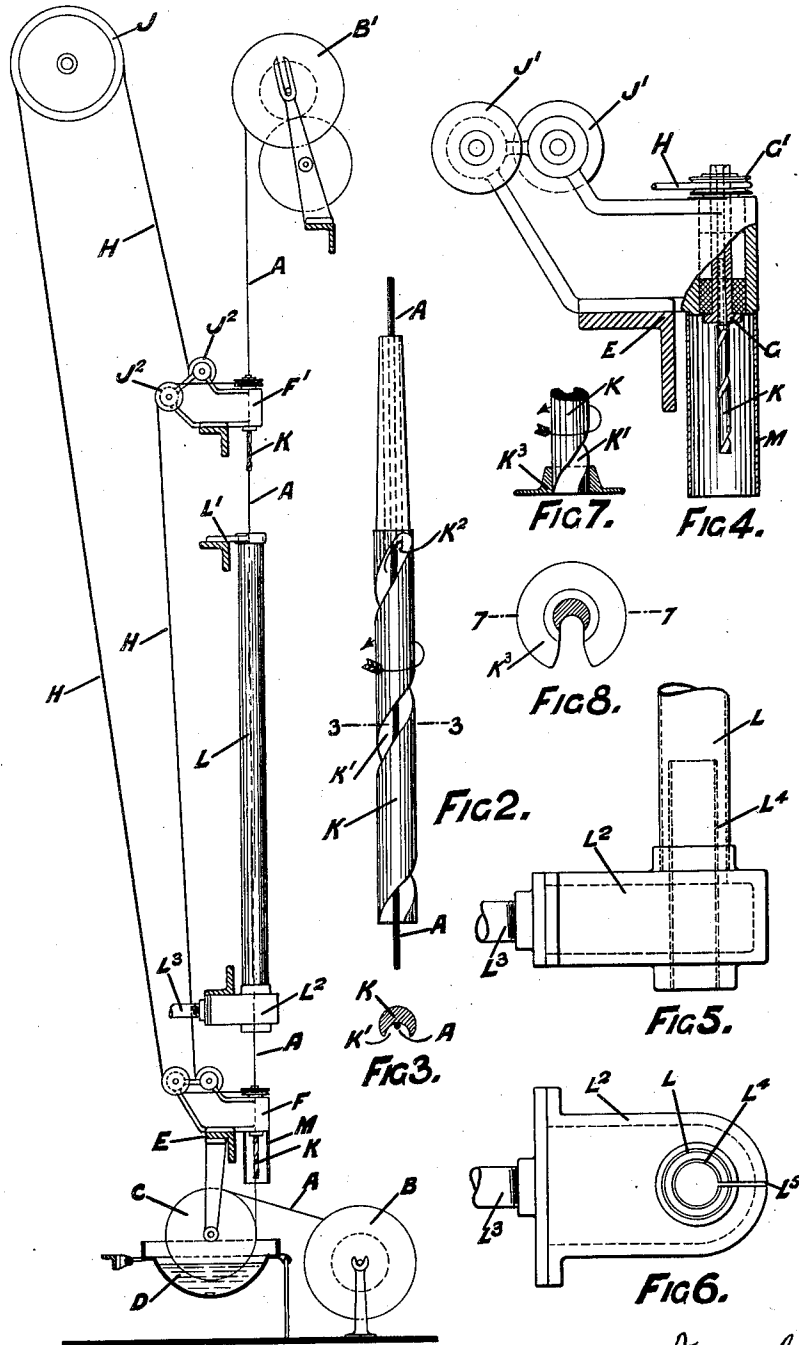


W. A. PHILLIPS & F. HUTCHINS.
 TREATMENT OF WIRES, CORDS, THREADS, AND THE LIKE.
 APPLICATION FILED JUNE 8, 1908.

902,445.

Patented Oct. 27, 1908.



Witness:
 H. S. Shepard.
 E. W. Shepard

Inventors:
 W. A. Phillips and
 F. Hutchins.
 by Bakewell, Byrnes & Parnelle,
 their attorneys

UNITED STATES PATENT OFFICE.

WILLIAM ALFRED PHILLIPS AND FREDERICK HUTCHINS, OF LONDON, ENGLAND.

TREATMENT OF WIRES, CORDS, THREADS, AND THE LIKE.

No. 902,445.

Specification of Letters Patent.

Patented Oct. 27, 1908.

Application filed June 8, 1908. Serial No. 437,365.

To all whom it may concern:

Be it known that we, WILLIAM ALFRED PHILLIPS and FREDERICK HUTCHINS, subjects of the King of England, and residing in London, England, have invented certain new and useful Improvements in the Treatment of Wires, Cords, Threads, and the Like, of which the following is a specification.

This invention relates to the treatment of wires, cords, threads and the like, and has particular reference to the polishing or finishing of the surface of wires which are covered with a fibrous material, such as cotton, coated with wax, a varnish or other substance. It is however, to be understood that the invention is applicable to the treatment of cords, threads and the like and also to the cleaning or polishing of uncovered wires.

For the purpose of this specification the invention is referred to as relating to the treatment of, say, cotton-covered wire as used for electrical purposes.

According to this invention the wire, after being coated, say by passing it through a bath of suitable substance, such for example as wax or varnish, is subjected to the action of a rotatable rubber, whereof a rubbing surface making line contact with the rubbed wire displaces it out of coincidence with the axis of rotation of the rubber. This rubber is intended to bear upon the wire for a considerable portion of its length, and is preferably in the form of a rotatable spindle having an eccentric hole or channel through which the wire is drawn. For example, the spindle may be provided with a spiral groove in which the wire lies, the depth of the groove being such as to cause the bottom to make rubbing contact with the surface of the wire.

The depth, length and pitch of the spiral groove in the rotating tool will determine the amount of the wiping and polishing action and the direction of rotation is preferably such that the excess of varnish or other coating material as it is wiped or rubbed off by the tool is thrown back into the bath from which the wire emerges. After passing through the tool, the wire is preferably drawn through a drying chamber such as a heated tube, whence it proceeds to a winding drum passing through a second polishing tool on its way, if such further polishing be desired.

In the accompanying drawings, Figure 1 is an elevation of one apparatus for the treatment of wire according to this invention,

Fig. 2 is an enlarged view of the polishing tool, Fig. 3 a section on the line 3—3 of Fig. 2, Fig. 4 an elevation with parts in section of the tool-holder and driving mechanism, Figs. 5 and 6 are respectively an elevation and a plan of the bottom portion of the drying tube. Fig. 7 is a section of a modified construction of polishing tool also according to this invention and is a section through the line 7—7 of Fig. 8, that figure being a plan of the tool. Figs. 4, 5 and 6 are drawn to a larger scale than Fig. 1, and Figs. 2, 3, 7 and 8 are drawn to a still larger scale.

Like letters indicate like parts throughout the drawings.

With reference first to Figs. 1 to 6, the wire A previously covered, say, with cotton is drawn from a drum B round a pulley C so placed that the wire is immersed in the material such as wax or varnish in a bath D. From the pulley C the wire A passes through parts of the apparatus hereinafter described and is wound on a drum B'. The pulley C is supported by a bracket attached to part of the framing E, and that portion of the framing also supports a bearing F for a tool-holder G. This tool-holder is provided with a pulley G' round which passes a driving cord H driven from a pulley J and passing over guide-pulleys J'. In the tool-holder G fits the shank of a spindle K. This spindle is formed with a spiral groove K', the depth of the groove, as may be seen by reference to Fig. 3, being shown as about half the diameter of the spindle. The shank of the spindle K is bored concentrically as at K² so that the wire A may pass up through it. Vertically above the tool K and its holder is a tube L supported, as at L¹ and L², the lower support L² being in the form of a box or chamber into which hot air or other heating agent may be conducted through a pipe L³. This heating may be accomplished by gas if desired, and a tube L⁴ is placed in the chamber L² to shield the wire A passing through it from direct contact with the fumes. A slot L⁵ allows the wire A to be placed within the tube without threading it through. After leaving the tube L, the wire A passes through a second tool K mounted in bearings F' similar to the bearings F previously described. This tool is driven by the same cord H which drives the first pulley, this cord passing over guide-pulleys J².

It will be seen from the enlarged views of the tool K shown in Figs. 2 and 3, that the

wire is displaced by the rubbing surface of the tool from the straight line which it would make if the tool were not present. This is due to the fact that the spiral groove K^1 is not deep enough to allow the wire to pass straight through. In other words, the rubbing surface maintains the rubbed wire out of coincidence with the axis of rotation of the rubber. Obviously the amount of wiping and polishing action of the tool will depend upon the degree of the displacement of the wire.

The operation of the apparatus is as follows—The drum B^1 being driven from any suitable source of power, the wire A is drawn from the drum B through the coating device D , the first tool K , the drying tube L and the second tool K . The first tool by its rubbing action polishes and finishes the coating of wax or varnish brought up by the wire from the bath D , and also owing to the shape of the spiral K^1 , and the direction of rotation of the tool, forces back the removed wax or varnish and throws it off. A tube M surrounding the tool K prevents the removed coating material from flying outside the bath and directs it vertically downwards. During its passage through the tube L , the coating is dried and if the varnish or other coating material be made with a volatile solvent which is worth recovering, the tube L may be connected to an exhausting fan for the purpose of drawing off, for condensation, the volatilized products. The wire A with its dried coating now passes through the second tool K which gives it a final polishing, and the finished wire is then wound on to the drum B^1 . In some cases, as for example when using a viscous varnish, it is desirable to increase the "throwing off" action of the tool, and for that purpose it may be provided with a flange or plate K^3 at its bottom end as shown in Figs. 7 and 8.

Although in the above description the polishing of cotton-covered wire has been given by way of example, it is to be understood that the process is applicable to wires covered with other material and coated with any varnishing, insulating, waxing, glazing or the like substance, and also that the apparatus may be used in the treatment of cords, twines, threads and the like. Further, the coating or polishing material need not necessarily be in a liquid or plastic form; a dry substance may be used, for instance, graphite or bronze powder. Or in some cases, such for example, as the lustering of yarns, cords and the like, the tool may effect the polishing by friction alone or with the aid of a lubricant such as soap. Again, the apparatus may be used for cleaning and polishing the surface of uncovered metallic wire. To prevent or lessen the wearing of the tool, it may conveniently be made of steel and hardened.

What we claim as our invention and desire to secure by Letters Patent is:—

1. In apparatus for the treatment of wires, cords threads and the like, the combination of means for moving the "wire" in the direction of its length, a rotatable rubber having a rubbing surface so disposed that it makes line-contact with the "wire" and displaces it out of coincidence with the axis of rotation of the rubber and means for rotating the rubber.

2. In apparatus for the treatment of wires, cords, threads and the like the combination of a rotatable spindle having an eccentric hole or channel, means for rotating the spindle and means for drawing the "wire" through said hole or channel in rubbing contact with the wall thereof.

3. In apparatus for the treatment of wires, cords, threads and the like the combination of a rotatable tool having an eccentric spiral groove therein, means for rotating the tool and means for drawing the "wire" through said groove in rubbing contact with the wall thereof.

4. In apparatus for the treatment of wires, cords, threads and the like the combination of a rotatable tool having an eccentric spiral groove therein, means for rotating the spindle, a coating device, means for drawing the "wire" through the coating device and through the groove in the rotating tool in contact with the wall of said groove.

5. In apparatus for the treatment of wires, cords, threads and the like the combination of a rotatable tool having an eccentric spiral groove therein, means for rotating the tool, a coating device, a drying chamber, and means for drawing the "wire" through the coating device, the groove in the tool and the drying chamber, substantially as set forth.

6. In apparatus for the treatment of wires, cords, threads and the like the combination of a rotatable tool having an eccentric spiral groove therein, a coating device on one side of said tool, a drying chamber on the other side of said tool, a second rotatable tool having an eccentric spiral groove therein and situated on the other side of said drying chamber, means for rotating the tools and means for drawing the "wire" through the coating device, the first tool, the drying chamber and the second tool successively.

7. In apparatus for the treatment of wires, cords, threads and the like the combination with a rotatable tool having an eccentric spiral groove therein of a flange or end plate, substantially as and for the purpose set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

WILLIAM ALFRED PHILLIPS.
FREDERICK HUTCHINS.

Witnesses:

GEO. H. ELLIS,
M. E. PILLEY.