Oct. 30, 1923. 1,472,588

C. W. H'DOUBLER

ELECTRICALLY DRIVEN SEWING MACHINE

Filed April 7, 1919

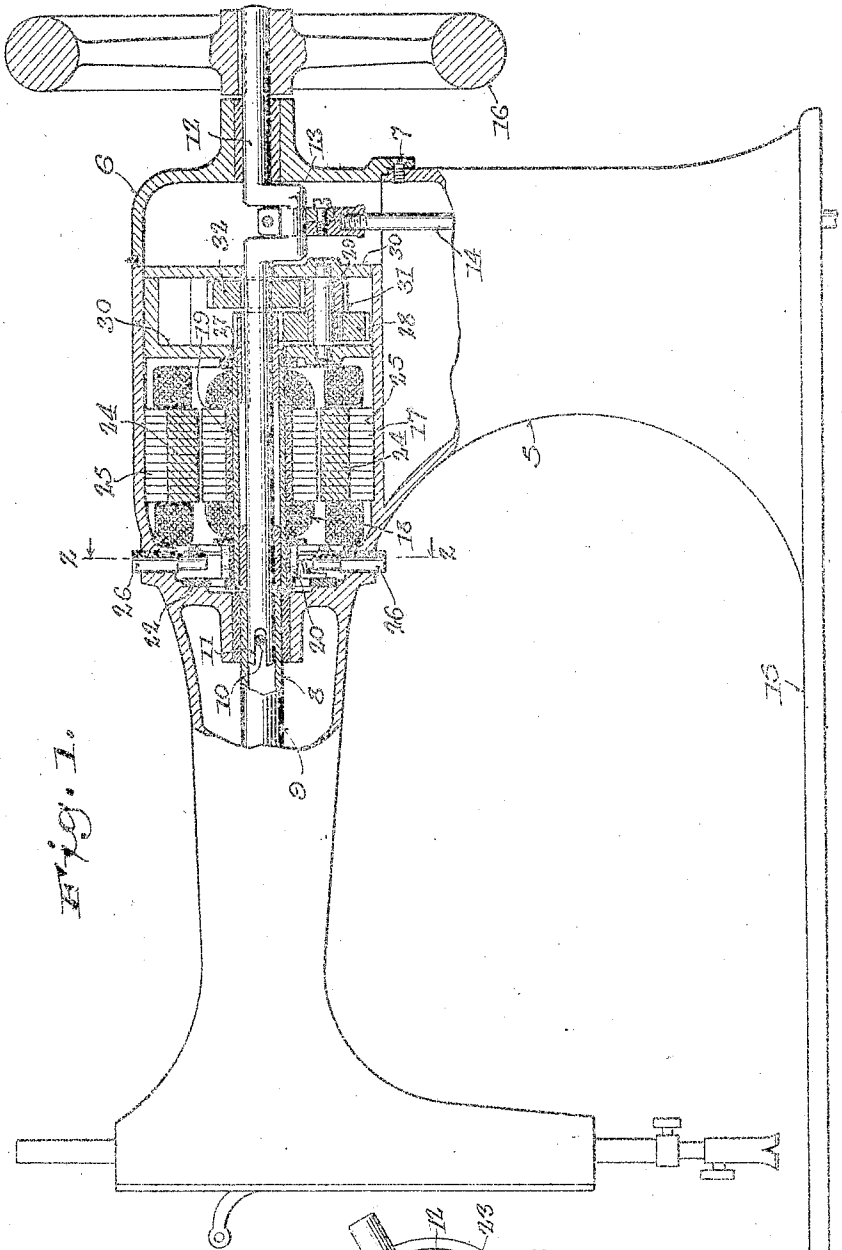


Fig. 1.

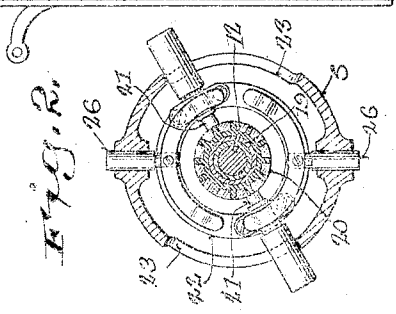


Fig. 2.

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CHARLES W. H'DOUBLER, OF MADISON, WISCONSIN.

ELECTRICALLY-DRIVEN SEWING MACHINE.

Application filed April 7, 1919. Serial No. 288,201.

To all whom it may concern:

Be it known that I, CHARLES W. H'DOUBLER, a citizen of the United States, and resident of Madison, in the county of Dane and State of Wisconsin, have invented new and useful Improvements in Electrically-Driven Sewing Machines, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

This invention relates to improvements in electrically driven sewing machines.

Sewing machines of the motor driven type now on the market are usually provided with motors as attachments which are removably mounted on the machine. These machines, while very efficient, leave much to be desired as the motors occupy considerable space and are more or less in the way. Furthermore the said constructions are not as desirable as a unitary structure.

It is one of the objects of the present invention to overcome the before mentioned objectionable features and provide an electrically driven sewing machine in which the motor is built within the arm of the machine and forms an integral part thereof.

A further object of the invention is to provide an electrically driven sewing machine which is built within the arm of the sewing machine in a manner to permit the easy removal of the motor when desired.

A further object of the invention is to provide an electrically driven sewing machine which is of simple construction, is strong and durable, and is well adapted for the purpose desired.

With the above and other objects in view the invention consists of the improved electrically driven sewing machine and its parts and combinations as set forth in the claims, and all equivalents thereof.

In the accompanying drawing in which the same reference characters indicate the same parts in all of the views:

Fig. 1 is a side view of the upper portion of the improved electrically driven sewing machine, parts being broken away to show the interior construction; and

Fig. 2 is a transverse sectional view taken on line 2—2 of Fig 1.

Referring to the drawing, the numeral 5 indicates the tubular arm or head of a sewing machine which is formed with a removable end portion 6 secured thereto by a screw 7. A two part horizontally extending shaft 8 is journaled in the horizontal portion of the arm and the removable end portion and extends through said end portion. The inner portion 9 of the shaft is of tubular form and is provided with a transverse pin 10 to removably receive the inner slotted end 11 of the other shaft part 12. Said shaft part 12 is formed with a cranked portion 13 for actuating the rod 14 which transmits motion to the ordinary feed mechanism (not shown) beneath the base portion 15 of the machine. A fly or hand wheel 16 is mounted on the outer end portion of the shaft 12.

An electric motor 17 is positioned within the horizontally extending portion of the arm 5 and surrounds the shaft part 12. The armature 18 of the motor is mounted on a sleeve 19 which is journaled on the shaft part 12. The sleeve on its inner end carries the commutator segments 20 which are engaged by the adjustable brushes 21. In order to adapt the motor to machines running in either direction the brushes 21 are of the radial type and are mounted on a ring 22 and project through elongated slots 23. The ring and brushes may be revolved a sufficient distance with relation to the pole pieces 24 of the field magnets 25 to change the polarity of said magnets and thus reverse the direction of rotation of the armature 18. The brush ring 22 is held in position by binding posts 26 which extend upwardly and downwardly through the machine arm.

The outer end portion of the armature sleeve carries a tubular pinion 27 which is in mesh with a gear wheel 28, and said gear wheel is journaled on a counter shaft 29. Spaced partitions 30 support the counter shaft. The gear wheel 28 has a pinion 31 projecting therefrom which is in mesh with a gear wheel 32 splined on the horizontal shaft part 12.

The gear train just described provides for the proper speed reduction for rotating the horizontal shaft.

The two part horizontal shaft construction and the removable end of the arm permits the easy removal of the motor when desired. In removing the motor it is only necessary to remove the screw 7 and pull the end cover 6 and the cranked portion of the shaft 12 horizontally outwardly from the machine arm. The gear casing 30 and the gears therein and the armature 18 will move

outwardly as a unit and the field magnets and the remaining parts can then be pulled outwardly as the said magnets merely slidably engage the surrounding horizontally extending casing part. The binding posts 26 may then be unscrewed from the brush ring parts and the said posts and ring parts be removed.

From the foregoing description it will be seen that the motor for driving the sewing machine may be removably positioned within the sewing machine arm to utilize space not otherwise used and that the arm forms a protection for the motor.

What I claim as my invention is:

1. An electrically driven sewing machine, comprising a tubular sewing machine head having a horizontally extending shaft in its upper arm portion, and an electric motor having a horizontally extending armature extending parallel to the horizontal shaft and mounted in said upper arm portion and approximately in co-axial alinement with said shaft having a driving connection between the armature and the shaft.

2. The combination with a sewing machine having a horizontal shaft for actuating a needle bar and a shuttle mechanism, of a motor encased within the head of the machine and having a horizontally extending armature extending parallel to the horizontal shaft and approximately in co-axial alinement therewith, and means for transmitting motion from the motor armature to the shaft at a less rate of speed of rotation than the speed of rotation of the motor.

3. The combination with a sewing machine having a tubular head provided with a horizontal shaft, of a motor encased within the head and extending around the shaft and having a driving connection therewith.

4. The combination with a sewing machine having a tubular head provided with a horizontal shaft, of a motor encased within the head and extending around the shaft, and means for transmitting motion from the motor to the horizontal shaft at a less rate of speed of rotation than the speed of rotation of the motor.

5. The combination with a sewing machine having a tubular head provided with a horizontal shaft, of a motor within the head and having an armature provided with a tubular shaft through which the horizontal shaft extends, and a geared connection between the tubular shaft and the horizontal shaft.

6. The combination with a sewing machine having a tubular head provided with a horizontal two part shaft, of a motor within the head and having an armature provided with a tubular shaft through which the horizontal shaft extends, and a geared connection between the tubular shaft and the horizontal shaft for transmitting motion from the motor to the horizontal shaft at a less rate of speed of rotation than the speed of rotation of the armature.

7. The combination with a sewing machine having a tubular head provided with a horizontal shaft, of a motor within the head and having an armature provided with a tubular shaft through which the horizontal shaft extends, a pinion mounted fast on the tubular shaft, a counter shaft mounted in the head, a gear wheel journaled on the counter shaft and in mesh with the pinion, said gear wheel having a pinion projecting therefrom, and a gear wheel mounted fast on the horizontal shaft and in mesh with the last mentioned pinion.

8. The combination with a sewing machine having a tubular head provided with an end opening and a removable end portion therefor, of a horizontal shaft journaled in the tubular head and the removable end portion, an electric motor within the tubular head and having an armature provided with a tubular shaft through which the horizontal shaft extends, said motor being removable through the end opening, and means for transmitting motion from the armature shaft to the horizontal shaft at a less rate of speed of rotation than the speed of rotation of the armature shaft.

9. The combination with a sewing machine having a tubular head provided with an end opening and a removable end portion therefor, of a horizontal shaft journaled in the tubular head and the removable end portion, an electric motor within the tubular head and having an armature provided with a tubular shaft through which the horizontal shaft extends, said motor being removable through the end opening, a pinion mounted fast on the tubular shaft, a counter shaft mounted in the head, a gear wheel journaled on the counter shaft and in mesh with the pinion, said gear wheel having a pinion projecting therefrom, and a gear wheel mounted fast on the horizontal shaft and in mesh with the last mentioned pinion.

10. The combination with a sewing machine having a tubular head provided with an end opening and a removable end portion therefor, of a two-part cranked horizontal shaft journaled in the tubular head and extending through the removable end portion, an electric motor within the tubular head and having an armature provided with a tubular shaft through which the horizontal shaft extends, said motor and a portion of the horizontal shaft being removable through the end opening, and a train of gears connecting the tubular shaft to the horizontal shaft for transmitting motion to the horizontal shaft at a less rate of speed of rotation than the speed of rotation of the tubular shaft.

11. The combination with a sewing ma-

chine having a tubular head provided with an end opening and a removable end portion therefor, of a two-part cranked horizontal shaft journaled in the tubular head and extending through the removable end portion, an electric motor within the tubular head and having an armature provided with a tubular shaft through which the horizontal shaft extends, said motor and a portion of the horizontal shaft being removable through the end opening, a pinion mounted fast on the tubular shaft, a counter shaft mounted in the head, a gear wheel journaled on the counter shaft and in mesh with the pinion, said gear wheel having a pinion projecting therefrom, and a gear wheel mounted fast on the horizontal shaft and in mesh with the last mentioned pinion.

12. The combination with a sewing machine having a tubular head provided with an end opening and a removable end portion therefor, a horizontal shaft part journaled in the tubular head and having a tubular end portion provided with a transverse pin, a horizontal shaft part journaled in the removable end portion at one end and having a transverse recess in its opposite end which engages the transverse pin of the other shaft part, an electric motor within the tubular head and having an armature provided with a tubular shaft through which one of the horizontal shaft parts extends, and means for transmitting motion from the armature to the horizontal shaft at a less rate of speed of rotation than the speed of the armature.

13. The combination with a driven shaft, of a motor for driving said shaft, comprising an electric motor having an armature provided with a horizontally extending tubular shaft through which the driven shaft extends, and means for transmitting motion from the armature shaft to the driven shaft at a less rate of speed of rotation than the speed of rotation of the armature shaft.

14. The combination with a driven shaft, of a motor for driving said shaft, comprising an electric motor surrounding said driven shaft and having a horizontally extending tubular armature shaft through which the driven shaft extends and means for transmitting motion from the armature shaft to the driven shaft at a different rate of speed than the speed of rotation of the armature shaft.

In testimony whereof I affix my signature.

CHARLES W. H'DOUBLER.