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D. H. CAMPBELL.

MACHINE FOR WAXING THREAD AND WINDING THE SAME ON SHUTTLE BOBBINS.

No. 409,270. Patented Aug. 20, 1889.

Fig. 1.

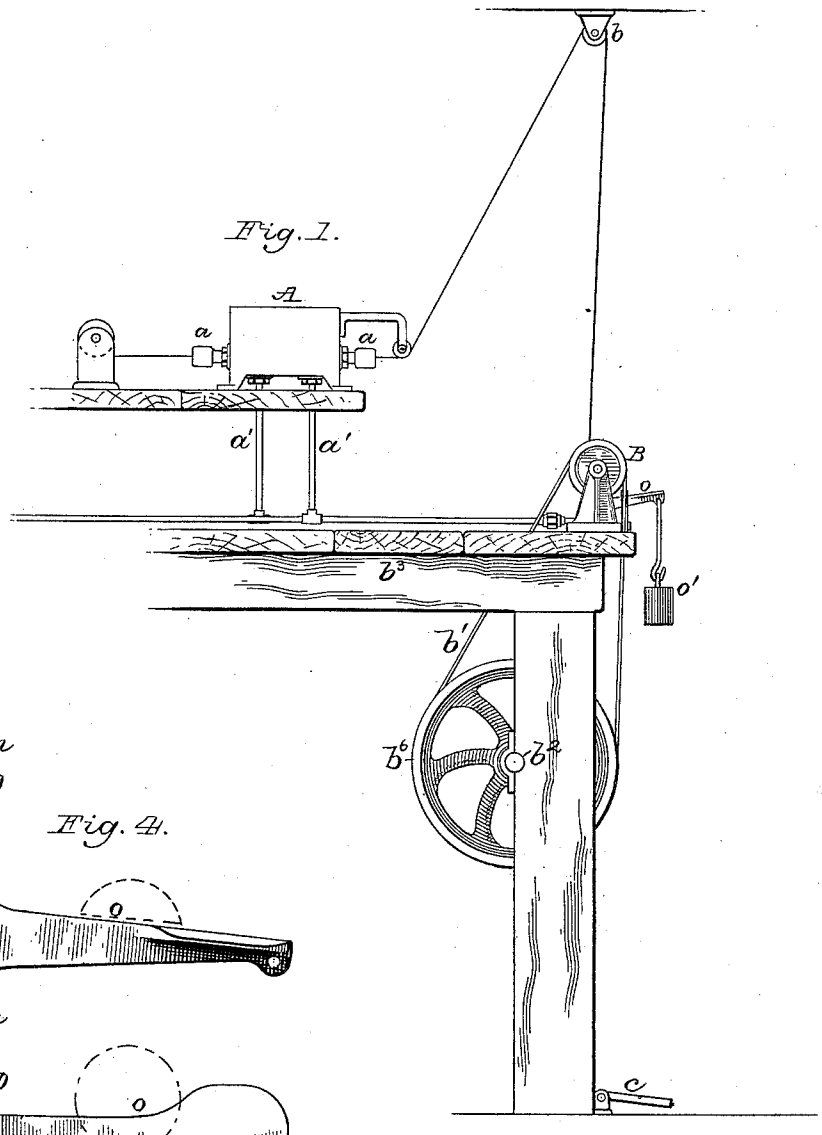

Fig. 4.

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Fig. 2.

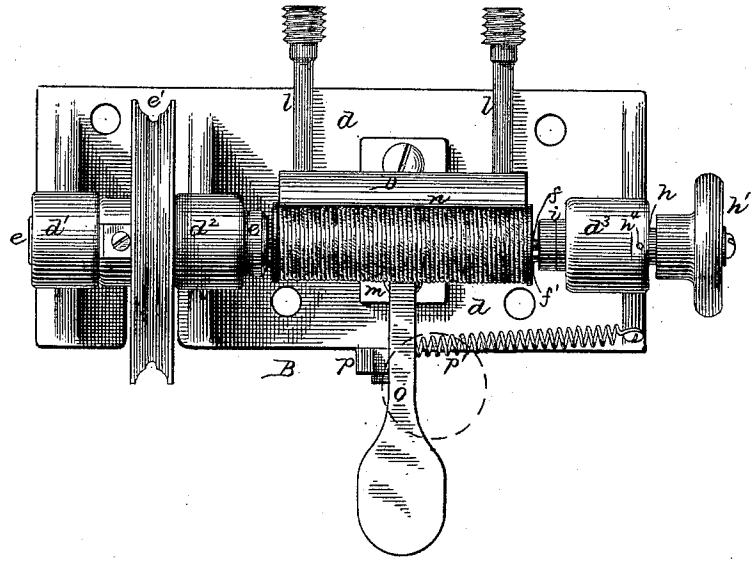

Fig. 3.

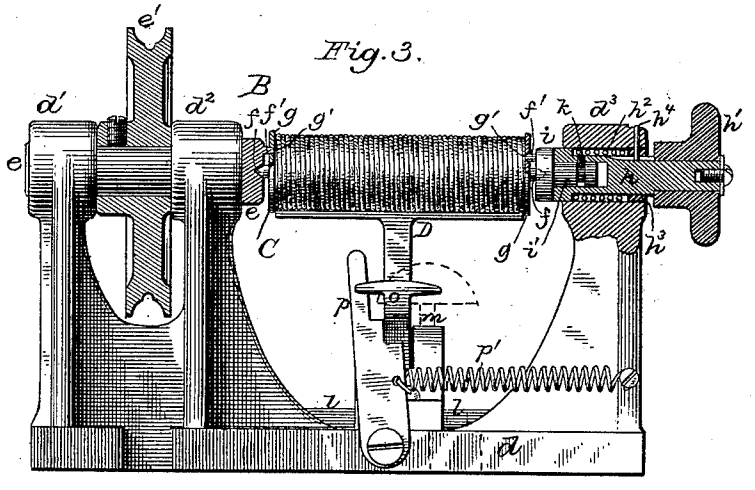

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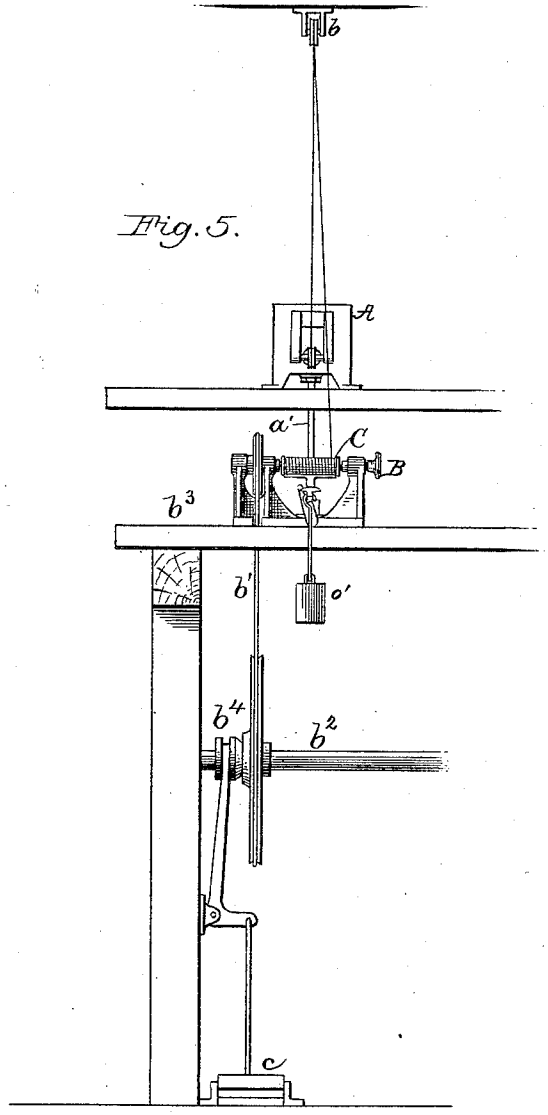
Fig. 5.



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UNITED STATES PATENT OFFICE.

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MACHINE FOR WAXING THREAD AND WINDING THE SAME ON SHUTTLE-BOBBINS.

SPECIFICATION forming part of Letters Patent No. 409,270, dated August 20, 1889.

Application filed June 18, 1885. Serial No. 169,149. (No model.)

To all whom it may concern:

Be it known that I, DUNCAN H. CAMPBELL, residing at Pawtucket, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Machines for Waxing Thread and Winding the Same on Shuttle-Bobbins; and I do hereby declare that the following specification, taken in connection with the drawings furnished and forming a part of the same, is a clear, true, and complete description of my invention.

In my application for Letters Patent filed March 25, 1885, Serial No. 160,095, I have shown, described, and claimed certain improvements in machines for waxing and winding thread in cops for use in sewing-machine shuttles; and I employ some of said mechanism in my present machine.

I have now devised a complete machine, embodying a wax-cup and mechanism for winding bobbins, so that the waxing and bobbin-winding can be performed at one operation. I have also provided in my machine for relieving the bobbin centers from wear by employing rotating chucks, with which the bobbin rotates; and I have also combined with the bobbin-chucks a heated convex-faced presser-bar, which is so proportioned in its length to the bobbin that it occupies the space between the inner faces of the flanges of the bobbins used and properly packs the thread as it is wound, and also causes the return or traverse movement of the thread after each layer has been wound.

For enabling a proper understanding of the status of my present invention, I will first state that my waxing and cop-winding machine, disclosed in my aforesaid application, cannot be employed for bobbin-winding, nor can the machine now disclosed be relied upon for cop-winding. In both machines a presser-bar is used, and for the same purpose, and in both cases the bar is heated, and in each case said bar exactly conforms in length with the length of the mass of thread coiled; but in the cop-winding machine said length is restricted to the space between the faces of portions of the machine itself—namely, a rotating bushing and a chuck, both being mounted in bearings, while in the bobbin-winder provision is and must be made for receiving and driving a flanged bobbin, and the length of the coiled mass of thread is restricted to the space between the bobbin-flanges, and therefore the heated presser-bar must accurately fill this space longitudinally. Heretofore machines adapted to wax-thread sewing have embodied wax-cups and bobbin-winding mechanism provided with a thread-finger controlled by a traverse-motion scroll, but having no presser-bar. Machines for ordinary sewing with dry or common thread have heretofore been provided with bobbin-winders, and some of these have had a presser-roll mounted on springs and a thread-finger operating as a part of a traverse motion. In British Letters Patent No. 2,935, of 1878, a dry-thread bobbin-winding machine is shown, in which there is a double presser-bar which in cross-section is V-shaped, and it is mounted upon a spring. At the side of said bar at which the thread approaches the bobbin the ends of the bar are "rounded off," and hence it does not fill the space between the flanges of the bobbin, as in my machine. In said prior English machine certain horizontal bars are interposed between the bobbin and a tension device, so that the thread passes over one of said bars and under the other, closely adjacent to the bobbin, said bars being rotative in their seats and of a certain peculiar form, which enables them to operate as traverse-bars. Now, my bobbin-winding machine differs from any other waxed-thread bobbin-winding machine known to me, first, in that the presser-bar performs all the service that any prior presser-bar performs or can perform, and, in addition thereto, without the aid of a curved thread-bar or a swinging thread-arm or any other thread-guiding contrivance, it performs the service of a traverse motion, and this latter function depends upon having the presser-bar exactly occupy longitudinally the space between the heads of a proper bobbin when placed in the machine, and instead of being rounded off at its ends, as in said English patent, my bar is squared up so as to exactly conform to the inner faces of the bobbin-flanges, and, secondly, my presser-bar is provided with means by which it can be properly heated; or, in other words,

instead of being mounted upon and supported by one or more springs, as in said prior dry-thread bobbin-winders, it is in the form of a lever, mounted in a standard traversed by steam-pipes, or provided with other suitable means for heating it, so that as the waxed thread is laid, whatever the derangement of the wax on the thread may be, it will be corrected by the hot presser-bar. By so devising the presser-bar that it performs this new duty I am enabled not only to dispense with all traverse-motion mechanism, but also to avoid all that liability to abrasion and stripping which is necessarily incident to the use of all such mechanism as heretofore organized, although it is not to be understood that the mere addition of such mechanism to my machine need necessarily involve any departure from my invention.

To more particularly describe my invention, I will refer to the accompanying drawings, and after a full description of the machine illustrated the features deemed novel will be specified in the claims hereunto annexed.

Referring to the drawings, Figure 1 is a side elevation of my machine complete. Fig. 2 is a top view of the winding-machine. Fig. 3 is a partial side view and longitudinal central section of the winding mechanism. Fig. 4 illustrates the presser-bar detached, in two views. Fig. 5 is a front view of the machine complete.

The wax-pot A is as shown and described in my aforesaid application. For the purposes of this specification said cup need only be described as being provided with heating-pipes a', and as having two tubular heads a, through which thread is drawn by the winding mechanism; and also that it is so located with reference to the latter that the thread can be drawn from the cup upward and thence over a wheel b down to the bobbin-winding mechanism. This wax-pot and its tubular heads contain novel features of my own invention, which constitute the subjects of claims in other applications for Letters Patent filed by me. (See Serial Nos. 155,708 and 188,704.)

The winding-machine B is mounted on a stand or table, which also supports the wax-cup, and is driven by a cord or belt b' from a pulley b^6 on a shaft b^2 beneath the table, provided with a clutch b^4, which is controlled by the treadle c, as in my cop-winding machine.

The winding-machine proper has a metal bed-plate d and standards d', d^2, and d^3. The standards d' and d^2 afford bearings for a short shaft e, having a grooved pulley e' secured thereto. The inner end of this shaft or driven bobbin-chuck is centrally bored to receive the projecting bearing f of a metallic bobbin C, and it has also a projecting pin or stud f' for entering a hole g' in the flange g of the bobbin, and thus locking therewith for driving it. The standard d^3 affords a housing for a sliding spindle h, provided with a knob h' at its outer end. This housing is chambered to receive an expansive spiral spring h^2, which surrounds said spindle, and has abutments against a shoulder on the spindle and a collar h^3, secured within the housing by a pin h^4, which also projects into a longitudinal groove in the spindle for preventing its rotation. The inner end of the spindle is chambered to afford a bearing for the auxiliary bobbin-chuck i, which has a tail-piece or journal i', provided with an annular groove occupied loosely by a small radial screw k in the spindle, thus permitting the chuck to freely rotate while securely confined in its bearing. This chuck i has a central hole in its face to receive one axial center of a bobbin, and also a pin or stud f' to occupy a hole g' in one flange g of the bobbin. Other means may be employed for causing the chucks and the bobbin-flanges to engage with each other without departure from my invention.

With the parts thus constructed and organized it will be obvious that the spindle is to be retracted for inserting a bobbin, and that when the latter is in place and prevented from rotation the driven chuck will speedily seat its pin in the adjacent bobbin-flange and then rotate the bobbin, which will be at once automatically engaged at its opposite end by the pin of the chuck i, and that thereafter the bobbin will be rotated without friction or wear upon either of its axial centers, which I deem important, because said centers should be maintained in as perfect condition as possible to secure proper operation in a shuttle.

The presser-bar D, to obtain desirable results, must be long enough to exactly fill the longitudinal thread-space of the bobbin—*i. e.*, the space between its flanges g—and it is provided with a heating-pipe l, which by passing through the standard m, on which said bar is mounted, causes the latter to be well heated at its convex face n. The presser-bar is in the form of a bell-crank lever, and to its lower arm o a weight o' (not shown in Figs. 2 and 3) is attached for causing the bar to press at its convex face with uniformity upon the waxed thread during the winding operation. A vertical catch-arm p is pivoted on the base-plate, and has shoulders or steps at its edge. This catch-arm is placed alongside the arm o of the presser-bar and is lightly held against it by a retractile spring p', so that as the bobbin fills the presser-bar face is moved rearward and the arm o rises until on passing the shoulders on the catch-arm the latter is drawn by its spring toward said arm o and enables the catch-arm to strike a bell, (see dotted lines, Figs. 2, 3, and 4,) to indicate when the last layer of thread on a bobbin has been commenced. The upper step or notch on the catch-arm enables the weight of the presser-foot to be supported during the introduction or removal of a bobbin.

In setting up the machine for operation care should be taken to locate the thread-wheel b in line with the central portion of the bobbin when in position for winding, so that the an-

gle of the vertical thread will be the same when winding at both ends of the bobbin, and thus enable the presser-bar to cause the initial return movement of the thread after each layer is completed and produce results similar to those of well-known traverse mechanism.

While I prefer to wax and wind at one operation-previously-waxed thread may be wound, in which case the wax-cup, if empty, but heated, will serve both as a tension-regulating device and a heater for properly softening the wax on the thread preparatory to winding and enabling it to be properly compacted on a bobbin.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, substantially as hereinbefore described, of a heated wax-pot, and a bobbin-winding machine having a presser-bar of a length exactly corresponding to the length of the thread-space of the bobbins to be wound, and means for heating said presser-bar, said bar operating to compress and heat the waxed thread as it is laid upon a bobbin and also causing the initial return movement of the thread after completing each coil in contact with either head of the bobbin.

2. The combination, substantially as hereinbefore described, of the driven bobbin-chuck, the sliding spindle, the revolving bobbin-chuck thereon, and a heated presser-bar having a length equal to the space between the flanges of bobbins to be wound.

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Witnesses:
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WM. H. HODGES.