperating with this winding to effect rotation of the fan when the winding is energized.

Another object of the invention is to provide a fan of the type described which can be manufactured very cheaply as by stamping out the several elements thereof of sheet metal.

A further object of the invention is to provide a fan of this type with a guard frame having its parts symmetrically arranged on opposite sides of the fan blade structure.

Other objects of the invention will become apparent as the detailed description thereof proceeds.

In the drawing:

Figure 1 is a front elevation of the fan constructed according to the present invention, parts thereof being broken away to illustrate details of construction; and

Figure 2 is a central vertical section taken on the line 2—2 of Fig. 1.

As shown in the drawing, the invention comprises a base plate 1, detachably secured to a casing 2, preferably of pyramidal shape. The casing 2 with plate 1 forms the base of the instrument and is provided at its lower end with inturned flanges 3 to seat on the base plate 1, and at its upper end is cut away to form a seat adapted to receive the lower end of a skeleton guard frame designated generally by the reference numeral 4.

The frame 4 comprises two spiders 5 and 6,

each stamped out of sheet metal, and similar to each other in every respect. The spiders 5 and 6 are annular and have their outer edges shaped to form parallel circular flanges 7 and 8, respectively, which are adapted to be clamped against opposite sides of an annular laminated filed plate 9. To hold the flanges 7 and 8 against the opposite sides of the field plate 9, a circular band 10 of springy material is mounted to engage the outer edges of the flanges 7 and 8. The band 10 is provided with grooves 11 and 12 forming seats for the flanges 7 and 8, and spaced apart from each other sufficiently to position the flanges 7 and 8 in tight-clamping fit against the opposite sides of the plate 9.

The band 10 is split and is provided at its opposite ends with lugs 13 and 14. These lugs are suitably bored to receive the shank 15 of a bolt adapted to be operated to draw the ends of the band 10 toward each other and thereby clamp the flanges 7 and 8 of the spiders 5 and 6 securely against the opposite sides of the plate 9.

The plate 9 is slotted across its inner periphery to receive the coils 16 of electric wiring having its ends connected to the socket 17 of a fitting 18 commonly used to connect devices of this character detachably to a source of electrical energy. The spiders 5 and 6 at their centers are shaped to provide solid supporting walls 19 and 20 for the shaft 21 on which the hub 22 of the fan 23 is suitably mounted to rotate.

The outer ends of the blades 24 of the fan 23 are rigidly connected to the annular armature 25 which has its outer periphery concentric with and slightly spaced from the inner periphery of the field plate 9. It will be evident from the disclosure so far that the fan 23 with armature 25 constitutes the rotor of an induction motor having its field secured between plates which form a guard for the fan 23. The band 10 may be provided with a handle 26 adapted to facilitate the movement of the fan as a whole from one location to another.

The fan is intended to be rotated at various speeds. For this purpose, the windings of the motor are connected at their lower ends to condensers 27 which may be connected by means of a pivoted switch 28 to the motor winding to vary the speed thereof. The invention is not concerned with any particular type of switch, or any particular type of winding. It is primarily concerned with the mounting of the fan blade structure so that both sides of the fan blade assembly present substantially the same appearance, and so that the assembly is properly balanced, with

the parts thereof symmetrical with respect to a plane perpendicular to the axes of rotation of the fan, to facilitate carrying the same from one location to another.

5 The peculiar construction of the spiders 5 and 6 and their connection by the band 10 to the plate 9 which forms the field of the motor, form a very rigid assembly adapted to receive many kinds of attachments. The circular field plate 9 serves as
10 a rigid foundation plate or standard for supporting the fan assembly on the base.

It is thought that the invention and its attendant advantages will be understood from the foregoing description, and it is obvious that
15 changes may be made in the form, construction and arrangement of the several parts without departing from the spirit or scope of my invention, or sacrificing any of its attendant advantages; the form herein described being a preferred embodiment for the purpose of illustrating my invention;
20

What I claim is:

1. In an electric fan, a base, two similar dished annular spider plates fixed in spaced apart relationship to said base, a band extending around and fixed to the outer peripheries of said plates to form an annular channel, a shaft fixed to the centers of said plates, a hub rotatable on said shaft between said plates, fan blades extending
25 radially from said hub, a ring armature secured to the outer ends of said blades, an annular field winding for said armature secured in said channel and extending without break around said armature, and means in said base to control energization of said field.
30

2. In an electric fan, a base, two similar spider

plates dished toward their centers and provided with flanges at their peripheries, a flexible band extending around the peripheries of said plates and having parallel grooves receiving said
5 flanges to form an annular channel, means at the ends of said band for clamping the band to said plates, a shaft fixed to the centers of said plates, a hub rotatable on said shaft, fan blades extending radially from said hub, a ring armature secured to the outer ends of said blades, an
10 annular field winding fixed in said channel and extending without break around said armature, and means in said base to control energization of said field, said spiders being fixed to said base with the clamping means concealed therein. 15

3. In an electric fan, a base, two similar spider plates spaced apart and mounted on said base to form a skeleton guard frame, a band extending around and fixed to the outer peripheries of said plates to form an annular channel, a shaft
20 fixed to the center of said plates, a hub rotatable on said shaft between said plates, fan blades extending radially from said hub, cooperating electrical means on the ends of said fan blades and in said channel to cause rotation of said
25 blades, and a switch controlling the operation of said means.

4. In an electric fan, a base, a skeleton guard frame mounted on said base, a fan mounted for rotation within said frame, cooperating means
30 in said frame and on said fan for rotating said fan, and means for controlling the operation of said fan rotating means, the parts of said frame being symmetrical with respect to a plane perpendicular to the axis of rotation of said fan. 35

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