H. CONANT & L. C. IVES.

DRESSING YARN.

No. 30,824. Patented Dec. 4, 1860.

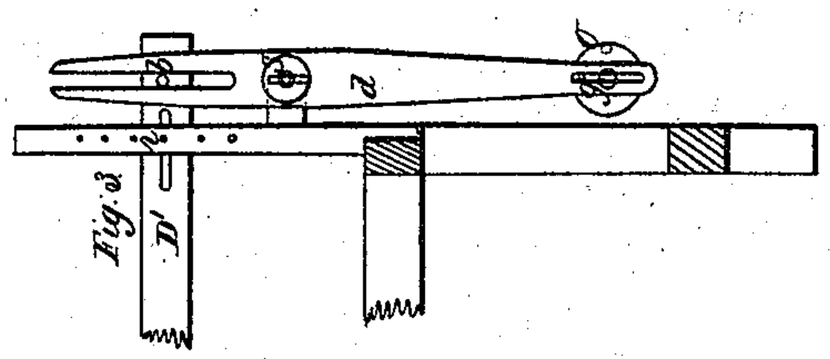

Fig. 3

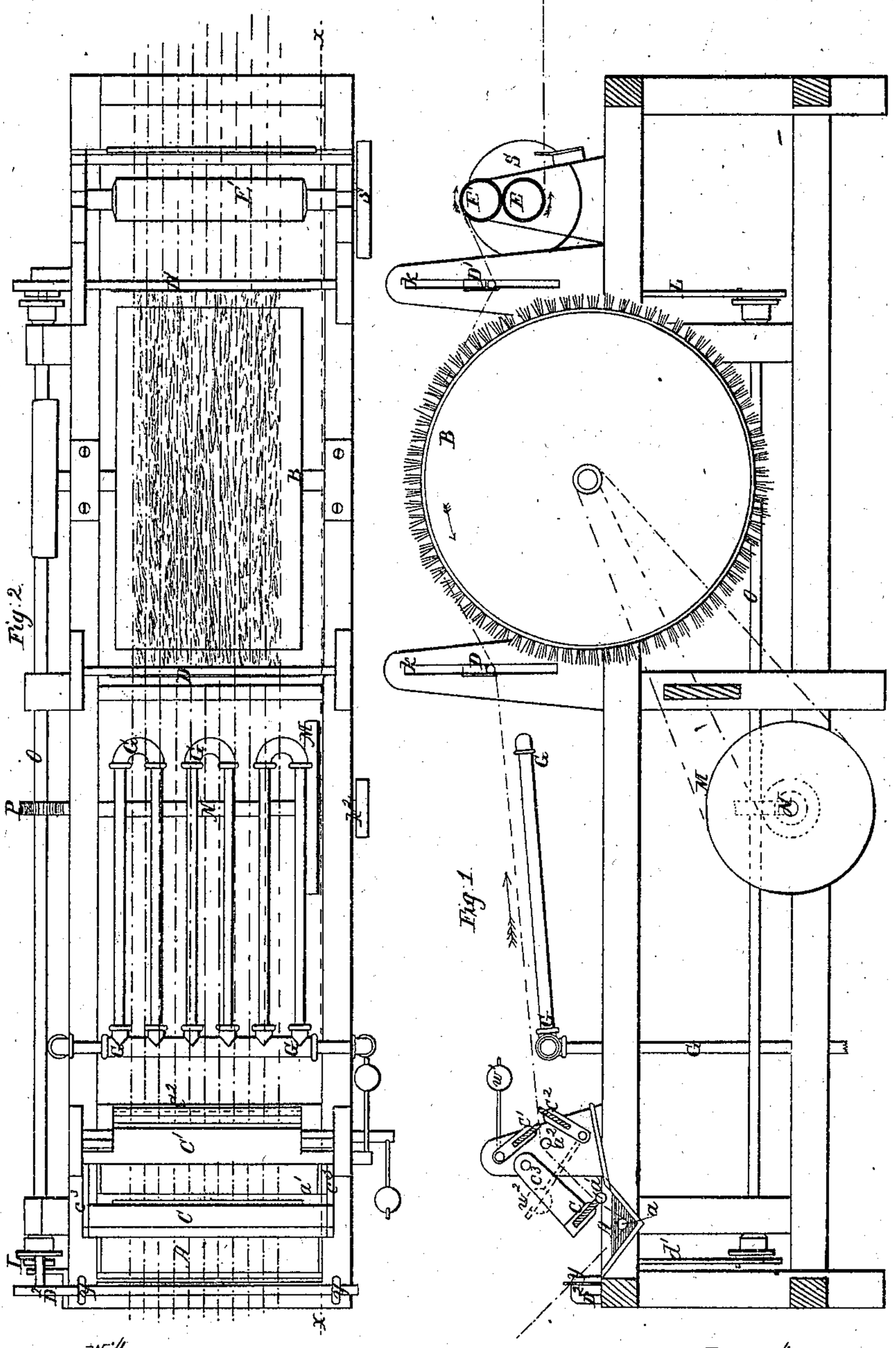

Fig. 2

Fig. 1

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UNITED STATES PATENT OFFICE.

HEZEKIAH CONANT, OF WILLIMANTIC, AND LAWSON C. IVES, OF HARTFORD, CONNECTICUT.

MACHINE FOR DRESSING THREAD.

Specification of Letters Patent No. 30,824, dated December 4, 1860.

To all whom it may concern:

Be it known that we, HEZEKIAH CONANT, at present residing at Willimantic, Windham county, and State of Connecticut, and LAWSON C. IVES, of Hartford, in the county of Hartford, in the same State, have invented certain new and useful Improvements in Machinery for the Sizing and Polishing of Thread or Sewing-Cotton or Similar Articles, and that the following specification, taken in connection with the drawings, is a full, clear, and exact description thereof.

In the drawings Figure 1 is a vertical longitudinal section through the machine in the line X X of Fig. 2. Fig. 2 is a plan or top view of the machine, and Fig. 3 is a detail drawing showing in elevation a part of the apparatus for giving a transverse motion to the thread being sized and polished.

We have been led to these improvements by careful consideration of machinery now in use for the purpose of sizing and polishing sewing thread, noticing its defects and its excellencies and having in view the construction of a more simple machine less costly to use and keep in repair and more certain and correct in its action.

In the sizing and polishing of thread by machinery now in use and known to us there are certain difficulties. The first arising from the fact that different parts of long lengths of thread are exposed to different degrees of tension during the operation and while wet with size, which causes the thread when finished to be of different numbers or of different degrees of fineness in various parts of its length although the hank or skein of thread before being sized was of equal fineness throughout. A second difficulty arises from the use of a number or series of rapidly revolving brushes, which act on the thread in succession immediately after it has left the sizing vat and before it has been dried. The brushes cost a good deal in the first place, take some power to run them up to speed, and as they are obliged to take up all the moisture from the yarn soon become saturated with wet and must be removed and dried and cleansed. Another difficulty arises from the yarn proceeding from the vat directly to the first of the series of brushes. Sometimes in spite of wipers or nippers to remove the superfluous size too much size is carried along by a certain part of the length of thread and when this part arrives at the first brush the overplus of size is flung off by the brush into the air and it often falls on and damages the finished thread. All these defects of the machines in use and known to us are remedied by our present invention.

In the drawings is represented a strong frame of wood which supports the shafts and various acting parts of the machine and on it is mounted at the front of the machine a rod D^2 extending across the frame and free to slide crosswise in proper guides such as *y*. This rod may be notched on the upper side or have extending upward from it small wires or pegs between which the various threads to be sized and polished pass; these threads are represented in the drawings by red lines. Immediately behind this sliding rod is a vat or cistern A which is to contain size and extending across this vat is a small rod *a* which we prefer to make of glass under which the thread passes; extending also across this vat but above the surface of the size is another similar rod *a'* upon which rests the edge of a wiper *c* hung on arms c^3 pivoted to two standards one of which rises from each side of the frame; this wiper by its own weight rests against the rod *a'*. Between these two standards and supported by them is another rod a^2 and pivoted onto the same standards are two other wipers *c'* c^2 the former of which is caused to press downward by a ball or weight *w'* supported on a rod which passes through a hole in the shaft of the wiper. The wiper c^2 is caused to press upward by a similar weight w^2 and both of the rods on which the weights are supported are capable of being moved through the holes in the shafts so that the force with which the wipers are respectively forced downward and upward may be regulated. The edge of the size vat is extended under all these wipers so as to receive and save size that may be removed by them. Next in order along the frame is a series of pipes G G. This series extends across the frame or nearly so and has proper connections for carrying off condensed water and through which the series may be supplied with steam. Behind this series and supported in proper slotted standards is a rod D. This rod can be raised and lowered in the slots *k* and may be sustained at any proper point by pins or set screws and may if desired be so constructed as to traverse across the frame in the

manner to be afterward described in relation to the rods D^2 and D′. In proper journals behind this rod D is supported the shaft of a rotating brush B and this brush is capable of rapid rotation when a moving belt is applied to the pulley keyed on its shaft and plainly shown in Fig. 2. Behind this brush passing through slots *k* in other standards is a rod D′ whose ends are slotted as seen in Fig. 3 and through these slots pass pins so that the rod may be supported at any desired height and is still free to slide crosswise of the frame. In one end of this rod is a pin *b* which is embraced by the slotted end of a lever *d* pivoted at *s* and in the lower end of this lever is another slot into which enters a pin *g* which protrudes from a disk keyed on a shaft O which runs lengthwise of the machine, the whole contrivance being such that when the shaft revolves the rod D′ shall be caused to traverse to and fro crosswise of the machine. This rod D′ should have wires or pins projecting from its lower side or it may be notched and the rod D^2 is provided with a similar apparatus by means of which it is also caused to move sidewise across the machine. Behind this rod D′ are other standards in proper journals in which is supported a roller E which we prefer to cover with felt or india-rubber and on the shaft of this roller is a belt pulley S. Immediately above this roller is another E′ similar to it whose journals are free to slide up and down in slots in the standards. This roller rests on the former one or on threads passing between the two and is moved by friction only.

A belt not shown in the drawings is to pass around the axle of the brush and thence around a pulley M on a shaft N. This shaft carries an endless screw which engages with a worm P on the shaft *o* thus causing that shaft to revolve slowly when the brush is in motion. Another pulley K^2 is supported on the shaft N and around this latter pulley a belt is to be placed which also surrounds the pulley S so that the roller E will also revolve when the brush revolves but at a much lower rate of speed. The relative velocities of the brush the take up roller E and the traversing rods may be varied as necessity requires in any proper manner.

The rods D D′ are adjustable as to their height in order to determine how much of the circumference of the brush the threads shall pass over. The roller E′ is free to slide up and down so as to accommodate its position to varying numbers of thread. The weights on the wipers are adjustable so that greater or less force may be brought to bear to lay the fibers and to produce tension on the thread and the acting surfaces of the wipers are best made of felt or some similar material let into a sort of stock as plainly shown in the drawings thus affording facility for removal and replacement of the wiping surface.

Having thus described the machine we will now proceed to describe the manner in which it operates. The thread after it comes from the dye vat or the bleaching works is to be wound on proper spools which are then to be placed in an ordinary frame so that each spool is free to turn, the threads from a number of these spools are then to be led over the rod D^2 under the rod *a* between the rod *a′* and its nipping wiper *c* thence over the rod a^2 between the wipers c' c^2 over the heating pipes under the bar D over the brush, under D′, over the roller E′, between it and E, then under E, and thence to spools arranged in a frame and caused to revolve by friction so that each spool can only take up the thread as fast as it is delivered by the rollers E E′. Steam is now to be supplied to the heating pipes, the size box is to be supplied with size, and motion is to be given to the brush and consequently to the other parts connected therewith. The thread will then pass as shown in the red lines, be saturated with size in the vat, have the surplus size removed by the first nipper *c* acting against the rod *a′* at which time the fiber will be partially laid, and then receive a second nip between c' and c^2 when the fiber will be laid down close, when all superfluous size will be removed and the thread pinched so hard as to cause it to move over the brush under sufficient tension. As the thread goes over the pipes the size will be nearly dried, sufficiently so as to fit it properly for the action of the brush, which will polish the thread as it passes over it.

The thread is drawn over the brush by the take up rollers which take up constantly, or equal lengths in equal numbers of revolutions, and when the thread leaves them it will be so dry that it can not be stretched and consequently reduced in diameter even though the bobbins to which it then passes and on which it is wound should at times tend to take up more rapidly than at others.

During all these operations the thread will by the rods D′ and D^2 (and D also if fitted properly) be forced to move slowly crosswise of the machine and then back again, thus bringing into action all parts of the surface of the nippers and brush causing them to wear equally, giving their surfaces time to dry and preventing the difficulties hereinbefore pointed out. And it will be noticed further that owing to the use of the take up rollers the thread will remain under equal tension until dried, consequently its diameter will not vary in different parts of the same hank; and it will also be observed that owing to the location of the steam apparatus between the vat and the brush that thin size may be used which

saturates more equally and also that the size will be dry or nearly so when the threads reach the brush, thus doing away with the necessity of a series of brushes and preventing the brush from throwing size about the room.

We state that we are aware of the fact that a size vat, nippers, a reciprocating brush, and a drying apparatus have been used in combination in a machine for dressing warps, arranged in such order that the drying apparatus acts after the warp threads have been brushed; but this apparatus would not answer our purpose for two reasons first because a reciprocating brush is practically useless for polishing thread and second for the reason that in polishing thread it is important to dry it before it is subjected to the action of the polishing brush or brushes. We therefore do not claim such an apparatus but

Having thus described our improved machine for sizing and polishing thread we claim as of our own invention—

1. In combination with a size vat, swinging wipers for making tension and laying fiber substantially such as described and this we also claim when the wipers are fitted with adjustable weights substantially as specified.

2. In combination with a size vat and a rapidly rotating brush and nippers or any proper device for preventing the too rapid withdrawal of thread a constant take up motion consisting of friction rollers or their equivalents from which thread passes onto bobbins or their equivalents substantially as specified for the purpose set forth.

3. In combination when arranged in the order herein described, first, a vat for size; second, nippers or wipers or their equivalents for removing surplus size and laying fiber; third, a steam apparatus or any equivalent thereof for the purpose of drying size and, fourth, a rapidly revolving brush all acting in combination under a mode of operation substantially such as is described, and these four elements or parts of a whole apparatus arranged in the order as described, in combination with a traverse apparatus and a constant take up or either of them.

In testimony whereof we have hereunto subscribed our names in the town of Hartford on this 31st day of October A. D. 1859.

HEZEKIAH CONANT.
LAWSON C. IVES.

In presence of—
JAMES L. KENIA,
ELISHA JOHNSON.