J. J. WOOD.

MOTOR DRIVE.

APPLICATION FILED JULY 15, 1915.

1,232,152.

Patented July 3, 1917.

Fig. 1.

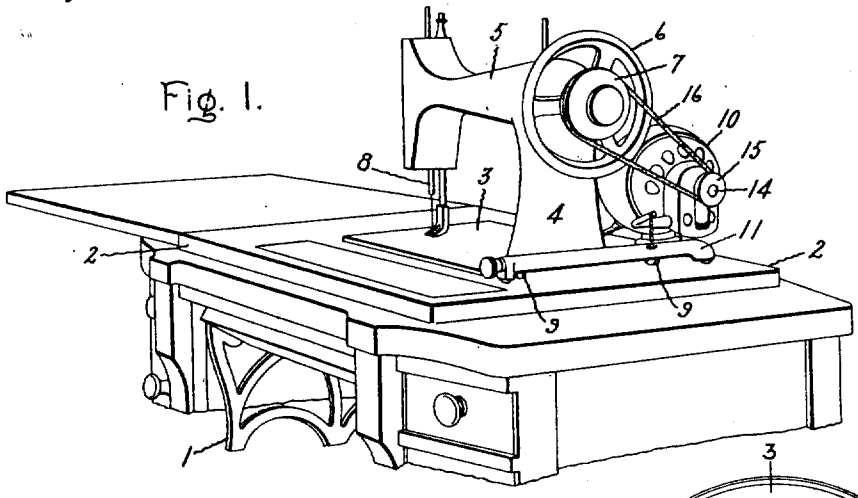



Fig. 2.

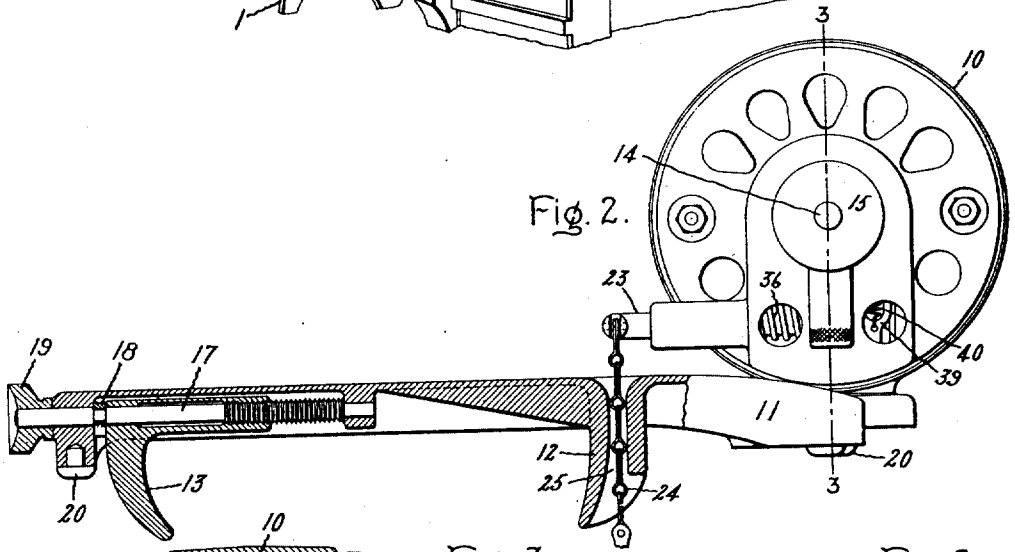



Fig. 3.

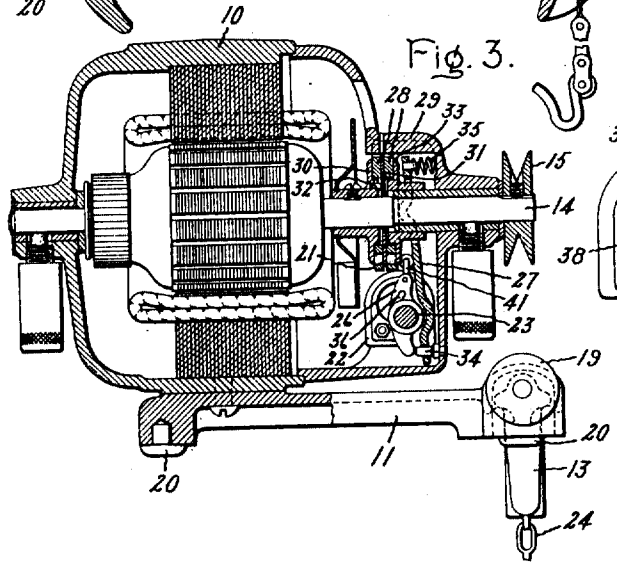



Fig. 4.

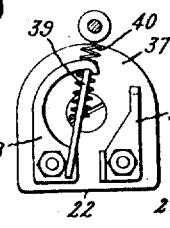
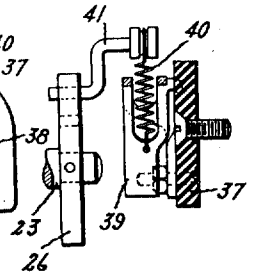



Fig. 5.




Inventor:
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# UNITED STATES PATENT OFFICE.

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## MOTOR-DRIVE.

1,232,152. Specification of Letters Patent. Patented July 3, 1917.

Application filed July 15, 1915. Serial No. 40,117.

*To all whom it may concern:*

Be it known that I, JAMES J. WOOD, a citizen of the United States, residing at Fort Wayne, in the county of Allen, State of Indiana, have invented certain new and useful Improvements in Motor-Drives, of which the following is a specification.

My invention relates to motor drives and is particularly applicable to motor drives for sewing machines.

My invention has for its object a novel arrangement and construction of parts whereby an ordinary sewing machine provided with a treadle may be readily provided with a motor drive after dropping the ordinary belt off of its drive wheel. To this end, my invention consists in mounting the motor on a base provided with projecting members, which fit into the ordinary belt holes in the table of the sewing machine. The base and motor are preferably clamped in place by making these projecting members hook shaped and relatively adjustable. When so clamped in position the motor is properly alined with the head of the sewing machine. The motor is controlled through a cord or chain passing downwardly through a hole in one of the projecting members of the base and attached to the treadle. With such a construction, it is not necessary to provide the table of the sewing machine with an additional hole for the cord or chain.

Other features of novelty which characterize my invention are pointed out in the claims annexed to and forming a part of this specification. For a better understanding of my invention however, reference may be had to the following description taken in connection with the accompanying drawing, in which Figure 1 is a perspective view of a sewing machine equipped with my motor drive; Fig. 2 is a side view of my motor and base, with the base partly in section; Fig. 3 is a sectional view on the line 3—3 of Fig. 2 with part of the base in full; and Figs. 4 and 5 are detail views of the switch for the motor.

Referring to the drawings, 1 is the supporting stand upon the top of which is mounted the usual table 2 in which is countersunk the bed plate 3 of the sewing machine. The head of the sewing machine is mounted on the bed plate 3 and consists of the usual pillar 4, horizontal arm 5, flywheel 6 and drive wheel 7, and contains the usual mechanism for transmitting motion from the drive wheel 7 to the needle bar 8. The bed plate 3 contains the usual shuttle and feed mechanism and means for transmitting motion thereto through the pillar and drive wheel. The foot power mechanism is mounted in the stand 1, and consists of a pivoted treadle adapted to transmit power through a connecting rod to a crank of a main driving wheel, power being transmitted from the main driving wheel to the drive wheel 7 through a belt which passes through belt holes 9 in the table 2. This belt is removed from the drive wheel 7 when the machine is to be driven by my motor. These parts may be of any well known or usual construction.

The motor drive for the machine comprises an electric motor 10 mounted on a base 11. The base 11 is provided with two projecting members 12 and 13 which fit into the belt holes 9 to aline the motor with the head of the sewing machine. The base and motor are preferably clamped to the table by making the projecting members 12 and 13 hook-shaped and relatively adjustable. Since the belt holes must always be properly placed for the belt from the main driving wheel to the drive wheel 7, the motor 10 will always be properly alined for driving the head of the sewing machine. The base 11 is shown as being L-shaped, the members 12 and 13 projecting from the under side of one arm and the motor being mounted on the other arm of the base. With this arrangement the motor is placed on the sewing machine back of the head and out of the way, with its shaft 14 extending parallel with the arm 5 of the head of the machine. A pulley 15 on the motor shaft thus comes in line with the drive wheel 7 and a short belt 16 transmits motion from the shaft of the motor to the head of the machine.

The projecting member 12 is preferably stationary, whereas the projecting member 13 is moved by means of a screw 17. This screw is prevented from being withdrawn from the base by a lock washer 18 and may be turned by a knurled head 19. To protect the table from being scratched by the base 11, rubber pads 20 are provided on the bottom thereof.

The motor is controlled by a brake 21

and a switch 22, both of which are actuated by a common actuating member or lever 23. A cord or chain 24 connects the lever 23 with the foot treadle. In order that no additional holes need be provided through the table for this operating member, the stationary projecting member 12 is provided with a hole 25 through which the operating member 24 passes.

The lever 23 has mounted thereon a cam 26 which is operatively connected to the switch 22 and engages a brake lever 27. This brake lever controls the brake 21 which comprises stationary and rotatable friction plates. The stationary plates 28, which may be made of fiber, have notches which engage a projection 29 on the motor frame. The inner rotatable plate 30 is fastened to the shaft of the motor. The middle rotatable plate 31 which is placed between the two stationary plates 28, is connected to the inner plate by a dowel pin 32. The outer plate 33 is also stationary. The brake lever 27 is pivoted to the frame of the motor on a pin 34 and is pressed inwardly to engage the outer friction plate 33 by a spring 35. A second spring 36, surrounding the lever 23, has one end fastened in the cam 26. The other end of this spring engages the frame of the motor. This spring tends to turn the cam to open the switch 22 and to set the brake 21.

The switch 22 is mounted on an insulating block 37 in the motor frame and comprises two stationary contacts 38 and a movable switch blade 39. The switch blade is controlled by a spring 40, one end of which is fastened thereto and the other end of which is fastened to an arm 41. The arm 41 is fastened to the cam 26 and rotates therewith and in its rotation changes the angle of pull of spring 40 on switch blade 39 so that it moves from the off position shown in Fig. 4 to the position in which the contacts 38 are connected together to complete the circuit through the motor.

The particular construction of the brake 21 and switch 22 forms no part of my present invention but is claimed in an application of mine, filed concurrently herewith.

In order to place my electric motor on a sewing machine to drive it, the ordinary belt is removed from the drive wheel 7 and dropped down so that it forms a loop from one belt hole 9 to the other. It may be entirely removed from the machine however, if desired. The base 11 with the motor is then put in position on the table 2 of the machine with the projecting members 12 and 13 of the base fitting into the belt holes 9 inside of the ordinary belt. The screw 17 is then tightened by means of its head 19 to clamp the base and motor to the machine. The belt 16 is now put on the pulley 15 and drive wheel 7 and the lower end of the chain 24 is connected to the treadle of the machine, which is in a raised position.

If the motor is connected to a suitable source of current, and the treadle is moved so as to pull downward on the chain 24, the lever 23 is rotated and with it the cam 26. The rotation of cam 26 first moves the arm 41 to throw the switch blade 39 into the position in which it connects contacts 38 to complete the circuit through the motor. The motor being a series motor immediately exerts maximum torque, but the pressure between the friction plates of the brake 21 has not been appreciably relieved and consequently the brake is still applied and the motor is prevented from rotating. Further motion of the treadle to pull downward on the chain rotates the cam 26 into engagement with the brake lever 27 and moves it so as to compress spring 35, relieving the pressure between the friction plates. The motor now begins to rotate, rotating the pulley 15 and through the belt 16, the drive wheel 7 of the machine. If the spring 35 is only partially compressed, the pressure between the friction plates is only partially reduced, and the motor and machine run at minimum speed. If the spring 35 is compressed so as to gradually relieve the pressure between the friction plates, the braking effect on the motor is gradually reduced, permitting a gradual increase in speed until maximum speed is reached.

When the treadle is gradually rocked back, the spring 36 gradually rocks cam 26 back toward the position shown in Fig. 3, the spring 35 pressing brake lever 27 against friction plate 33 and gradually increasing the friction between friction plates 28 and friction plates 30 and 31, thereby causing a gradual reduction in speed of the motor and machine until the motor is finally brought to a standstill. The spring 36 then moves the cam 26 so as to move arm 41 to change the angle of pull of spring 40 and cause it to move switch blade 39 into the disconnected position, as indicated in Fig. 4.

I desire it to be understood that my invention is not limited to the particular arrangement shown and described and I aim in the appended claims to cover all modifications which do not depart from the spirit and scope of my invention.

What I claim as new and desire to secure by Letters Patent of the United States, is:—

1. The combination with a sewing machine having a head, and a table provided with belt holes, of an electrical motor adapted to drive said head, means for controlling said motor, a cord or chain for said means and a base on which said motor is mounted, said base having projecting, hook-shaped members fitting into said belt holes and being relatively adjustable to clamp said base and said motor to said table, one of said pro-

jecting members having a hole through which said cord or chain passes.

2. In combination with a sewing machine having a head, and a table provided with belt holes of an electrical motor adapted to drive said head, means for controlling said motor, a cord or chain for said means, a base on which said motor is mounted, said base having projecting, hook-shaped members entering said belt holes, one of said projecting members being stationary, and a screw member engaging the other of said projecting members for moving the same to clamp said base and said motor to said table, said stationary projecting member having a hole through which said cord or chain passes.

3. The combination with a sewing machine having a head, and a table provided with belt holes, of an electric motor adapted to drive said head, means for controlling said motor, a cord or chain for said means, and an L-shaped base, said motor being mounted on one arm of said base, the other arm of said base having projecting members fitting into said belt holes to aline the motor with the head of the sewing machine, one of said projecting members having a hole through which said cord or chain passes.

4. The combination with a sewing machine having a head, and a table provided with belt holes, of an electric motor adapted to drive said head, means for controlling said motor, a cord or chain for said means, and an L-shaped base, said motor being mounted on one arm of said base, the other arm of said base having projecting, hook-shaped members fitting into said belt holes, one of said projecting members being stationary, and means for moving the other of said projecting members to clamp said base and said motor to said table, said stationary projecting member having a hole through which said cord or chain passes.

In witness whereof, I have hereunto set my hand this 12 day of July 1915.

JAMES J. WOOD.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."