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FAN ATTACHMENT FOR MACHINES

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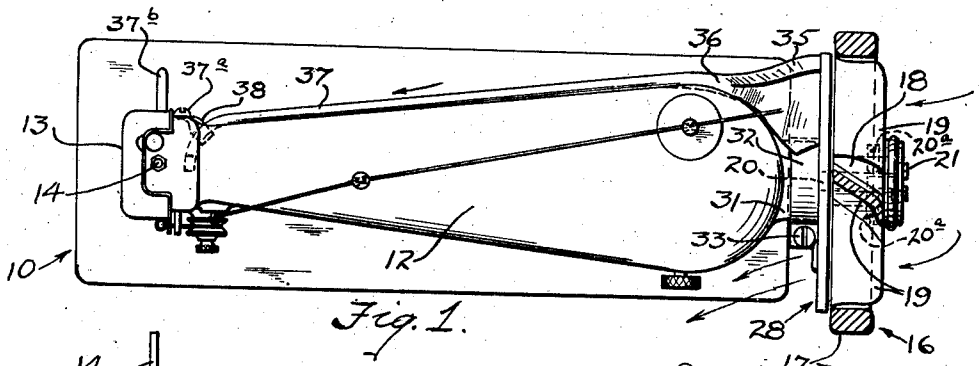


Fig. 1.

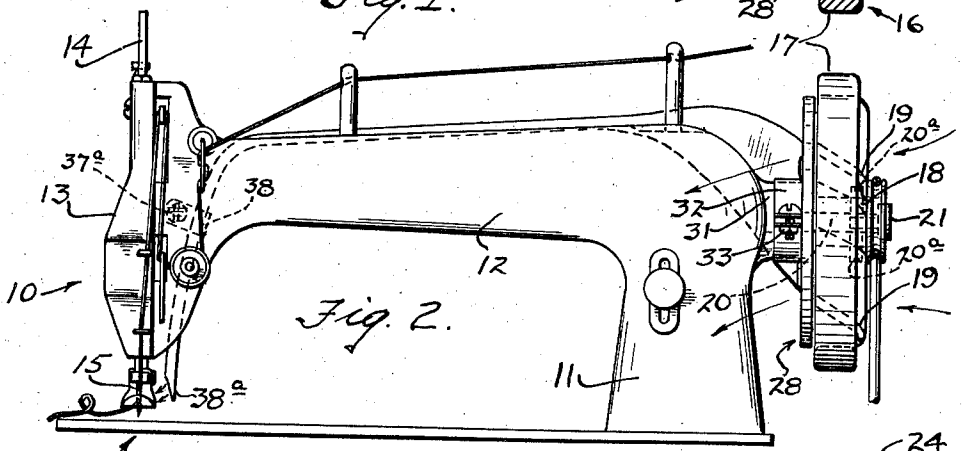


Fig. 2.

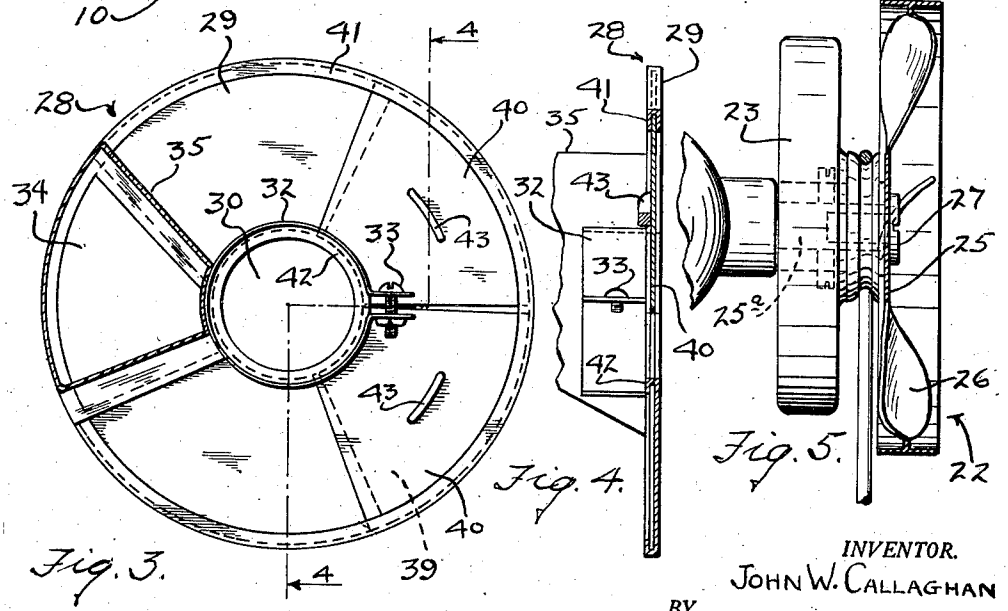


Fig. 3.

Fig. 4.

Fig. 5.

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FAN ATTACHMENT FOR MACHINES

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14 Claims. (Cl. 230—247)

This invention relates to machines for performing certain operations upon articles, such as sewing machines, cutting machines, and the like, and is particularly applicable to sewing machines.

One of the objects of the invention is to provide an attachment for a machine whereby the movement of the machine will cause a current of air to be directed towards the operator of the machine.

Another object of the invention is to provide an air blowing attachment for a machine which will cause a current of air to be directed towards the operator while the machine is operating and also cause a stream of air to be directed across the working area of the machine.

Another object of the invention is to provide an attachment for a machine which will direct a current of air towards the operator of the machine and which is provided with means for adjusting the amount of air delivered to the operator.

Still another object of the invention is to provide an air circulating device for machines which may be readily applied to the machine without altering the structure thereof.

Still another object of the invention is to provide an air circulating attachment for machines which may be easily attached to the machine without materially changing the parts thereof, and by means of which a stream of air may be directed across the working area and at the same time a current of air may be directed against the operator.

Still another object of the invention is to provide an attachment for a sewing machine by means of which a current of air may be directed towards the operator when the machine is in motion.

Another object of the invention is to provide a device which may be easily applied to a sewing machine for producing a continuous stream of air across the working area thereof.

Other objects of the invention and objects relating to the method of manufacturing and assembling the various parts will be apparent as the description of the invention proceeds.

The invention has been illustrated in the accompanying drawing, in which:

Fig. 1 is a plan view of a sewing machine with one embodiment of my invention attached thereto;

Fig. 2 is a side elevational view of the machine of Fig. 1;

Fig. 3 is an end view, partly in section, of the air controlling member of the device of Figs. 1 and 2;

Fig. 4 is a sectional side elevational view of the air controlling member of Fig. 3, taken on the line 4—4 of that figure; and

Fig. 5 is a side elevational view, partly in section, of a portion of a machine with a modified form of the invention applied thereto.

Referring now more specifically to Figs. 1 and 2 of the drawing, the invention has been shown applied to a sewing machine 10 of conventional design, having a main supporting upright 11, a horizontally extending arm 12, and a head 13 at the end of the arm for supporting the vertically reciprocating spindle 14 carrying the needle 15 at the lower end thereof.

In the conventional sewing machine a driving shaft protrudes from the end of the machine adjacent the main supporting upright and carries a fly-wheel and pulley for the driving belt. In the form of the invention illustrated in Figs. 1 and 2, this fly-wheel is replaced by a combined fly-wheel and fan 16 having a rim 17, a hub 18, and a plurality of curved air deflecting blades or vanes 19 mounted between the hub and the rim and attached to both in any desired manner, as by being cast integral therewith. The wheel may be held upon the shaft 20 by means of two set screws 20^a and the large headed screw 21. The fan wheel 16 is shown partly in section in Fig. 1 to illustrate a preferred shape of the air deflecting vanes. However, any suitable shape or arrangement of fan blades may be used, if desired, as long as they force a current of air through the wheel as it rotates.

The blades are arranged at such an angle that when the machine is in operation, with the operator sitting in front of the machine and to the left of the wheel, the air is drawn through the wheel and towards the operator, thus keeping the air in circulation and greatly increasing the comfort of the operator.

The combined fly-wheel and fan just described has additional advantages to be explained later, but the result desired above may also be produced by an entirely separate fan 22, shown in Fig. 5 directly attached as an auxiliary member to the regular fly-wheel 23. This fan may be made of sheet metal, plastic material, heavy fabric, rubber, or other suitable material, if desired, and may comprise a flat cylindrical rim 24 and a flat central disc 25, while a plurality of air deflecting vanes or blades 26 may be mounted between the disc and the rim. The central disc 25 may have a hole in the center thereof so that the fan may

be slipped over the end of the shaft 25ª when the end screw 27 is removed, and secured in place upon the shaft in addition to the fly-wheel already there by replacing the screw. The vanes of the wheel may be so shaped that air is forced through the wheel in the direction of the operator, as in the case of the modification already described. The flat rim may act as a guard to prevent damage to the operator's fingers or hands in case they come in contact with the wheel. If desired, an additional guard may be provided to surround the fan.

Not only does the air move in the direction of the operator, but it blows across the working surface of the machine as well. However, in many instances it may be desirable to produce a more powerful stream of air across the area in which the needle is operating, so as to maintain the needle cool and prevent the thread from scorching, especially where the work is heavy and the speed of the machine is high. In order to accomplish this purpose I prefer to use the combined fly-wheel and fan 16 of Fig. 1 and in addition an air controlling member 28, comprising a disc 29 (Fig. 3) provided with a central opening 30 large enough to fit over the bearing 31 at the right hand end of the machine. The controlling member may be held in place on the bearing by means of a clamp band 32 which may be secured to the disc in any desired manner, as by welding, at several places adjacent the central hole, and which may be provided with a clamping bolt 33 by means of which the band may be secured tightly around the bearing and the disc rigidly held in position close against the inner side of the combined fly-wheel and fan, but without touching it.

The member 28 may be provided with a triangular opening 34 on the opposite side of the central opening from the operator. This opening may communicate with a tubular member 35, preferably provided with an enlarged opening adapted to conform to the shape of the opening 34 and the edges of which may be welded, or otherwise attached, to the disc 29, so that it is integral with the disc and the disc forms a rigid support for the tubular member.

The tubular member 35 may be so proportioned that it will occupy the space between the upright 11 of the machine and the wheel 16 and conform to the rear and side contour of the upright. It may also taper considerably away from the disc until it reaches a point 36 where it may join a small tube 37 of any suitable material which may pass along the horizontal arm 12 to which it may be attached, if desired, by means of a small clip 38 held against the arm by a suitable screw, such as the presser foot screw 37ª adjacent the presser foot lever 37ᵇ. The tube 37 may be bent downwardly and inwardly to terminate at a point 38ª adjacent the point of the needle. The end of the tube may be preferably cut at such an angle that the air coming out of the tube will be directed across the working surface of the machine.

Inasmuch as the air controlling member 29 is closely positioned in back of the fan wheel 16, the disc will prevent air from passing through the wheel unless a suitable opening is provided to let the air pass through. Such a suitable opening is the opening 34 which leads into the tubular member 35, and hence air is forced into the tubular member 35 and out the lower end of the tube 37. Attention is drawn to the fact that the current of air is continuous as long as the machine is operating and not intermitent as is the case when an air pump is operated by the reciprocating needle holding member.

The air controlling member 28 may be provided with another opening 39 which may be located on the opposite side from the tubular member 35 so that it comes in front of the machine. Air, forced by the fan wheel 16 through this opening, blows in the direction of the operator, thus making the operation of the machine more comfortable for him in hot weather. The amount of air flowing through this opening may be adjusted by providing a plurality of shutters 40 which may be mounted to rotate around the center of the disc to open and close the opening 39.

One way in which the shutters may be conveniently arranged for such rotation is to provide the disc 29 with an inwardly turned narrow flange 41, attached to the disc at the outer circumference and with the inner edge spaced sufficiently from the disc to permit the outer edges of the shutters to slide easily between the disc and the flange. In like manner I may provide the edge of the central opening 30 with an outwardly turned flange 42, the outer edge of which may be spaced from the disc sufficiently to slidably receive the inner edges of the two shutter members 40. Suitable finger grips 43 may be provided on the surface of the shutter members away from the fan wheel to permit the operator to move the shutter members with his fingers to adjust them to give the desired amount of air. Friction between the shutter members and the disc and flanges will hold the former in any desired position.

From the above description it will be evident that I have provided a fan attachment for a machine, such as a sewing machine, by means of which a current of air may be directed towards the operator and across the work area of the machine while the machine is in motion. A more elaborate form of the invention provides an additional controlling device by means of which a more powerful stream of air may be directed across the working area while the machine is operating, to blow ravellings and other undesirable matter away from the work surface and to cool the needle, thus preventing the temperature thereof from rising to such a point at which it might tend to scorch the thread and at which the temper thereof might be destroyed.

The device has been illustrated with a sewing machine and is particularly adapted for use with a sewing machine, the attachment being designed to substantially fit any model or make of machine. However, the invention is also adapted for use with other machines, such as cutting machines, button-hole machines, or any other machines using needles or other reciprocating tools, and may be as easily attached as long as the machine has a fly-wheel to which the fan of Fig. 5 may be secured or which may be replaced by the combined fan and fly-wheel and the additional controlling device of Figs. 1 and 2.

Modifications of the invention may be made without departing from the spirit thereof, and I do not desire to limit myself to what has been shown and described except by the limitations included in the appended claims.

What I claim is:

1. In a machine for performing an operation upon an article, a rotatable shaft for driving said machine, a fly-wheel mounted upon said shaft for rotation therewith, means attached to said

fly-wheel to cause a current of air to pass through said fly-wheel when said fly-wheel is rotated, and adjustable means to control the amount of air passing therethrough.

2. In a machine for performing an operation upon an article, a rotatable shaft for driving said machine, a fly-wheel mounted upon said shaft for rotation therewith, means on said fly-wheel for causing a current of air to pass through said fly-wheel when said fly-wheel is rotated, and means to direct a portion of the air passing through said fly-wheel across the working area of said machine.

3. In a machine for performing an operation upon an article, a rotatable shaft for driving said machine, a fly-wheel mounted upon said shaft for rotation therewith, means cooperating with said fly-wheel for causing a current of air to pass through said fly-wheel when said fly-wheel is rotated, means to direct a portion of the air passing through said fly-wheel across the working area of said machine, and means to direct another portion of the air passing through said fly-wheel towards the operator of said machine.

4. In a machine for performing an operation upon an article, a rotatable shaft for driving said machine, a fly-wheel mounted upon said shaft for rotation therewith, means cooperating with said fly-wheel for causing a current of air to pass through said fly-wheel when said fly-wheel is rotated, means to direct a portion of the air passing through said fly-wheel across the working area of said machine, means to direct another portion of the air passing through said fly-wheel towards the operator of said machine, and means for controlling the amount of air directed towards said operator.

5. In a machine for performing an operation upon an article, a rotatable shaft for driving said machine, a fly-wheel mounted upon said shaft for rotation therewith, a disc positioned in close proximity to one side of said fly-wheel but out of contact therewith, said disc having sufficient diameter to substantially prevent the passage of air around the edge of said flywheel, means to mount said disc rigidly upon a stationary portion of said machine, said disc having an opening therein, and means on said fly-wheel for causing a current of air to pass through said opening when said fly-wheel is rotated.

6. In a machine for performing an operation upon an article, a rotatable shaft associated with the driving mechanism of said machine, a fly-wheel mounted upon said shaft for rotation therewith, means to cause a current of air to pass through said fly-wheel when said fly-wheel is rotated, a disc positioned in close proximity to said fly-wheel but out of contact therewith, said disc having sufficient diameter to substantially prevent the passage of air around the edge of said flywheel, said disc having an opening through which the air passing through said fly-wheel must pass, and means to control the size of said opening.

7. In a machine for performing an operation upon an article, a rotatable shaft associated with the driving mechanism of said machine, a fly-wheel mounted upon said shaft for rotation therewith, a disc positioned in close proximity to one side of said fly-wheel but out of contact therewith, said disc having sufficient diameter to substantially prevent the passage of air around the edge of said flywheel, means to mount said disc rigidly upon a stationary portion of said machine, said disc having an opening therein, means on said fly-wheel for causing a current of air to pass through said opening when said fly-wheel is rotated, and means to direct the air passing through said opening across the working area of said machine.

8. In a machine for performing an operation upon an article, a rotatable shaft associated with the driving mechanism of said machine, a fly-wheel mounted upon said shaft for rotation therewith, a disc positioned in close proximity to one side of said fly-wheel but out of contact therewith, means to mount said disc rigidly upon a stationary portion of said machine, said disc having an opening therein, means on said fly-wheel for causing a current of air to pass through said opening when said fly-wheel is rotated, said disc having a second opening therein through which a portion of the air passing through said fly-wheel passes, and means to direct the air passing through one of said openings across the working area of said machine.

9. In a machine for performing an operation upon an article, a rotatable shaft associated with the driving mechanism of said machine, a fly-wheel mounted upon said shaft for rotation therewith, means to cause a current of air to pass through said fly-wheel when said fly-wheel is rotated, a disc positioned in close proximity to said fly-wheel but out of contact therewith, said disc having an opening through which the air passing through said fly-wheel must pass, means to control the size of said opening, said disc having a second opening therein through which a portion of the air passing through said fly-wheel passes, and means to direct the air passing through one of said openings across the working area of said machine.

10. In a machine for performing an operation upon an article, a rotatable shaft for driving said machine, a fly-wheel mounted upon said shaft for rotation therewith, a disc positioned in close proximity to one side of said fly-wheel but out of contact therewith, means to mount said disc rigidly upon a stationary portion of said machine, said disc having an opening therein, means on said fly-wheel for causing a current of air to pass through said opening when said fly-wheel is rotated, and a tubular member having one end against said disc and surrounding said opening and the other adjacent the working area of said machine.

11. In a machine for performing an operation upon an article, a rotatable shaft associated with the driving mechanism of said machine, a fly-wheel mounted upon said shaft for rotation therewith, means to cause a current of air to pass through said fly-wheel when said fly-wheel is rotated, a disc positioned in close proximity to said fly-wheel but out of contact therewith, said disc having sufficient diameter to substantially prevent the passage of air around the edge of said flywheel, said disc having an opening through which the air passing through said fly-wheel must pass, and means to control the size of said opening, said means comprising a shutter slidably mounted on said disc to adjustably cover said opening.

12. In a machine for performing an operation upon an article, a rotatable shaft associated with the driving mechanism of said machine, a fly-wheel mounted upon said shaft for rotation therewith, means to cause a current of air to pass through said fly-wheel when said fly-wheel is rotated, a disc positioned in close proximity to

said fly-wheel but out of contact therewith, said disc having an opening through which the air passing through said fly-wheel must pass, means to control the size of said opening, said means comprising a shutter slidably mounted on said disc to adjustably cover said opening, said disc having a second opening therein through which a portion of the air passing through said fly-wheel passes, and means to direct the air passing through one of said openings across the working area of said machine.

13. An attachment for a sewing machine comprising a replacement fly-wheel containing air vanes for causing air to pass through said fly-wheel when said fly-wheel is rotated and adapted to be attached to the sewing machine in place of the fly-wheel supplied therewith, a member adapted to be positioned in close proximity to said fly-wheel but out of contact therewith, said member having an opening therein, means to lead the air passing through both said fly-wheel and said opening to the working surface of said machine, means to mount said member and said means in rigid position upon said machine, said member having a second opening therein, and means to control the amount of air passing through said second opening.

14. An attachment for a sewing machine comprising a replacement fly-wheel containing air vanes for causing air to pass through said fly-wheel when said fly-wheel is rotated and adapted to be attached to the sewing machine in place of the fly-wheel supplied therewith, a member adapted to be positioned in close proximity to said fly-wheel but out of contact therewith said member having an opening therein, means to lead the air passing through both said fly-wheel and said opening to the working surface of said machine, means to mount said member and said means in rigid position upon said machine, said member having a second opening therein, and means to control the amount of air passing through said second opening, said means comprising a shutter adjustably mounted to cover said second opening.

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