No. 690,493. Patented Jan. 7, 1902.

S. W. WARDWELL.

COP TUBE CARRIER.

(Application filed July 30, 1901.)

(No Model.) 3 Sheets—Sheet 1.

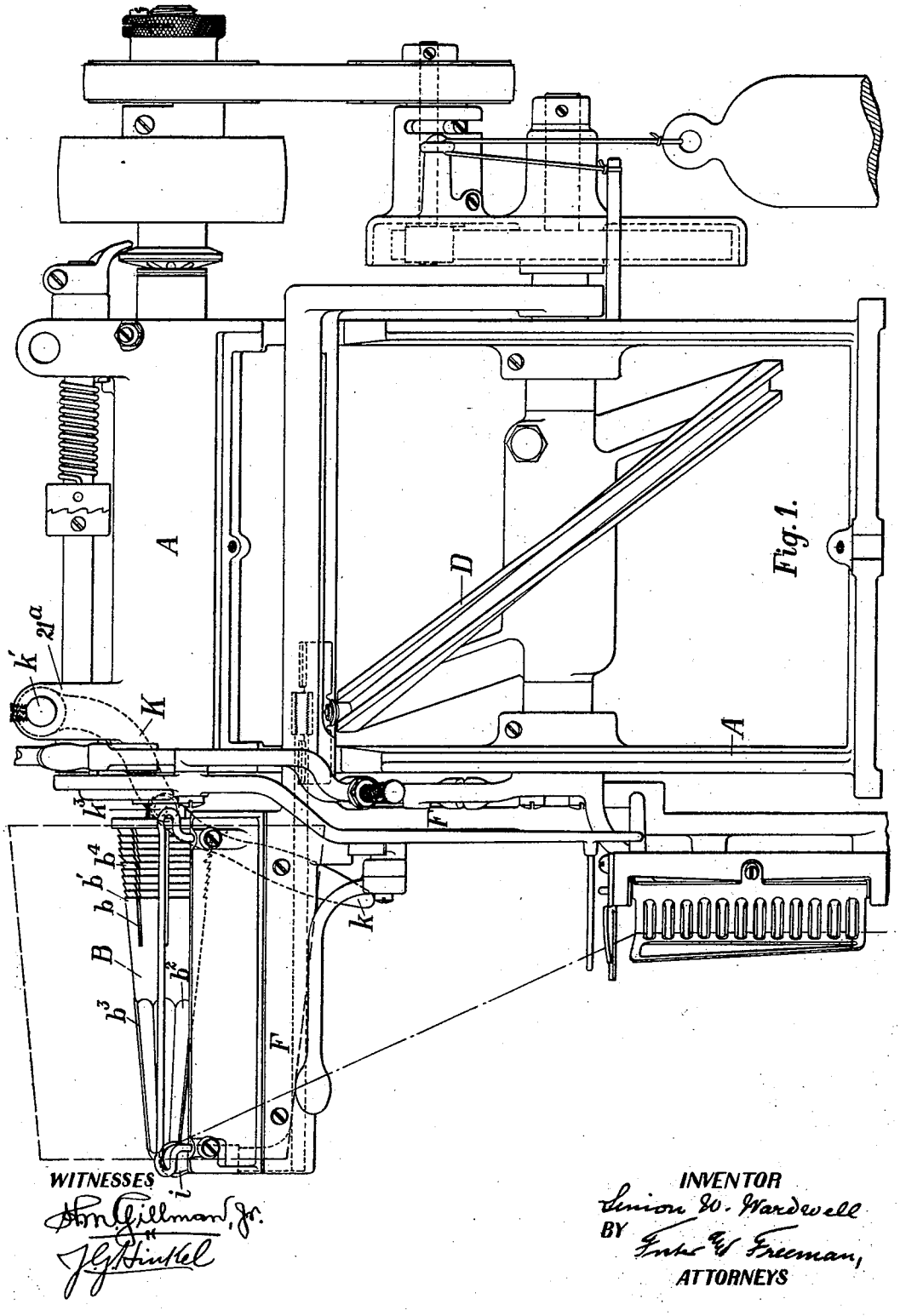


Fig. 1.

WITNESSES

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3 Sheets—Sheet 2.

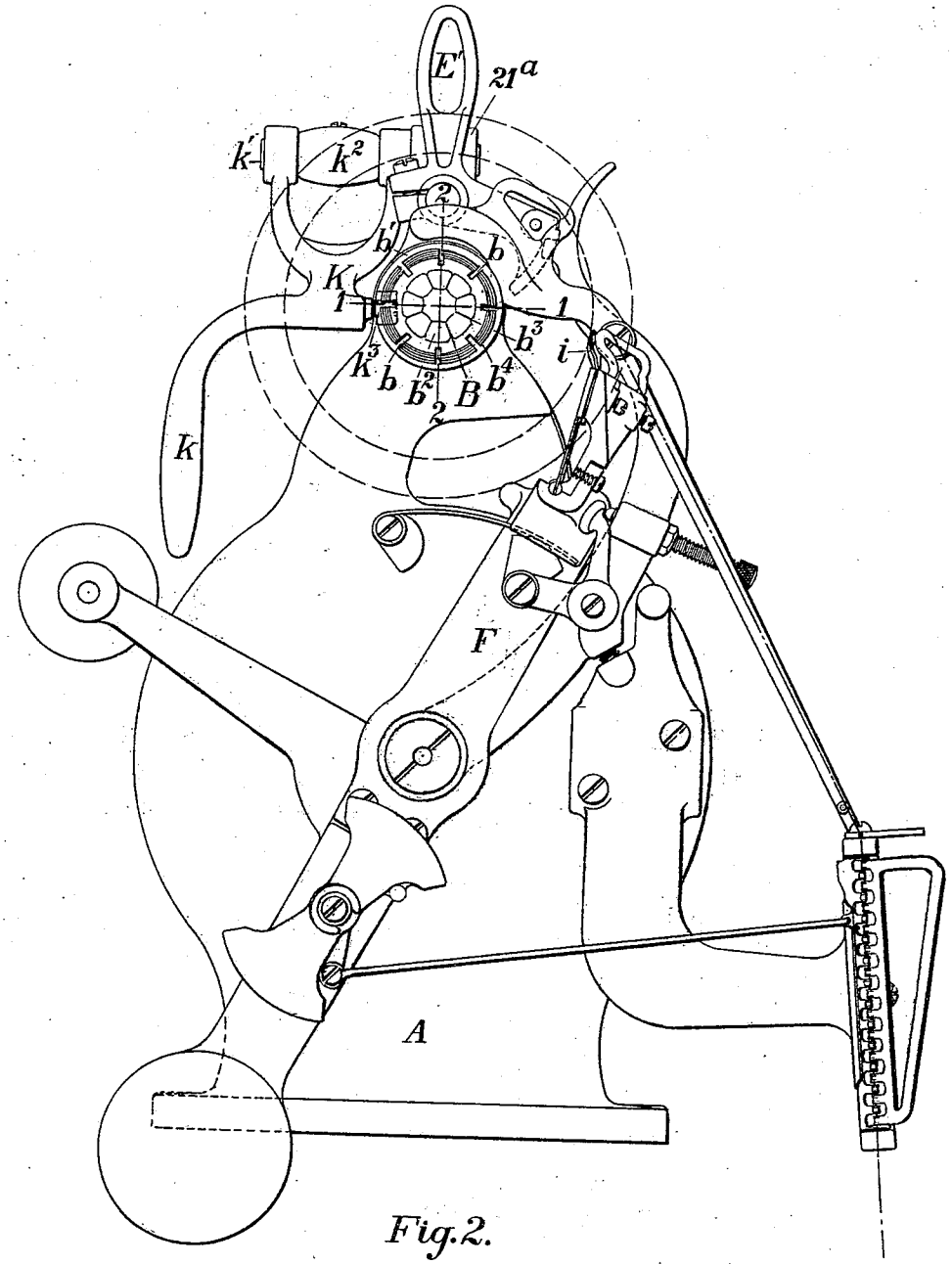


Fig. 2.

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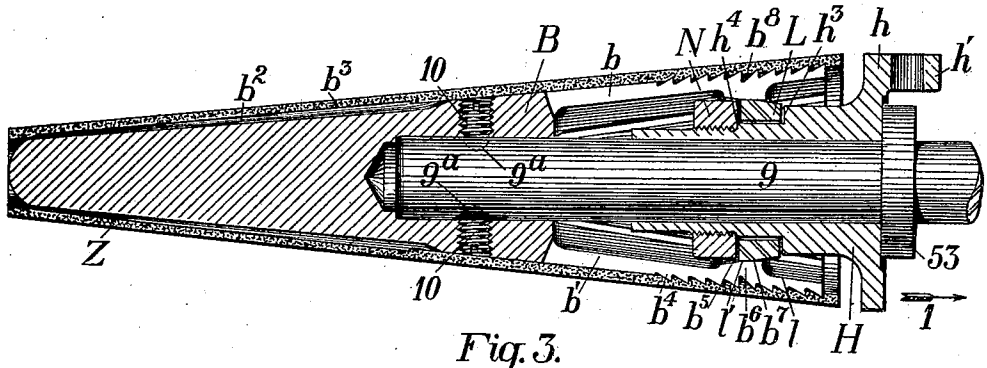


Fig. 3.

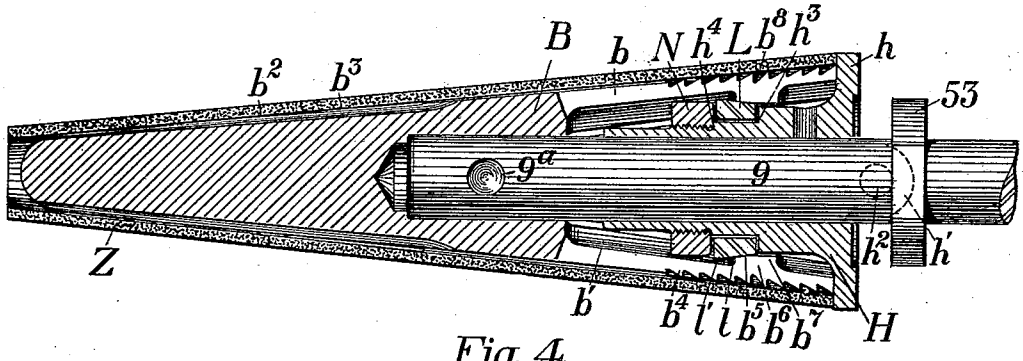


Fig. 4.

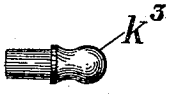


Fig. 5.

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UNITED STATES PATENT OFFICE.

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COP-TUBE CARRIER.

SPECIFICATION forming part of Letters Patent No. 690,493, dated January 7, 1902.

Application filed July 30, 1901. Serial No. 70,252. (No model.)

To all whom it may concern:

Be it known that I, SIMON W. WARDWELL, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Cop-Tube Carriers, of which the following is a specification.

My invention relates to improvements in winding-machines, and especially to the attachments for retaining and rotating the tube or shell on which the cop is wound, the object of my improvement being to provide devices for securing the tube on the winding-spindle in the quickest possible time with a minimum expenditure of energy and in such manner that it may be released with ease and despatch.

The following is a complete description of my invention and its operation, the peculiar and novel structural features being illustrated by the accompanying drawings, in which—

Figure 1 is a front elevation of the machine, showing the attachment in place; Fig. 2, an end elevation of the same; Fig. 3, a section of the tube-carrier on the line 1 1, Fig. 2, showing the tube engaged; Fig. 4, a section of the same on line 2 2, Fig. 2, showing the tube released; and Fig. 5, a view showing in detail pin k^3.

For convenience I describe my invention as applied to a machine of the type described in my Letters Patent Nos. 536,672 and 567,871, in which a winding-spindle and a cam D are supported and rotated in bearings in the frame A and a thread-guide *i* is reciprocated opposite the spindle and pressed against the package wound, with connections carried by the swinging frame F for reciprocating the thread-guide from the cam and devices for regulating its reciprocation in relation to the rotation of the winding-spindle. The drawings herewith submitted show also several features of improvement not embodied in the Letters Patent referred to nor disclosed in this specification, but which form the subject-matter of a separate application, Serial No. 70,253, filed concurrently herewith.

I have shown in the drawings a carrier having a formation especially adapted for the reception of conical cop-tubes; but it will be evident that the principles hereinafter described are also applicable to cylindrical cop-tube carriers.

The tube-carrier B is fastened firmly to the end of the winding-spindle 9 by suitable means—as, for instance, by the set-screws 10, adapted to fit into the recesses 9^a of the spindle 9. (Shown in Fig. 3.) The end of the tube-carrier adjacent to the winding-machine is recessed, as indicated in Figs. 3 and 4, to admit the devices for securing the tube in place. The cuts *b b*, &c., Figs. 1 and 2, divide one end of the surrounding shell into segments *b'*, rendering it capable of being expanded beyond its normal diameter. Its outer end is preferably provided with longitudinal corrugations or flutes b^2, meeting in the knife-edges b^3, which extend a suitable distance along the carrier, in this instance nearly half its length, and which project above its main or body portion throughout the distance, though this feature is not essential for all kinds of winding.

The cop-tube Z, formed of paper, pulp, wood, or similar yielding material, is held from rotating on the carrier by the engagement of the knife-edges b^3 with its inner surface and is further retained in position by the expanding end of the carrier, which is provided with a series of peripheral projections or teeth b^4, which project above its body portion and by their incision into the tube secure it against both longitudinal and rotative movement.

To effect the engagement of the tube as above described, I provide devices for expanding the inner end of the tube-carrier which are simple, durable, and effective, and which are operated by a single simple movement of the operator's hand.

The forked lever K, provided with a handle portion *k*, is pivoted to the frame A, as shown in Figs. 1 and 2, on a rod *k'*, held in lug 21^a of said frame by a set-screw or other equivalent means and carrying a collar k^2 between the forks of the lever K to retain the latter in position.

Adjacent the collar 53 of the winding-spin-

dle and extending into the cup-shaped cavity of the tube-carrier B is a sleeve H, free to slide on the spindle and formed at its projecting end with a flange h, carrying a lug h', in which is a cylindrical hole adapted to receive and engage with the spherical head of a pin k^3, (shown in Fig. 5,) which projects from a lug on lever K. Intermediate its extremities the sleeve H carries a collar or ring L, free to rotate thereon, but held from longitudinal movement by a shoulder h^3 and by a second collar N, screwed against the shoulder h^4 or secured by other suitable means. The ring L is of substantially tapered section, having the bevel l extending through a portion of the width of its peripheral surface and adapted to engage a corresponding bevel b^5 of the annular projection b^6 on the inner surface of the carrier B, so that when the sleeve H is slid on the spindle toward the frame A in the direction of the arrow 1 by means of the lever K this engagement forces the segments b' of the carrier outward to engage the teeth b^4 with the inner surface of cop-tube Z, as shown in Fig. 3. To hold the carrier expanded and prevent the segments from springing back to their normal position when lever K is released from the operator's hand, the cylindrical section l' of collar L is provided to engage the corresponding cylindrically-shaped section b^7 of projection b^6 when sleeve H is at its extreme inward travel against the collar 53, thereby removing the beveled surface from a contact which would be liable to allow the sleeve H to be forced back into the position indicated in Fig. 4 by the contracting tendency of the segments b'.

Between the two teeth on the outer surface of carrier B nearest opposed to the projection b^6 on the inner surface a groove b^8 is formed deeper than the adjacent grooves, adapting the segments b' to be bent or bowed out at this point when expanded in order that the teeth away from the end of the carrier may be sunk into the cop-tube an equal depth with those at the end.

The operation of the mechanism described is as follows: The operator pushes the tube snugly onto the carrier B and secures it thereon by simply pressing the lever K toward the frame of the machine, thereby moving the sleeve H along the spindle, and by the pressure of collar N on the expanding-ring L engaging the beveled surfaces l and b^5 to wedge out the toothed segments b' b' until said ring is forced into the position shown in Fig. 3, where it is held by frictional contact, rotating with the carrier about the sleeve H, the latter being held from rotation by the engagement with the lug h' of the pin k^3 on the lever K. When the cop is completed or for any reason the tube is to be removed, the operator by pulling the lever K out from the frame disengages the ring L, allowing the segments to contract to release the tube Z, and the flange h on sleeve H, bearing on the inner end of said tube when the sleeve is slid out, forces it off free and loose, as shown in Fig. 4.

Without limiting myself to the precise form of structure set forth, I claim—

1. The combination in a winding-machine, of a cop-tube carrier, means for expanding the same, and a handled lever connected to operate said means, by a movement of said lever in a plane substantially parallel to the axis of rotation of the cop-tube carrier, substantially as described.

2. The combination with a winding-spindle, of an expansible cop-tube carrier rotated thereby, a sliding sleeve, a ring held longitudinally on the sleeve but free to rotate thereon, and means acting through said ring to expand the tube-carrier by the longitudinal movement of said sleeve, substantially as described.

3. The combination in a winding-machine, with a rotary spindle, of an expansible tube-carrier rotated thereby, a sliding sleeve on the spindle having a beveled section, an oppositely-beveled section on the tube-carrier, and a lever pivoted to the frame of the machine to effect the engagement of said beveled surfaces to expand the carrier, substantially as described.

4. The combination in a winding-machine, with a rotary spindle, of a tube-carrier rotated thereby, a cup-shaped cavity at one end of the carrier, a plurality of cuts dividing the shell thereby formed into segments, an annular beveled section on the interior of said cavity, a sleeve extending into the cavity and provided with an oppositely-beveled ring, a flange on said sleeve with a lug, a pin to engage a hole in said lug, and a lever carrying said pin and pivoted to slide said sleeve on the spindle to expand the carrier, substantially as described.

5. The combination with a winding-spindle, of a cop-tube carrier having a shell-formed section, cuts dividing said shell into segments, beveled sections on said segments, a sleeve carrying a beveled ring to engage said beveled sections to expand the segments, and cylindrical surfaces adjacent the beveled sections to be engaged after said expansion to retain the segments in their expanded positions, substantially as described.

6. The combination with a winding-spindle, of a tube-carrier rotated thereby, a shell-formed section of said carrier having expansible segments, a sliding sleeve to expand said segments, and a flange on said sleeve to engage the cop-tube to force it free of the tube-carrier when said sleeve is moved to allow the contraction of the segments, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SIMON W. WARDWELL.

Witnesses:

ARTHUR A. ARMINGTON,

WILLARD J. ALLEN.