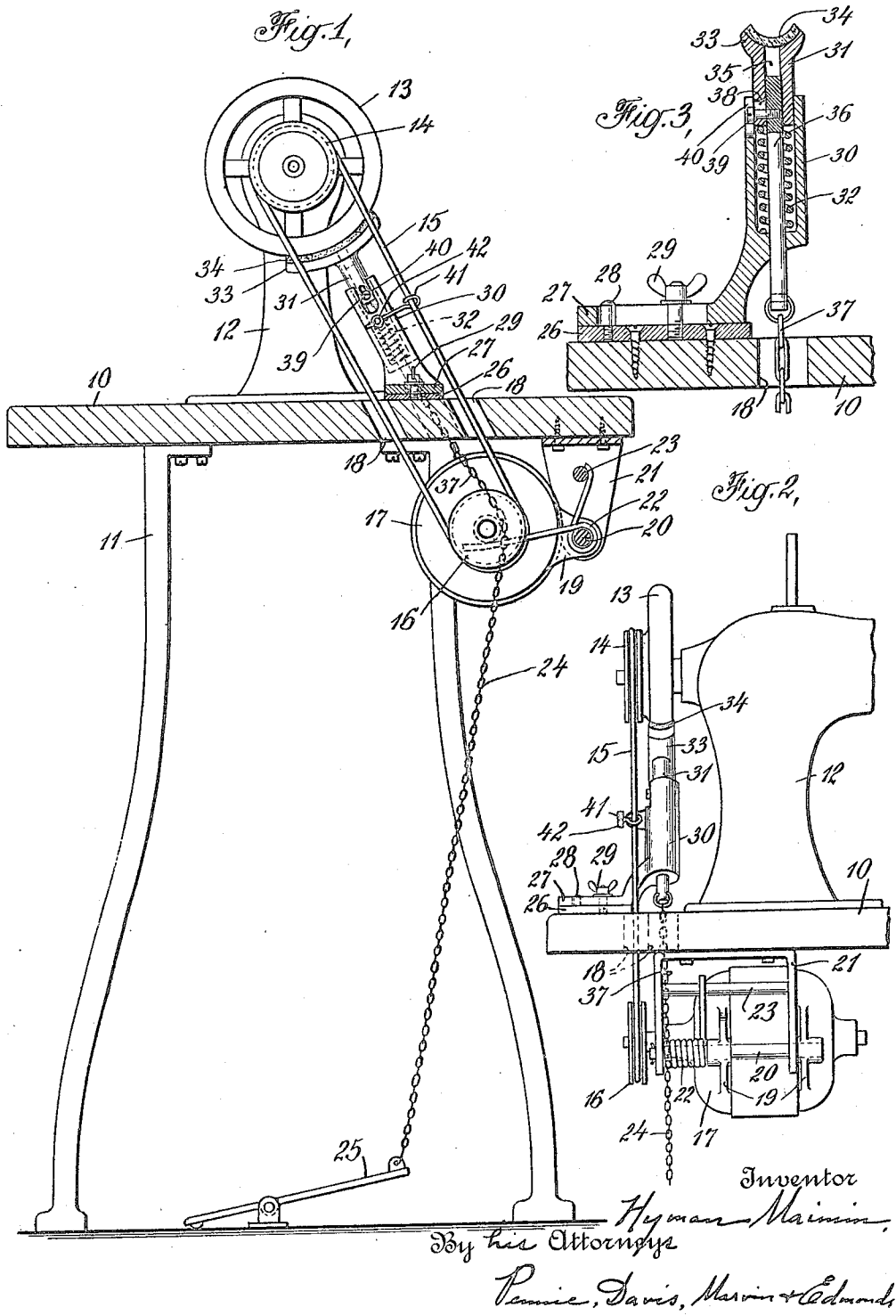


H. MAIMIN.
MOTOR DRIVE FOR SEWING MACHINES.
APPLICATION FILED MAY 1, 1920.

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UNITED STATES PATENT OFFICE.

HYMAN MAIMIN, OF NEW YORK, N. Y.

MOTOR DRIVE FOR SEWING MACHINES.

Application filed May 1, 1920. Serial No. 378,041.

To all whom it may concern:

Be it known that I, HYMAN MAIMIN, a citizen of the United States, residing at New York city, in the county of New York, State of New York, have invented certain new and useful Improvements in Motor Drives for Sewing Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to motor drives for sewing machines and particularly to an arrangement in which the motor is pivotally mounted adjacent the hand wheel or driving pulley of the sewing machine in such a manner that it may be thrown into or withdrawn from operative relation to the machine by swinging it about its pivot whenever it is desired to start or stop the machine. The arrangement thus eliminates the use of a rheostat for controlling the motor, thereby lessening the cost of the equipment as well as avoiding the troubles due to the use of such an instrument.

For most convenient operation the position of the motor should be controlled by a treadle in order that the hands of the operator may be free for manipulating the work, and preferably the connection between the treadle and the motor is arranged to permit a certain amount of lost motion so that when the treadle is depressed the motor will be held in operative relation to the machine by its own weight unaffected by any opposing effect of the spring which is associated with the treadle for lifting the motor out of operative relation to the machine whenever it is desired to stop the latter. The arrangement is therefore such that the speeds at which the machine will be driven under normal conditions shall be of predetermined amounts and will not be as subject to variations in the efforts expended by the operator as are other arrangements, such, for instance, as those in which the pressure with which a pulley on the shaft of the motor is held in engagement with the hand wheel of the machine, or the tension of a driving belt is directly dependent upon the force exerted by the operator. The arrangement does, however, permit the operator to change the speed of the machine from time to time as may be required, but this

alteration necessitates a special act on his part which will not naturally be performed under normal conditions of operation. Moreover, the most comfortable position for the operator is one in which the motor bears with its full weight either against the driving belt or the hand wheel of the machine. Thus, any attempt to run the machine at a reduced speed for any considerable length of time will impose an uncomfortable strain upon the operator.

The use of a spring actuated treadle, such as is shown in my copending application, requires the provision of a special form of treadle which must be mounted in a definite position to bring the operating connection in proper relation to the other parts of the machine. In some cases it may be more convenient, and also lessen the cost of the apparatus, if the treadle which forms part of the regular equipment of a sewing machine can be employed for controlling the position of the motor.

In accordance with this invention the motor is provided with a spring associated with its mounting and adapted to lift the motor out of operative relation to the machine, except when its effect is overcome by depressing the treadle of the machine, which is mechanically connected to the spring by a chain or cord. Preferably the motor should be mounted beneath the table of the machine in order to leave the top of the latter free for holding the work. With such an arrangement the machine will be driven by a belt and the spring will be arranged to lift the motor and slacken the belt to stop the machine.

With any arrangement in which the motor is entirely disconnected from the machine when it is desired to stop the latter, the momentum of the moving parts of the machine will cause it to run after the motor has been disconnected therefrom.

In accordance with this invention there is provided a brake adapted to be mounted on top of the table of the machine and constructed to be held in engagement with the hand wheel of the machine by a spring when the motor is elevated by its spring to slacken the driving belt, but which will be withdrawn from engagement with the hand wheel whenever the effect of the motor spring is overcome by depressing the treadle. The brake is so

mounted upon the table of the machine that it may be moved sidewise out of the plane of the hand wheel to allow the frame of the machine to be tilted backward to permit access to the parts mounted beneath the base of the frame, and which are concealed when the frame is in its normal position upon the table of the machine.

The particular nature of the invention, as well as other objects and advantages of its several features, will appear more clearly from a description of certain preferred embodiments as shown in the accompanying drawings, in which—

Figure 1 is a view of the entire machine taken in transverse section through its table, and the base of the brake mechanism;

Figure 2 is a side elevation of the apparatus of Figure 1; and

Figure 3 is an enlarged, longitudinal sectional view of the brake mechanism.

The sewing machine illustrated somewhat diagrammatically in the drawings comprises a table 10 carried upon standards 11 and serving as a support for the frame 12 which consists of a vertical portion and a horizontal portion carrying at its outer end the usual casing within which the mechanism for reciprocating the needle is mounted, this mechanism being driven by a shaft carrying a hand wheel 13 and a pulley 14 which is connected by means of a belt 15 to a pulley 16 on the shaft of a motor 17 mounted below the table of the machine, which is provided with suitable holes 18 through which the belt may pass. The motor is provided with lugs 19 adapted to receive a pin 20 supported in the depending members 21 of a bracket adapted to be attached to the under side of the table of the machine.

In order to utilize the weight of the motor to its fullest extent in producing tension in the driving belt, the latter should be of such a length that it holds the motor in a position with its shaft and the pivot pin 20 lying in a substantially horizontal plane. For overcoming the effect of the weight of the motor and thereby slackening the driving belt there is provided a spring 22 coiled about the pin 20 with one end retained by a pin 23 extending between the depending portions of the bracket and the other end lying under one of the bearing bushings of the motor. The spring normally tends to lift the motor and slacken the driving belt, and in order to overcome its effect there is attached to the portion extending to the motor a chain 24 leading to a treadle 25 which as shown herein may be the usual treadle of the machine, or it may be a special form of treadle adapted to be placed in convenient position to be reached by the operator.

The brake mechanism of the invention consists of a base 26 adapted to be attached

to the table of the machine between the belt holes 18. Mounted upon the base is a member 27 consisting of a flat portion having a slot through which extends a stud 28 projecting from the base 26 and a set screw 29 by which the brake may be clamped in position. The member 27 is provided with a socket 30 within the top of which is a plunger 31 normally pressed outwardly by a spring 32 and carrying at its free end an enlargement 33 having its inner face corresponding in contour to the outside of the hand wheel and lined with suitable friction material 34 forming a brake shoe. The plunger 31 is provided with a bore 35 within which is fitted one end of a rod 36 passing through the bottom of the socket 30 and connected to the spring 22 by a continuation 37 of the chain 24, this portion of the chain passing through a hole in the table of the machine. The plunger 31 is provided with a slot as at 38, and a set screw 39 having its shank passing through the slot and into the rod 36 provides an adjustable connection between the plunger and the rod. The end of the socket 30 is provided with a slot 40 to receive the head of the screw and thus prevent the plunger 31 and rod 36 from turning in the socket. The brake shoe is thereby held in proper relation to the hand wheel of the machine. A hook 41 adjustably attached to the outside of the socket by means of a set screw 42 serves as a guide for the upwardly moving portion of the belt to prevent the latter from jumping off of the pulley 14.

In the operation of the apparatus described above the spring 22 will normally lift the motor sufficiently to slacken the driving belt so that no power will be transmitted from the motor to the machine. Whenever it is desired to operate the machine the treadle 25 will be depressed and through the chain 24 will overcome the effect of the spring to allow the motor to drop until it tightens the driving belt sufficiently to permit power to be transmitted to the machine. The movement of the motor will depend upon the amount by which the treadle is depressed, so that the belt tension and consequently the speed of the machine will be directly under the control of the operator, and may be altered by him at will.

In some cases it may be desirable to arrange the parts so that when the treadle is depressed to its greatest extent the end of the spring 22 to which the chain 24 is connected will be withdrawn from engagement with the motor so that the belt tension produced by the weight of the motor will not be lessened by any opposing effect of the spring. Such an arrangement is particularly useful in those cases in which it is desired that the machine be normally oper-

ated at a predetermined speed to which the operator is required to conform in the performance of his work.

Whenever the motor is lifted by the spring 22 sufficiently to slacken the driving belt, the spring 32 will force the plunger 31 out of socket 30 until its brake shoe 34 engages the hand wheel of the machine. When the treadle 25 is depressed to overcome the lifting effect of spring 22, the chain 37 will through the rod 36 draw the plunger 31 into its socket and disengage the brake shoe from the hand wheel, so that the machine will be free to start as soon as the weight of the motor begins to produce tension in the driving belt. The parts should be so adjusted that the brake shoe will be withdrawn from the hand wheel before the motor has moved downwardly enough to produce sufficient tension in the driving belt to permit any power to be transmitted to the machine. This will eliminate the danger of running the machine against the friction of the brake shoe with resultant loss of power.

On account of the location of the brake mechanism between the belt and the frame 12 it occupies a position that cannot be utilized for any other useful purpose and does not interfere with work which may be placed upon the table of the machine. Whenever it may be desired to tilt the frame of the machine backward to permit access to the parts mounted on the bottom of the frame, the set screw 29 will be loosened to permit the brake mechanism to be moved sidewise out of the plane of the hand wheel so that it will not interfere with the tilting of the frame of the machine.

While a preferred embodiment of the invention has been shown and described, it will be understood that various changes in the details of construction of the apparatus may be made without departing from the principle of the invention as defined in the appended claims.

Cross reference is hereby made under the provisions of Rule 43, to copending application Serial No. 343,216, filed December 8th, 1919.

I claim:

1. In a sewing machine mounted upon a table and provided with a driving wheel, the combination of a bracket adapted to be attached to the table of the machine, a motor mounted to swing about an axis on the bracket and be held in operative relation to the wheel of the machine by its own weight, a spring associated with the bracket tending to lift the motor out of operative relation to the wheel of the machine, and means for counteracting the lifting effect of the spring to permit the motor to swing into operative relation to the machine.

2. In a sewing machine mounted upon a table and provided with a driving wheel, the combination of a bracket adapted to be attached to the table of the machine, a pin associated with the bracket, a motor mounted upon the pin and adapted to be held in operative relation to the wheel of the machine by its own weight, a spring coiled about the pin and having one end in engagement with the motor for lifting the motor out of operative relation to the wheel of the machine, a treadle, and a connection between the treadle and the said end of the spring for overcoming the lifting effect of the spring to permit the motor to fall into operative relation to the machine.

3. In a sewing machine mounted upon a table and provided with a pulley, the combination of a bracket adapted to be attached to the underside of the table of the machine, a pin associated with the bracket, a motor mounted upon the pin, a belt between the motor and the pulley of the machine and adapted to be maintained in tension by the weight of the motor, a spring coiled about the pin and having one end extending horizontally and engaging the motor to lift the same to slacken the driving belt, and means under the control of an operator and attached to the said end of the spring whereby the lifting effect of the spring may be overcome to permit the motor to tighten the driving belt.

In testimony whereof I affix my signature.
HYMAN MAIMIN.