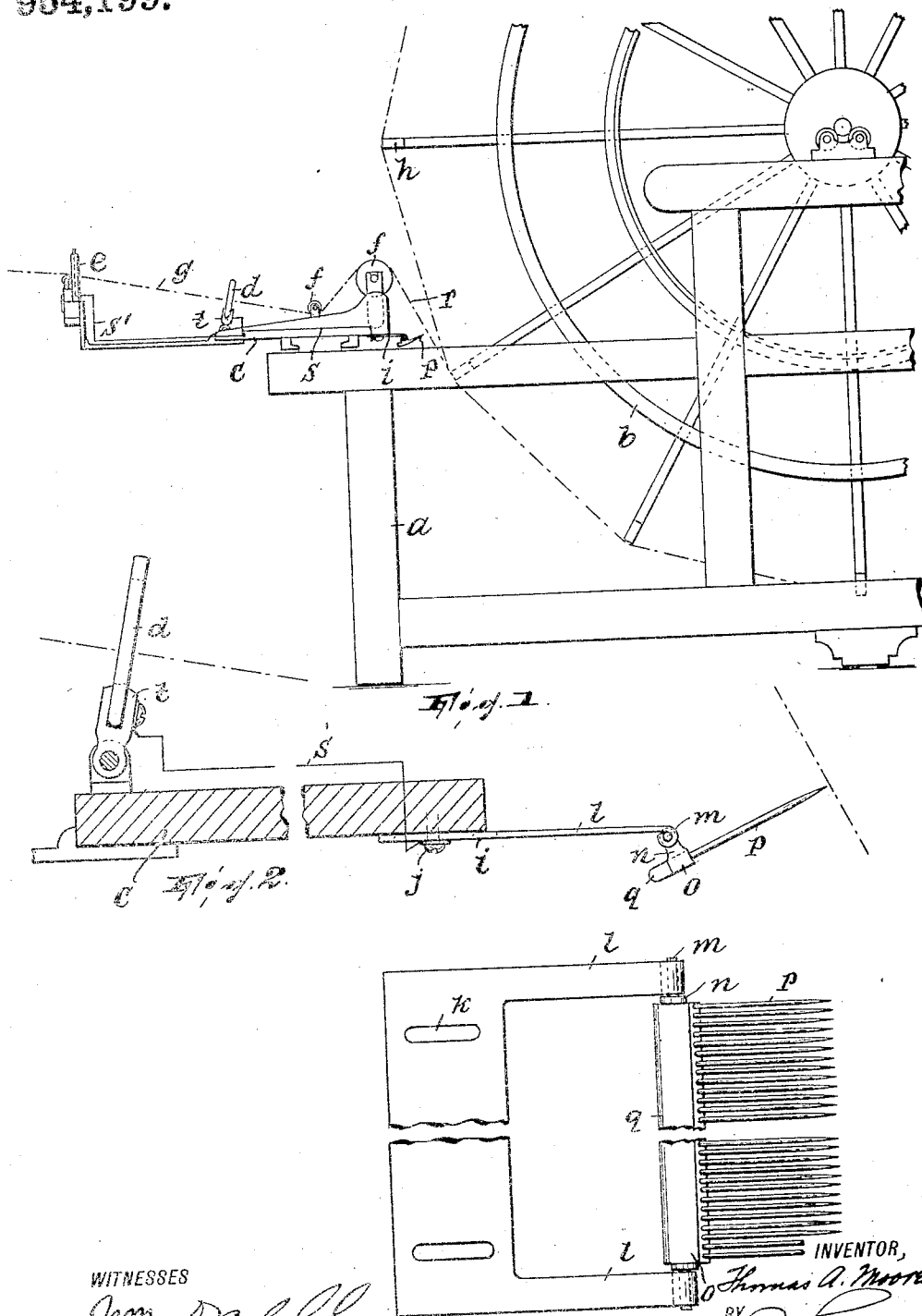


T. A. MOORE.
 WARPING MACHINE ATTACHMENT.
 APPLICATION FILED APR. 23, 1909.

Patented Apr. 5, 1910.

954,199.



WITNESSES

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Fig. 3.

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WARPIING-MACHINE ATTACHMENT.

954,199.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, THOMAS A. MOORE, a citizen of the United States, residing in Clifton, Passaic county, New Jersey, have invented a certain new and useful Improvement in Warping-Machine Attachments; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

It is well known that when certain materials—silk, for instance—are manipulated in such a way as to produce friction, difficulty in handling the same according to the predetermined purpose is met with in the form of disturbances arising out of static electricity. For instance, in the operation of warping silk, it is known that the friction of the silk due to rubbing contact with parts of the apparatus causes the silk to “fly”, *i. e.*, each thread or filament to repel its neighbor, so that the silk not only spreads itself unduly; making the sections or bands of warp of irregular or unintended width, but piles unevenly in the successive windings on the reel. The exciting medium in the case just referred to is the reed or reeds of the warping machine, and I have discovered that if an electrical conductor is extended from such part of the apparatus to the point where the electrical disturbance manifests itself such disturbance will be eliminated; in other words, by providing such a conductor the repelling tendency is neutralized. So far as I am able to see, this is due to the fact that, since the tendency of the threads to repel each other is *nil* at or adjacent their point of contact with the exciting medium, by employing an electrical conductor I extend the same effect to the point where disturbance, due to the repelling action, would otherwise exist.

In carrying my invention into practice I employ as the part of the conducting means which adjoins the field of disturbance a multipointed metallic device which, in so far as its use in connection with a warping or the like machine is concerned, is adapted to yield to mechanical displacement by the material being wound on the reel in the direction of the length thereof.

I have illustrated my invention in connec-

tion with a warping mill, Figure 1 being a side view of such an apparatus, showing my improvement attached thereto; Fig. 2 is a vertical sectional view of the carriage of the machine showing one of the reeds and my improvements in side elevation; Fig. 3 is a plan view of the attachment forming my improvement.

In the drawings, *a* designates the frame of a warping machine, *b* its reel, *c* its carriage, *d* and *e* the usual reeds and *f* the usual rollers arranged on the carriage. The silk *g* or other material being warped extends through the reeds, under one roller *f*, over the other roller *f* and around the reel *b*, resting on the slats *h* of the latter.

In practice it is found that the existence of static electricity in the material *g*, caused by its contact, while moving, with the reeds *d* and *e*, and particularly with the reed *d*, causes the threads to “fly,” as above stated, that is, to repel each other; this phenomenon manifests itself in a portion of the material between the reel and the nearer roller *f*, so that instead of the material being laid on the reel in bands or sections of constant or intended width, it is caused to be laid on the reel in irregular or unintended disposition, the warp sections being too wide in places or piled irregularly. As above stated, in order to overcome this I provide an electrical conductor which extends from the exciting medium, in the present instance the reed or reeds, to the point where the electrical disturbance manifests itself, to wit, in proximity to the portion of the material *g* disposed between the reel and the nearer roller *f*. To this end *i* is a metallic plate which may be suitably secured, as by screws *j*, to the carriage *c*, the screws preferably penetrating slots *k* so that the plate, which stands horizontally, may be adjusted toward and from the reel. The plate *i* has arms *l* projecting toward the reel and in the ends of these are journaled trunnions *m* on upwardly projecting arms *n* of a bar *o*. The rear portion of the bar *o* extends back of the arms *n* and in its front portion are mounted a number of parallel pins *p* preferably having pointed ends. The rear part *q* of the bar *o* forms a counterweight for the pins so that the normal position of the comb formed by the bar and pins is in a plane forming a right angle with a tangent of the reel. The comb being pivoted it will yield should any of the material catch upon its points, which extend

into as close proximity as possible to the portion *r* of the material disposed between the reel and the nearer roller *f*; the comb of course yields in both directions, so as to accommodate itself to backward as well as forward rotation of the reel.

It will be understood that the comb is metallic as well as plate *i*. From one of the screws *j* extends a wire or other metallic conductor *s* which is attached to the metal holder *t* in which the reed *d*, (also of metal) is mounted; as shown in Fig. 1, at *s'*, this conductor is electrically connected also with the reed *e*.

When an attachment of the nature of that above described is applied to a warping machine or the like, it will be found that the disturbances due to the existence of static electricity in the material are entirely overcome. For instance, in the operation of warping, instead of the sections or bands of warp being laid on the reel irregularly (for instance, in such a way that a cross-section of any pile would reveal a more or less triangular form), the material is laid on the reel uniformly and in regular and intended widths, so that a cross-section of any band or section of warp on the reel would simulate a rectangle.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. The combination, with means for operating upon the material comprising a part as between which and the material there is relative movement, of a conducting means leading from said part into proximity to the point where static electricity set up in the material by said part manifests itself, the portion of said means proximating the material being a metallic comb, substantially as described.

2. The combination, with means for operating upon the material comprising a part as between which and the material there is relative movement, of a conducting means leading from said part into proximity to the point where static electricity set up in

the material by said part manifests itself, the portion of said means proximating the material being a metallic comb yieldable in the direction of relative movement as between the material and said part, substantially as described.

3. The combination, with means for drawing threads lengthwise and a part with which the threads have contact, of a conducting means leading from said part into proximity to the threads at a point between the first means and said part, substantially as described.

4. The combination, with means for drawing threads lengthwise and a part with which the threads have contact, of a conducting means leading from said part into proximity to the threads at a point between the first means and said part, the portion of the conducting means proximating the material being a metallic comb, substantially as described.

5. The combination, with means for drawing threads lengthwise and a part with which the threads have contact, of a conducting means leading from said part into proximity to the threads at a point between the first means and said part, the portion of the conducting means proximating the material being a metallic comb yieldable in the direction of movement of the threads, substantially as described.

6. The combination of a suitable supporting means, a part journaled therein on which to wind the material, a part with which the material has contact while being advanced to the rotating part, a metallic comb projecting into proximity to the rotating part, and means for electrically connecting the comb with the second named part, substantially as described.

In testimony, that I claim the foregoing I have hereunto set my hand 22nd day of April, 1909.

THOMAS A. MOORE.

Witnesses:

JOHN W. STEWARD,
WM. D. BELL.