July 30, 1957 J. FOGEL 2,800,967

FAN ROTOR

Filed May 9, 1955

FIG. 1

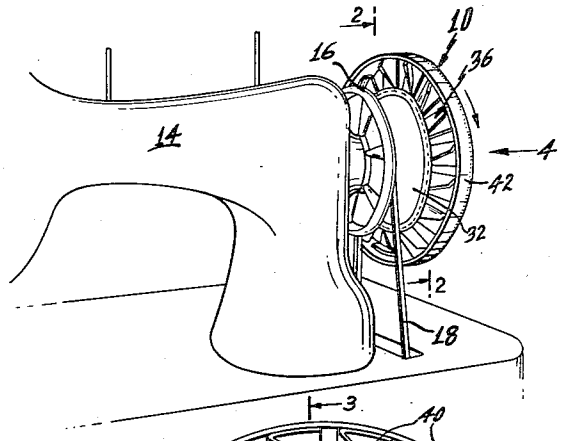


FIG. 2

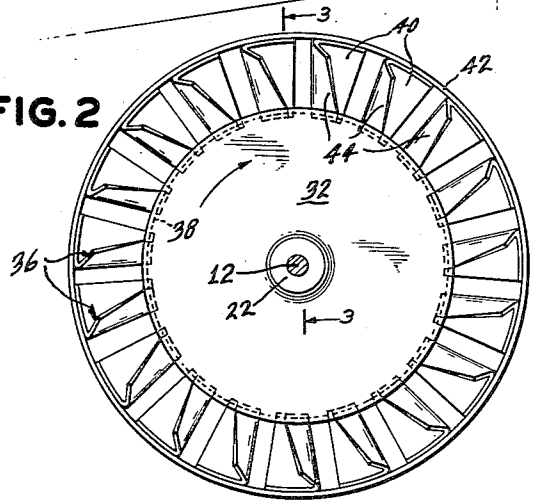


FIG. 4

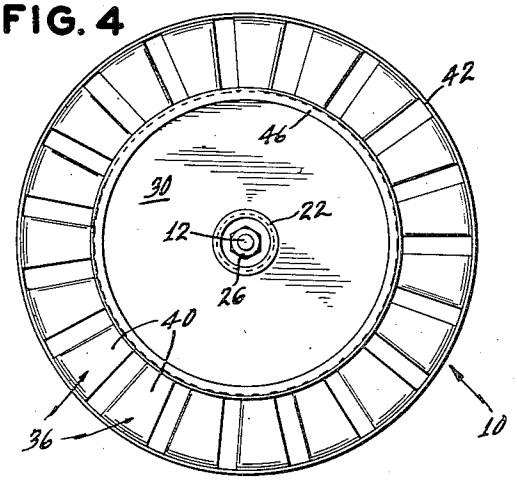
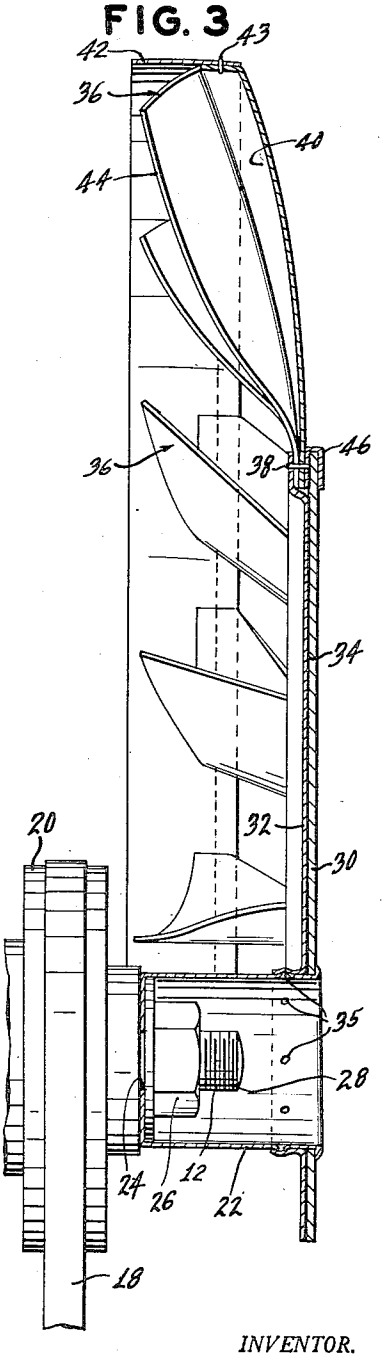


FIG. 3



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3 Claims. (Cl. 170—168)

This invention relates to fans and particularly to fans adapted to be attached to manually controlled machines such as sewing machines.

One object of the present invention is to provide a fan of novel construction for securement to sewing machines.

Another object of the present invention is to provide a fan having flexible outer portions to prevent injury to the operator of the machine.

Another object of the present invention is to provide a fan of such construction that it prevents air from moving radially off said fan and directs the air at an angle to the plane of the fan.

Still another object of this invention is to provide a generally improved fan for attachment to manually controlled machines, the fan being provided with a number of safety features for preventing injury to the operator while still serving the desirable purpose of directing a cool stream of air on the operator.

The above and other objects of the present invention will become more clear hereinafter as the characteristic features of construction and mode of operation of this invention are described in detail.

In the drawings:

Fig. 1 is a perspective view of a manually controlled sewing machine having a fan attached thereto, the fan embodying this invention;

Fig. 2 is a sectional view taken along the line 2—2 of Fig. 1;

Fig. 3 is a sectional view taken along the line 3—3 of Fig. 2; and

Fig. 4 is an end view of the fan looking in the direction of the arrow 4 in Fig. 1.

Referring now to the drawings in detail, the fan 10 is shown in Fig. 1 on a sewing machine 14. The sewing machine is of the manually controlled type and is provided with a fly wheel 16 mounted on shaft 12 for rotation therewith. Rotation of shaft 12 is imparted by means of a treadle or motor arrangement (not shown) which actuates a belt 18 mounted on a pulley 20 which is secured to shaft 12. As will be described in more detail hereinafter, the fan 10 is of such construction that when shaft 12 is rotated, a stream of air will be directed off the fan at an angle to the plane of the fan and directed toward the normal location of the operator of machine 14 thereby making the operator's working conditions more comfortable.

Fan 10 is mounted on shaft 12 by means of a laterally projecting hub 22 which is provided with an aperture 24 through which shaft 12 extends. The hub 24 and shaft 12 are secured for simultaneous rotation by means of a nut 26 which frictionally engages hub 22 and is threadedly mounted on a threaded portion 28 of shaft 12. Hub 22 is secured to a rigid central portion 30 of fan 10 by any suitable means such as by a pressed fit. Preferably, the rigid central portion 30 and hub 22 are made of lightweight material such as aluminum since it is highly desirable to keep the weight of fan 10 to a minimum. Overlying rigid central part 30 is a flexible central part 32 which is substantially co-extensive with rigid central part 30 and is secured thereto in any suitable manner such as by an adhesive bond 34. Flexible disk 32 may be secured to hub 30 by means of struck up portions 35 on the hub 30. Flexible part 32 and other flexible parts hereinafter described may be made of any suitable flexible material such as leather, rubber, or a flexible plastic, this invention not being limited to any particular flexible material.

Secured to the flexible central part 32 in a manner to be described hereinafter are a plurality of blades 36 which will now be described in detail. Blades 36 are made of a flexible material and are formed into a V-shape by doubling them over at their point of securement to flexible central part 32. Blades 36 in their doubled up condition may be secured to their flexible part 32 in any suitable manner, as shown herein the manner of securement is by a sewn seam 38. Since the material is flexible and originally lies in one plane, in the doubled up condition as shown herein the two portions of the blades dispose themselves at angles to one another rather than both lying in substantially the same plane. As best shown in Fig. 2, it may be seen that in their doubled over condition, the two portions of the V-shaped blades are not of the same width but the portions 40 of the blades lying substantially in the plane of the central part of the fan are somewhat wider than the portions 44 extending outwardly from said plane. Secured to the portions 40 of blades 36 is a flexible rim 42 which may be secured to said portions 40 in any suitable manner such as by sewn seam 43. Rim 42 extends axially from portions 40 so that it overlies the portions 44 of blades 36 which extend outwardly from the main plane of the fan. With the parts so disposed, it will be seen that a plurality of flexible pockets are defined for scooping air and the only escape provided for in these pockets is in the direction in which the portions 44 of blades 36 extend, that is off at an angle to the plane of the fan. With rim 42 disposed above the pockets as heretofore described, it will be obvious that air is prevented from moving out of the pockets radially of the fan in which direction the air would not be directed toward the operator of the machine but would just generally agitate the air in the room. As already stated, the flexible rim obviates this possibility and assures that the air streaming off the fan will be directed toward the operator.

The fan heretofore described has a number of decided advantages over fans heretofore known. Since both rim 42 and blades 36 are flexible, the possibility of the operator of the machine being injured by the fan is substantially obviated since the flexible material will yield if a person enmeshes his hand or fingers therewith. Furthermore, by providing a hub which extends laterally of the plane of the fan, a simple means is provided for spacing the fan from the flywheel 16 thereby reducing the possibility of the operator catching his hand in the fan when handling the flywheel. The central rigid portion of the fan is preferably of a diameter somewhat smaller than the diameter of flywheel 16 to insure that the operator handling flywheel 16 cannot engage the central rigid portion. However, this last feature of applicant's invention is not necessary since if a person engages the flexible parts of fan 10 his hand will be cushioned against direct engagement with the rigid parts thereof by the deformed flexible parts. Furthermore, if desired, a rim 46 of a soft flexible material may be secured to flexible central part 32 by seam 38 and be bent over the peripheral edge of the rigid central part in order to prevent any possible mutilation of an opera-

tor's hand in the event that he engages the peripheral edge of rigid part **30**.

Although I have shown and described one form of the present invention and have suggested various changes and modifications therein, various other changes and modifications may be made therein within the scope of the appended claims without departing from the spirit and scope of this invention.

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

1. A fan comprising a rigid central part adapted to be connected to a rotary shaft, a flexible central part of substantially the same peripheral extent as said rigid central part and secured to said rigid central part, a plurality of rectangular flexible members secured to said flexible central part in doubled over relationship and extending radially outwardly therefrom whereby to form V-shaped fan blades with one leg of the V substantially in the plane of said central parts, and a flexible rim secured to said legs of said fan blades which are in the plane of said central parts, said flexible rim extending from said one leg and overlying the other legs of said blades to form flexible pockets having a sole fluid escape in the direction in which said other legs extend whereby to direct fluid off said fan in other than a radial direction.

2. A fan comprising a rigid central part adapted to be connected to a rotary shaft, a flexible central part of substantially the same peripheral extent as said rigid central part and secured to said rigid central part, a plurality of rectangular flexible members secured to said flexible central part in doubled over relationship and extending radially outwardly therefrom whereby to form V-shaped fan blades with one leg of the V substantially in the plane of said central parts, and a flexible rim secured to said legs of said fan blades which are in the plane of said central parts, said flexible rim extending from said one leg and overlying the other legs of said blades to form flexible pockets having a sole fluid escape in the direction in which said other legs extend whereby to direct fluid off said fan in other than a radial direction and a U-shaped flexible molding connected to said flexible central part and overlying the peripheral edge of said rigid central part whereby to prevent inadvertent contact with said peripheral edge of said rigid central part.

3. A fan comprising a central part adapted to be connected to a rotary shaft, a plurality of radially extending flexible members formed of foldable material and secured to said central part in doubled over relationship and extending radially outwardly therefrom in said relationship whereby to form V-shaped fan blades with one leg of the V substantially in the plane of said central part, and a flexible rim secured to the outer ends of said legs of said fan blades which are substantially in the plane of said central parts, the other legs of said blades terminating in free ends, said flexible rim overlying said free ends of said other legs of said blades whereby to form flexible pockets for directing the fluid off said fan in other than a radial direction.

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