

No. 674,078.

Patented May 14, 1901.

F. CREE, SR.

WINDING THREAD AND APPARATUS THEREFOR.

(Application filed July 15, 1899.)

(No Model.)

2 Sheets—Sheet 1.

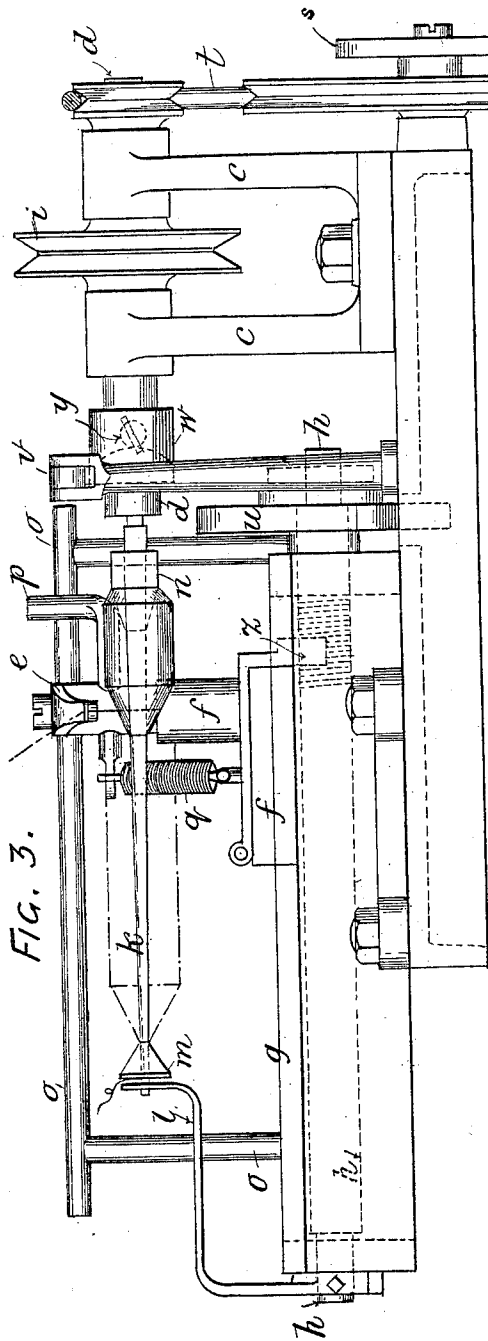


FIG. 3.

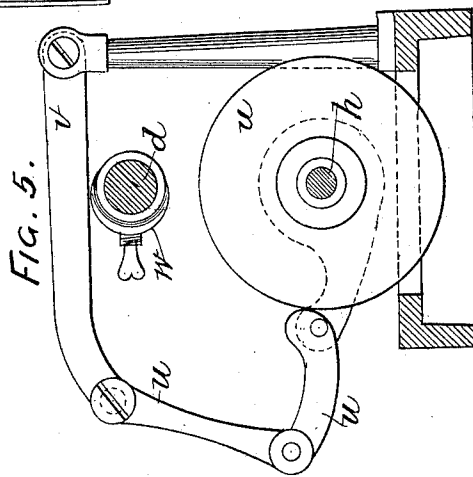


FIG. 5.

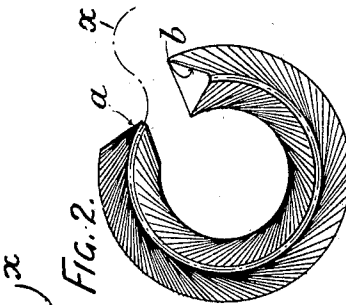


FIG. 2.

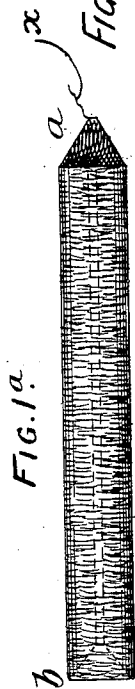


FIG. 1a.

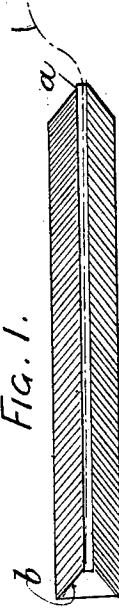


FIG. 1.

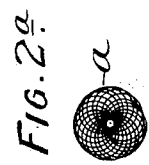


FIG. 2a.

WITNESSES:

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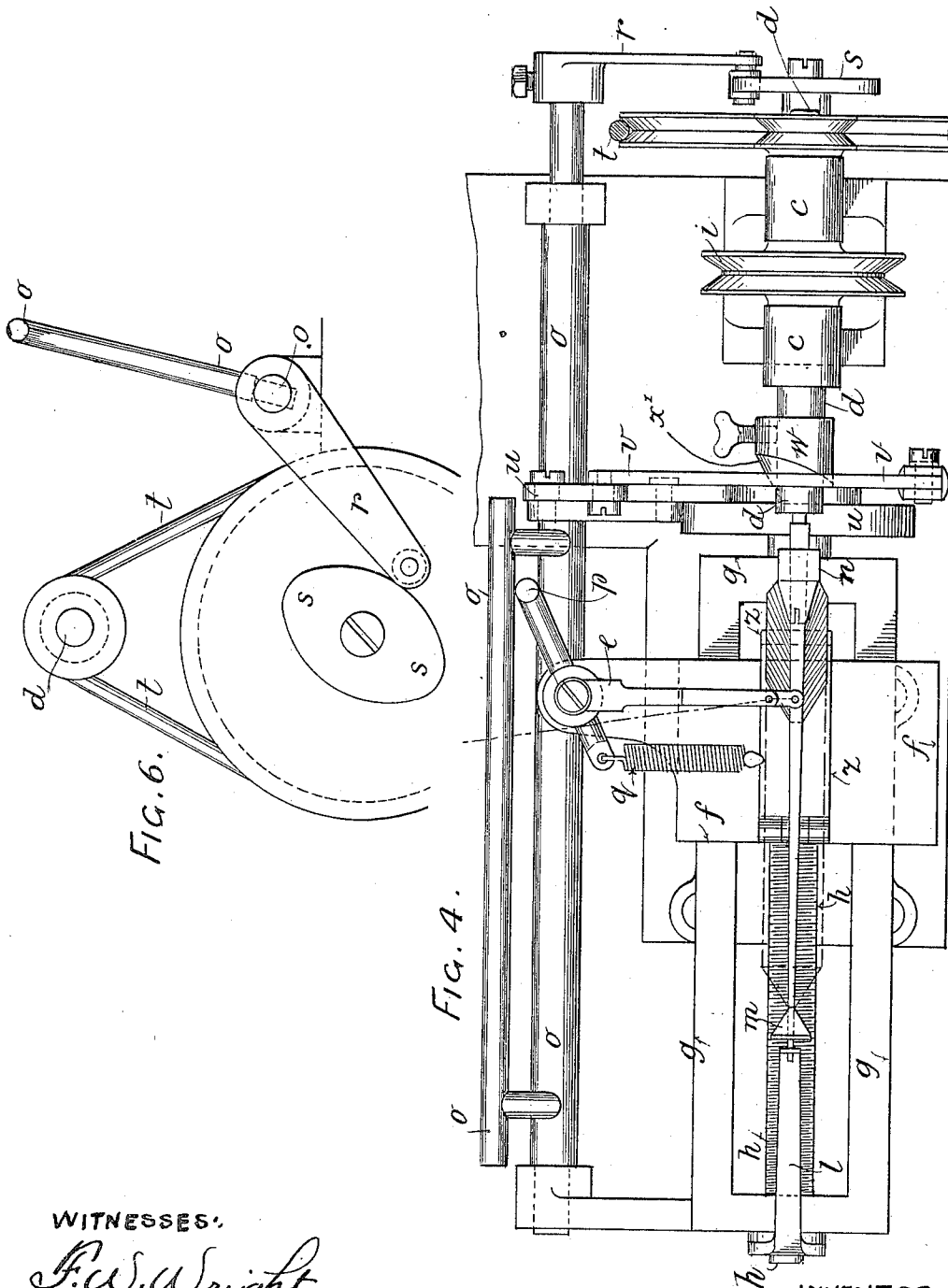
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UNITED STATES PATENT OFFICE.

FRANCIS CREE, SR., OF DENTON, ENGLAND, ASSIGNOR OF THREE-FOURTHS
TO GEORGE WORSLEY AND ALBERT ERNEST WORSLEY, OF AUDENSHAW,
ENGLAND.

WINDING THREAD AND APPARATUS THEREFOR.

SPECIFICATION forming part of Letters Patent No. 674,078, dated May 14, 1901.

Application filed July 15, 1899. Serial No. 723,994. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS CREE, Sr., a subject of the Queen of Great Britain and Ireland, residing at Denton, in the county of Lancaster, England, have invented Improvements in Winding Thread, of which the following is a specification.

This invention relates to the winding of sewing-thread into a long cylindrical cop with conical ends, more especially for use in lock-stitch sewing-machines provided with revolving carriers for the under or lock thread.

Figure 1 on the drawings is a longitudinal section of a long cylindrical cop of sewing-thread with conical ends wound in accordance with my invention. Fig. 2 is a similar view showing the same bent or curved into a circular form to fit into the revolving carrier of the lock-stitch sewing-machine. Fig. 1^a is an outside view of the cop, and Fig. 2^a a view of the pointed conical end of the cop, showing the crossing of the coils. Fig. 3 is a side elevation of an apparatus for winding such cops of sewing-thread. Fig. 4 is a plan view of the same; and Figs. 5 and 6 are detached views, hereinafter more particularly referred to.

The improvement in winding thread according to my invention consists in laying the end *x* of the thread along the spindle from point *a* to butt and then winding the thread in the form of a long cylindrical cop (see Fig. 1) built up of a series of cones of crossed and superposed coils, so that one end *a* of the cop forms an obtuse cone and the other end *b* a reversed or hollow cone. The cop thus produced has the delivery end *x* of the thread extending from the hollow rear or butt end *b* through the hollow center and projecting out at the nose end *a*, so that as it is drawn off at the rear end and out at the nose the cop will remain of the same diameter and solidity, but will diminish gradually in length at the rear end *b*.

My invention enables a cop containing a very considerable length of sewing-thread (say from one thousand to fifteen hundred yards) to be used as the under or lock thread of a sewing-machine in a continuously-revolving carrier without any tendency to cause

the thread to snarl or kink by overtwisting. The machine by which I propose to wind the sewing-thread in this manner forms the subject of an application for a patent filed by me November 14, 1899, Serial No. 736,987, and consists principally of a head-stock *c*, (see Figs. 3 and 4,) carrying a revolving spindle-holder *d*, in combination with a reciprocating thread-guide *e*, mounted on a carriage *f*, sliding horizontally upon a bed-plate *g* and actuated by means of a slowly-revolving screw *h*. The spindle-holder *d* is fitted with a small grooved pulley *i*, driven rapidly by an endless band from a larger pulley, which is actuated by foot, hand, or other power. The spindle *k* is tapered and its butt-end fits tightly in the holder *d*, its extreme end being steadied by a spring-support *l*. This end is fitted with a loose cone *m*, between which and the thinner end of the spindle *k* the end *x* of the thread to be wound is held tight. The thread is laid along the length of the spindle *k* from the tip to the butt-end, which is provided with a cone *n*. The bed-plate *g* extends longitudinally below the spindle *k*, and the carriage *f*, which slides along the bed-plate *g*, supports the thread-guide *e*, which is in the form of a lever moving to and fro horizontally over the spindle *k*. This thread-guide *e* is moved horizontally in one direction by means of a rocking bar *o*, acting against a finger *p*, and in the reverse direction by means of a coiled spring *q*. The rocking bar *o* is actuated by a lever *r*, (see also end view Fig. 6,) which is held by the spring *q* against a double cam *s*, driven by an endless band *t* from the head-stock spindle-carrier *d*. In order that the guide *e* may be so moved as to lay the thread on lines the most effective to hold the superposed and crossed coils, as hereinafter described, the cam *s* should have the parabolic curves shown.

The screw *h* for traversing the thread-guide carriage *f* is caused to make a portion of a revolution intermittently by means of a jointed grip motion *u*, (see also end view Fig. 5,) connected to a lever *v*, actuated by an eccentric or cam *w*, mounted on the spindle-carrier *d*, and the working surface of this eccentric or cam *w* is made conical, as shown at *x'*, Fig.

4, so that by shifting it endwise on its spindle *d* by means of the regulating-screw *y* the diameter of the cop may be varied.

The half-nut *z*, (see Fig. 3,) which works
 5 on the screw *h*, is hinged to the carriage *f*, so that it can be lifted out of gear with the screw *h* when it is desired to move the carriage by hand to the extreme right, so as to commence winding a fresh cop. The slowly progressive
 10 motion of the thread-guide carriage and the to-and-fro motion of the thread-guide will cause the thread to be wound on the spindle in a series of superposed cones from end to end in the form shown at Fig. 1. The thread
 15 after being laid along the spindle from tip to butt and the winding begins will be laid in spiral coils extending from the base to the tip of the cone and back again, Figs. 1^a and 2^a, to form the superposed cones, and the succes-
 20 sive spiral coils will cross and bind each other in place, and as this crossed spiral coiling is moved progressively forward from butt toward the tip of the spindle a long cylindrical cop is formed of such a character that it can
 25 be bent around into a curved form without breaking. As the delivery end of the thread extends from the base of the cop through the interior and is drawn out at the nose, it will be drawn off from the hollow base without
 30 snarling or kinking.

I claim as my invention—

1. The mode herein described of winding thread into long cops, consisting in laying the end of the thread along a winding-spindle from tip to butt and then winding the thread
 35 spirally backward and forward into superposed conical layers throughout the entire length of the cop from base to tip, crossing successive coils over each other and advancing the crossed spiral coiling progressively
 40 forward with the delivery end of the thread lying in the hollow center.

2. As a new article of manufacture, a long hollow cylindrical cop with conical nose and hollow conical base from which in use the
 45 thread can be drawn through the interior of the cop, the thread being laid spirally backward and forward in successive layers, and the spirals crossing and binding each other, the delivery end of the thread extending from
 50 the conical base through the hollow interior of the cop and projecting at the nose whence it can be drawn off, substantially as described.

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

FRANCIS CREE, SENIOR.

Witnesses:

GEORGE DAVIES,
 J. ERNEST HUGHES.