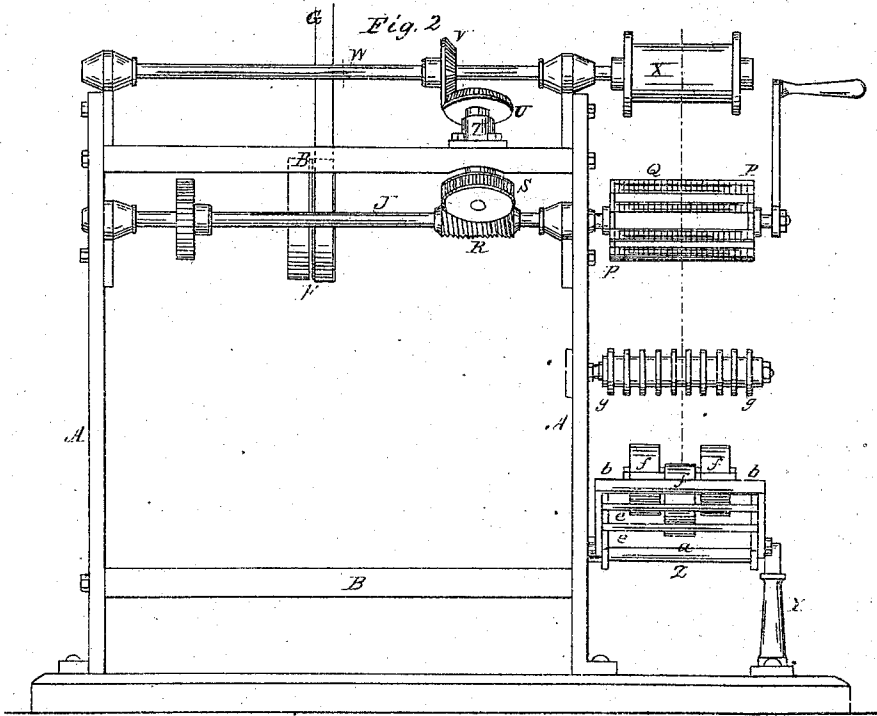
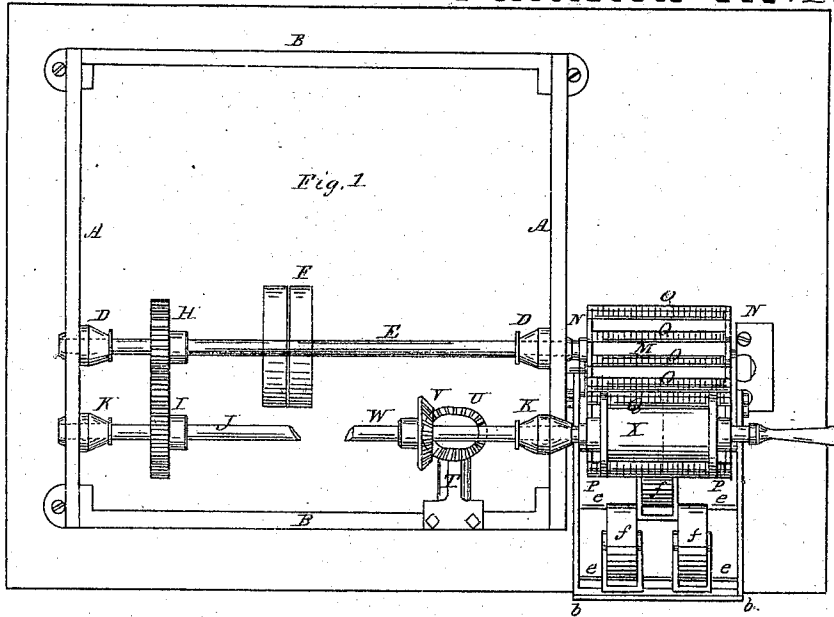


P. Kerr

Polishing Thread.

N<sup>o</sup> 74832

Patented Feb. 25, 1868.



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Fig. 4

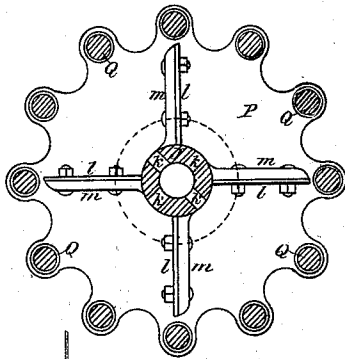
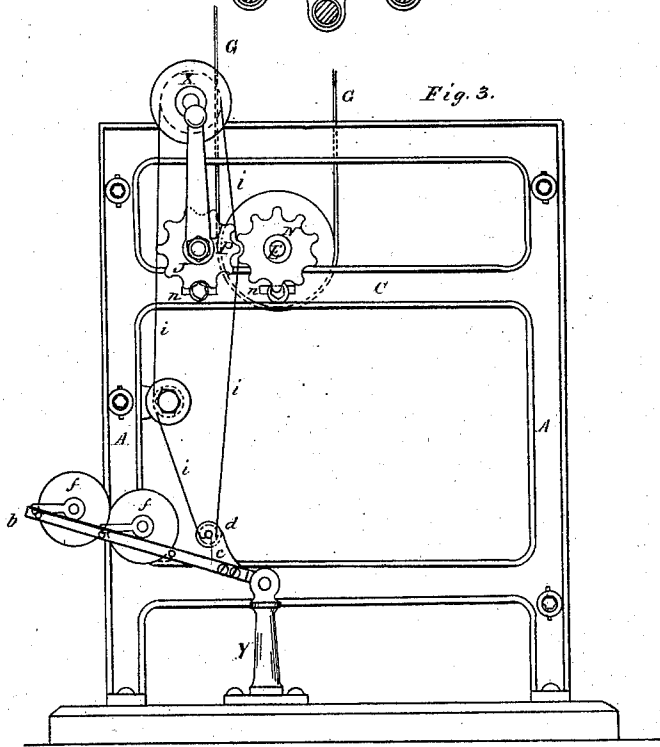


Fig. 3.



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# United States Patent Office.

PETER KERR, OF PAISLEY, ENGLAND.

Letters Patent No. 74,832, dated February 25, 1868.

## IMPROVEMENT IN MACHINE FOR POLISHING THREAD.

The Schedule referred to in these Letters Patent and making part of the same,

### TO ALL WHOM IT MAY CONCERN:

Be it known that I, PETER KERR, of Paisley, in the county of Renfrew, England, have invented new and useful Improvements in Preparing and Finishing Threads and Yarns; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a plan of one modification of my improved machinery or apparatus for preparing and finishing threads or yarns.

Figure 2 is a front elevation corresponding to fig. 1.

Figure 3 is an end view of the same.

Figure 4 is a transverse vertical section of one arrangement of a polisher for finishing threads or yarns by means of the combined agency of friction and heat.

Similar letters of reference indicate like parts.

My said invention relates to machinery or apparatus to be used for preparing, polishing, and finishing threads or yarns; the object of the improvements being the securing of a superior polishing or finishing action upon the yarns or threads by means of the conjoint action of frictional polishing-surfaces. In carrying out these improvements, it is preferred to use an open vertical framing of parallel side standards, carrying bearings for the support of the different horizontal shafts of the apparatus. These shafts are driven by central pulleys; the actual finishing-parts being upon the overhanging portions of the shafts extending beyond the limits of the central framing.

In the machine, herein described, two thread-carrying pulleys are arranged at one end of the frame, as represented, but the thread-carrying pulleys may be arranged at both ends of the frame. Both of the shafts are actuated at the proper speed directly from the prime mover, so as to carry round or along the hanks at the velocity best suited for the effect to be produced. The rubbing, polishing, or finishing-action is given to the thread-hanks by means of two separate revolving rubbers or frictional surfaces set in pairs upon the ends of corresponding horizontal shafts, which are made to revolve at a high velocity in a direction corresponding with the traverse or passage of the hanks. These polishers are so disposed that in each pair working upon one set of hanks there is one such polisher or frictional surface in the interior of the hanks, (that is embraced by the two parallel lines of the threads,) and one polisher outside or wholly exterior to the hanks. In this way both sides of the threads are fully operated upon.

The polishers are formed of vaned disks, as shown, provided with a number of longitudinal bars of metal, forming the actual rubbing-surfaces, and the contiguous polishers are geared together to work in concert, so that the vanes of each work into the intermediate spaces of the other, and the lines of threads being between them, the frictional action is materially heightened owing to the opposed resistance of the vanes. And in order still further to improve the frictional effect, the vane-bars are formed with transverse grooves all around them, so that they can be used on any side. The effect of this is, that the vanes grasp or embrace a greater extent of surfaces of the threads, and they thus operate in a more rapid manner than plain bars.

In the mechanical arrangement, shown in figs. 1 to 3, the framing A is, by preference, of cast iron, and consists of two rectangular open-panelled end-standards, united by two horizontal cross-stays, B, arranged near the upper and lower extremities of the side-standards. The middle rail, C, of each of the side-standards A has two horizontal slots cast or otherwise formed therein. In one pair of these slots *n*, fig. 3, are fitted the bushes D of the main driving-shaft E. These bushes are secured to the standards by bolts and nuts, and are consequently adjustable laterally to the extent or length of the slots *n*. The driving-shaft E has keyed to it fast and loose pulleys, which are driven by an endless belt that is actuated from a steam-engine or other prime mover. The shaft E has fast to it a spur-wheel, H, which is in gear with a corresponding wheel, I, from which the shaft J derives its motion. The shaft J is arranged parallel to the main shaft E, and its journals are carried in adjustable bushes, K, which are fitted in the slots *n* made in the middle rail of the side-standards A. The shaft E is made sufficiently long to extend some distance beyond the side-standards, and upon these projecting portions, upon either side of the machine, is fitted a metallic polisher. Each of these polishers consists of an elongated eye or tubular boss, M, which fits the shaft E tightly. Near to each extremity of the boss M is fixed a metal plate, N, the periphery of which is notched or curved to form a series of undulating projections, as is shown in the enlarged sectional view, fig. 4. These projecting parts of the plates N have holes made therein to receive the ends of a series of metal rods or bars, O, the ends of which are passed through the holes in the

plates N, and are secured thereto by nuts. The surfaces of the polishing-bars O are turned or otherwise cut to form a series of annular grooves or notches from end to end of the bars. These grooves or annular indentations serve to receive and divide the threads which are subjected to the polishing operation.

A corresponding arrangement of a pair of metallic polishers, P, is fitted upon the extremities of the shaft J. The bars Q of the polishers P are made to slightly interlock or overlap those of its contiguous and parallel polisher, and this adjustment of the two polishers may be readily and accurately obtained by means of the adjustable bushes D and K, which carry the shafts E and J. The spur-wheels H and I on the shafts E and J are of equal diameter, and the shafts therefore move at a corresponding speed, but in opposite directions. The shaft J has a worm or screw, R, turned upon one portion of its periphery; this screw gears with the worm-wheel S, the spindle of which is carried in the bush T. This bush is arranged in an angular position, and is bolted to the front upper cross-stay of the framing A. The upper end of the spindle of the worm-wheel S has fast to it a bevel-wheel, U, which gears with a similar wheel, V, keyed to the shaft W, to which it gives motion. The shaft W is carried in bushes which are bolted to the upper part of the side-standards A, and the extremities of the shaft which extend beyond the sides of the machine carry the wooden flanged-roller X. This roller overhangs the polishers so that upon one side their peripheries are in a line with the contiguous portions of the polishing-bars O and Q. A short columnar standard, Y, is bolted to the flooring at each side of the machine; these standards each carry a horizontal fixed shaft, Z, the inner extremity of which is bolted to the lower rail of the standards A. To each of the shafts Z is fitted loosely a tubular bush, a, which carries the rectangular open frame b, fig. 3. This frame b has bolted to it, near the shaft a, a pair of brackets, c, in which the spindle of the flanged-wooden roller d rotates. At equal distances along the frame b are fixed the transverse bars e, fig. 2; these bars serve to support the weights f. Above the frame b, and projecting outward from the front upright of each of the standards A, is a tension-roller, g, the spindle of which is secured to the framing of the machine by a bolt and nut fitted in a slot in the side-standard.

The hank of thread or yarn to be polished or finished, after having been starched or prepared by any of the substances usually employed, is spread over the surface of the roller X, on each side of the machine, and one-half is then passed between the polishing-bars O and Q, and under the roller d; the other half of the thread or yarn passes in front of the tension-roller g and of the polishing-bars Q; that is to say, the endless cord which the hank of thread or yarn forms, passes round the several rollers, as shown at i, in fig. 3 of my drawing, and to retain or keep each skein or hank in its place, the periphery of the tension-roller g is divided by a series of equidistant flanges, h. The shaft E being put in motion, the polishers on each side rotate in opposite directions, the thread or yarn being carried between them by the rotary movement of the roller X.

The necessary amount of tension upon the thread is regulated by means of the weights f, the number of which may be increased or diminished, at pleasure, according to the nature of the work. The threads or yarns, divided in the manner before described, are subjected to the frictional polishing action of the grooves or annular indentations in the bars of the polishers, the rotary motion of which rapidly smooths and polishes the surface of the threads or yarns. After the hanks have been sufficiently polished or finished, they are quickly released from the machine by removing the weights f and lifting the frame b; this takes off the tensional pressure, and the threads or yarns are easily removed from the rollers. Other hanks are then put on to the rollers X, and properly spread or divided, the weights f are replaced upon the frame b, the machine is again started, and the polishing operation repeated.

In fig. 4, the polishers are somewhat modified from the arrangement shown in figs. 1 to 3. In this modification the polisher consists of a central shaft, j, which is hollow throughout the length of the polisher, and open at its outer or overhanging end. This tubular part of the shaft j has a number of longitudinal slots or holes, k, cut therein, and between these slots are fitted the vanes or fan-blades l; these vanes are bolted to the radial arms m, which are cast on or otherwise attached to the shaft j at the part just within the end-plates P. The end-plates P and polishing-bars Q are similar in their construction to those hereinbefore described. In this arrangement of the polishers, the drying and finishing of the threads or yarns are facilitated by the current of air which is drawn in through the open end of the tubular shaft j, and which escapes through the slots or holes k, and is driven by the fan-blades l against the threads or yarns under operation. The air thus drawn in through the shaft j may be derived from the apartment in which the machine is worked, and consequently of the ordinary temperature, or in lieu thereof a current of heated air may be used for the purpose, if a higher temperature is found to be desirable.

With these various improvements, the process or processes of polishing or finishing threads or yarns may be effected with great facility and in a highly superior manner.

Having described the nature of my said invention, and the manner in which the same is or may be used or carried into effect, what I claim as new, and desire to secure by Letters Patent, is—

1. The machine for polishing thread, constructed and arranged substantially as herein described.
2. The construction and arrangement of the polishing-apparatus herein described, in which the thread is polished by means of rollers having grooves or indentations, said rollers working up against the thread, one inside and the other outside the hank, substantially as herein shown and described.

Witnesses:

THOS. D. FAIRLEY, }  
JNO. GILCHRIST, } Both Clerks to J. and J. Clark & Co.

PETER KERR.