

(No Model.)

2 Sheets—Sheet 1.

W. C. MACKINNEY.
TEXTILE STRETCHING DEVICE.

No. 550,394.

Patented Nov. 26, 1895.

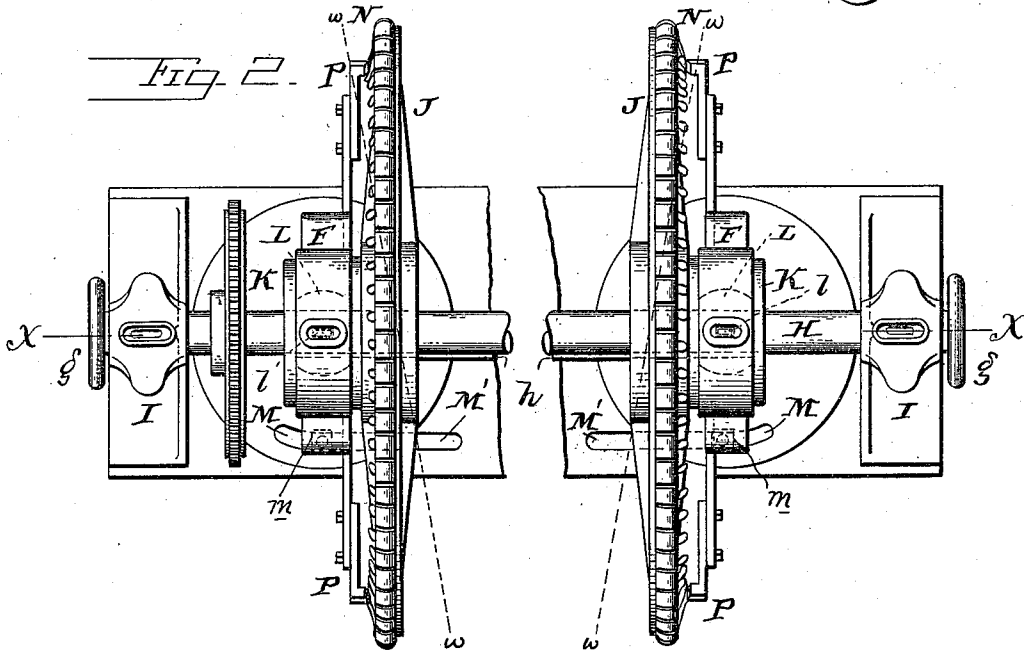
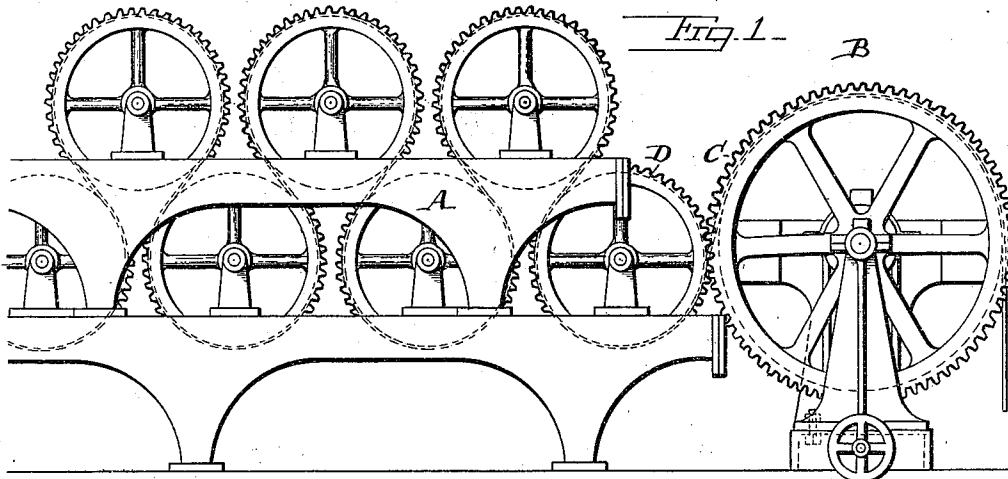
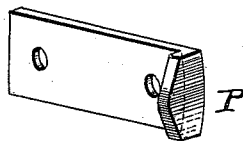


Fig. 2.



Witnesses:

Jesse B. Heller.
Attorney.

Inventor.

William C. Mackinney

By *[Signature]*
Attorney.

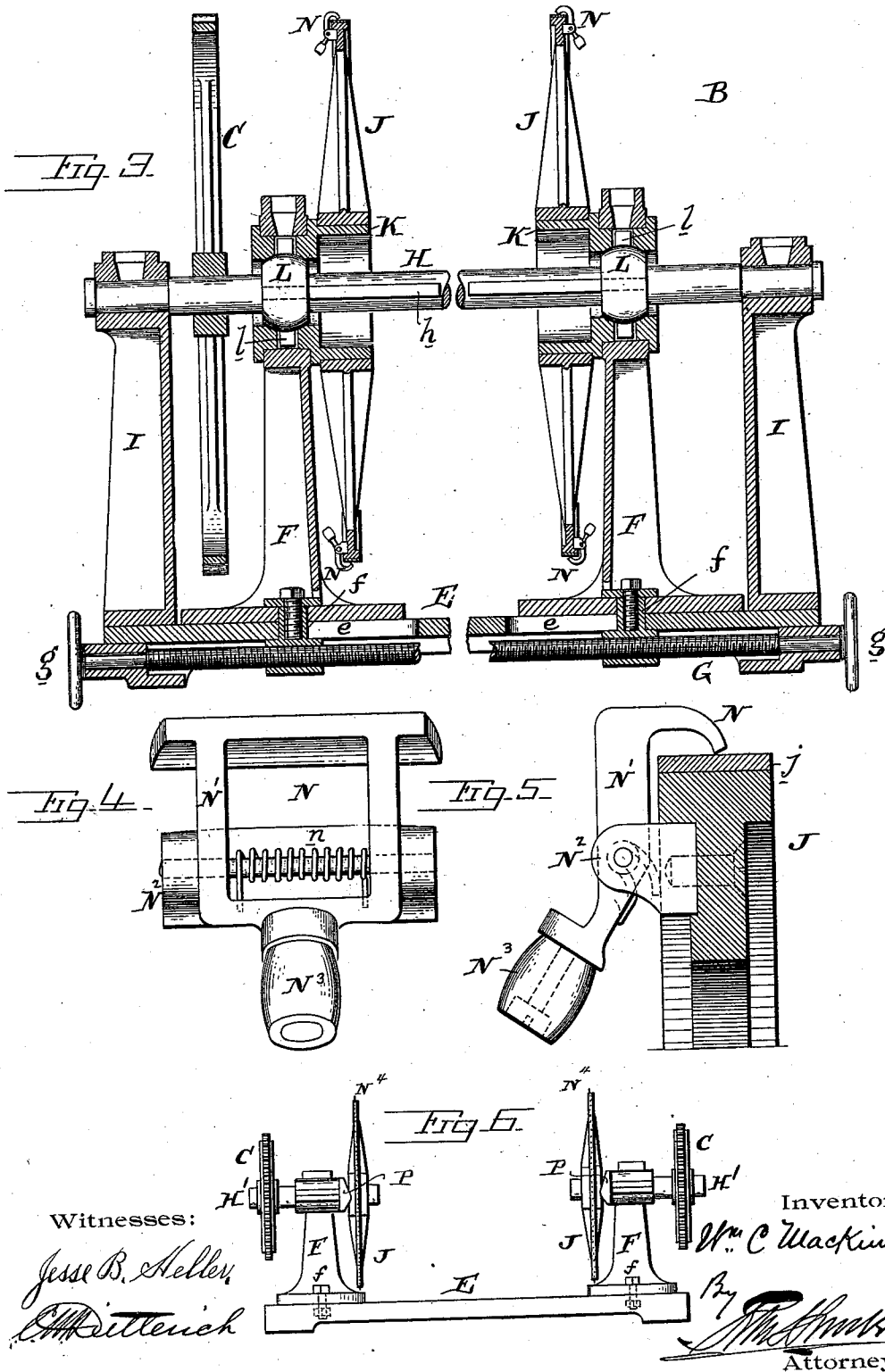
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2 Sheets—Sheet 2.

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TEXTILE STRETCHING DEVICE.

No. 550,394.

Patented Nov. 26, 1895.



Witnesses:

Jesse B. Heller,
C. R. Rittenbach

Inventor.

W. C. Mackinney
By *[Signature]*
Attorney.

UNITED STATES PATENT OFFICE.

WILLIAM C. MACKINNEY, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO
THE H. W. BUTTERWORTH & SONS COMPANY, OF PENNSYLVANIA.

TEXTILE-STRETCHING DEVICE.

SPECIFICATION forming part of Letters Patent No. 550,394, dated November 26, 1895.

Application filed September 20, 1893. Serial No. 485,963. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM C. MACKINNEY, of the city and county of Philadelphia and State of Pennsylvania, have invented an
5 Improvement in Textile-Stretching Devices, of which the following is a specification.

My invention has reference to textile-stretching devices; and it consists of certain improvements which are fully set forth in
10 the following specification and shown in the accompanying drawings, which form a part thereof.

This improvement is especially designed for textile machinery wherein it becomes necessary to bring the fabric to a given width prior
15 to being placed upon the market. Fabrics after leaving the loom and being subjected to bleaching, washing, drying, printing, or other operations for finishing frequently change
20 the width by shrinkages and otherwise, so that it is not of the same width throughout the entire length and in many places falling within the width required by the manufacturer and the trade.

The object of my invention is to produce a machine which shall have the capacity for stretching fabrics so as to bring them to a regular and proper width prior to being packed
30 ready for shipment, so that the width of the fabric throughout its entire length is substantially uniform.

My improved machine is particularly adapted to combination with drying-machines, calenders, and other finishing-machines, so that
35 the fabric is stretched while in the moist or dampened condition just prior to being run upon the drying-cylinders or other machines whereby it is properly dried and finished at the requisite width, and after which it will
40 retain the said width.

In carrying out my improvement I provide two wheels, drums, or supports provided on their periphery with suitable clamps or means
45 to hold the edges of the fabric, which wheels, drums, or supports may be set at a slight angle to each other, the said clamps or other devices being adapted to clamp or hold the edges of the fabric to the peripheries of the drums, wheels, or supports, and while they are
50 turning cause the said fabric to be stretched. The wheels, drums, or supports are carried

in suitable bearings which will permit of their adjustment and they are driven at the same speed, which speed shall also be commensurate with that of the drying-cylinders or other
55 receiving apparatus which takes the textile material from the stretchers.

In my preferred construction of apparatus I provide the wheels or drums with suitable adjusting devices whereby they may be set
60 at various angles and at various widths apart to suit different widths of fabric and also different degrees of stretching which may be required.

The essential feature of my invention consists in providing revolving surfaces with a series of adjacent clamps or devices which
65 shall hold the fabric firmly to the revolving surfaces while said clamps or devices of the two surfaces gradually recede from each other. The clamps are preferably opened
70 and closed automatically, so as to receive and clamp the fabric at the proper instant and also to release it at the proper time.

My invention will be better understood by
75 reference to the accompanying drawings, in which—

Figure 1 is a side elevation showing a drying-machine combined with my improved stretching devices. Fig. 2 is a plan view of
80 my improved stretching device. Fig. 3 is a sectional elevation of same on line *x x*, Fig. 2. Fig. 4 is an elevation of one of the clamps. Fig. 5 is an enlarged view of a portion of the periphery of one of the stretching-wheels of
85 Fig. 3, showing a construction of the clamps. Fig. 6 is an elevation of a modification of my invention, and Fig. 7 is a perspective view of one of the cams or openers for operating the
90 clamps.

A represents a drier of any suitable construction and usually consisting of a series of heated drums, over which the fabric is required to pass and by which it is dried. These
95 drums are usually geared together by gears D.

B represents my improved stretching device and is driven preferably by gear C, meshing with one of the gears D of the drier. It may be driven by any other suitable devices; but its speed must be commensurate
100 with that of the apparatus which receives the fabric from the stretching device.

Referring more specifically to Figs. 2 to 5, E represents a base-plate, upon which are mounted two standards I, in which a shaft H is journaled.

5 F F are two pedestals pivoted at *f* in slots *e* to bearings adjustable in the base-plate. These pedestals may thus be adjusted about their pivots *f* to change their angles, and also adapted to be moved to or from each other to
10 vary their distance apart, the latter movement being accomplished by the shaft G, having right and left hand screw-threads engaging with the pivoted bearings *f* and adapted to be operated by hand-wheels *g*. In place
15 of these devices any other suitable mechanism may be employed. After adjusting the pedestals F F to the requisite distance apart they may be fixed in the proper angles by means of clamping-bolts *m*, passing through
20 curved slots M in the pedestal and rectangular slots M' in the base-plate. (Best shown in Fig. 2.)

Journalled in the pedestals F F are bearings K, and to these bearings are secured in
25 any suitable manner the stretching wheels, drums, or supports J. The bearings K are tubular in form, and the shaft H passes freely through them. Upon the shaft H and adapted to slide through, but positively rotated there-
30 with by means of the key or feather *h*, are hubs L, which are provided with radial pins or projections *l*, fitting into oblong holes in the bearings K. In this manner any adjust-
35 ment of the pedestals F F toward or from each other causes the hubs L to be moved with the bearings K and wheels or supports J. The bearings and the wheels or supports J J may be adjusted at an angle with the
40 shaft H and at the same time maintain a positive connection to insure the rotation of said bearings with their wheels or supports by the shaft. The dotted lines *w w* in Fig. 2 indi-
45 cate the nature of this angular adjustment; but it is exaggerated greatly in the said dotted lines to more clearly indicate the object. In practice but a small adjustment is necessary, as the diameter of the wheels J J will insure a
50 decided stretching operation with but very slight angular adjustment of the pedestals F F. The gear-wheel C, before referred to as
connecting with the gearing D of the drying apparatus, is secured to the shaft H. In Fig. 3 this gear-wheel is shown similar to Fig. 1,
55 while in Fig. 2 it is shown simply in the form that might be termed a "sprocket-wheel," so that a sprocket-chain could be employed to drive the shaft H at the requisite speed by a connection with any suitable power device. The means for imparting motion to the shaft
60 are unimportant and may be varied.

N represents a series of clamps arranged about the periphery of the wheels or supports J J, which clamps are adapted to engage a brass rim *j*, as is clearly shown in Fig. 5.
65 Each of these clamps consists of a pivoted part N', pivoted to a stationary part N², secured to one of the wheels J and is provided

with a wheel or roller N³ for operating it. A spring *n* is employed to hold the clamp or nipper N' down upon the surface *j* with sufficient
70 force to retain the fabric during the stretching operation.

It will be observed by examining Fig. 5 that the clamping edge of the movable part or nipper N' where it comes in contact with
75 the plate *j* is to the right of the pivot fulcrum-point of the said nipper, so that as the fabric pulls to the right it will tend to cause the nipper or clamp to hold it more tightly, thus preventing any possibility of the fabric
80 slipping from under the nipper or clamp.

Secured to each side of the pedestals F are cams P, which are adapted to act upon the rollers N³ in such a manner as to open them
85 at a given point to permit the insertion of the edge of the fabric, then to release them for a given portion of a revolution of the wheels J during the stretching operation, and then to open them again automatically to permit the
90 fabric to be released, so that it may pass on to the drying-cylinders or other machines.

In practice it is advisable that the feeding of the fabric into the nippers or clamps shall be done by hand, as the irregularity in the
95 width requires some adjustment on the part of the operator.

It will be observed that if the wheels J are set at a slight angle the moist or dampened fabric may be placed within the clamps in a
100 loose condition, and as the said wheels rotate the said fabric will be stretched to its maximum width and then released and properly delivered, under which conditions there is little or no liability of further shrinkage or
105 reduction in width.

It will be understood that the operation of feeding the fabric, stretching it, and delivering it is continuous.

In the modification shown in Fig. 6 each of the stretching wheels, cylinders, or supports
110 J is directly secured upon a short shaft H', carried in the pedestal F, the said shaft corresponding to an expansion of the bearing K. Each of the said shafts is provided with a
115 driving-gear or sprocket-wheel C. In this manner the wheels J may be adjusted to different angles, as required in the construction before described, and the shaft H and bearings I are dispensed with. The adjustment
120 to and from each other of the wheels or supports J J may be accomplished in this modification in the same manner as in Figs. 2 and 3. The wheels or supports J J may be driven at the same or varying or at different speeds,
125 as required.

In Fig. 6 I have shown the peripheries of the wheels or supports J provided with pins N⁴ to be used in place of the clamps N, (shown
130 in Fig. 3,) upon which pins the edges of the fabric are placed. In this case the cams P are not necessary. These pins constitute devices for holding the edges of the fabric while being stretched.

I do not confine myself to any particular

means of supporting the wheels or parts J J to cause them to rotate at an angle to each other; nor do I confine myself to any special form of clamps or nippers or means for holding the edges of the fabric to the wheels or moving parts, nor to any particular devices for adjusting the wheels to and from each other, as all of these details may be greatly modified without departing from the principle of my invention.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a textile fabric stretching machine, the combination of two adjustable standards having journal bearings, two wheels or cylinders journaled in said standards and having their peripheries provided with a series of fabric holding devices, a rotating power shaft journaled in fixed bearings and extending through the two wheels and journal bearings of the standards, a base for supporting the said fixed bearings, and adjustable connections between the power shaft and wheels or cylinders supporting the fabric holding devices, whereby the latter may be driven from the power shaft and be maintained at an angle to each other.

2. In a textile fabric stretching machine, the combination of two adjustable standards having journal bearings, two wheels or cylinders journaled in said standards and having their peripheries provided with a series of fabric holding devices, a rotating power shaft journaled in fixed bearings and extending through the two wheels and journal bearings of the standards, a base for supporting the

said fixed bearings, adjustable connections between the power shaft and wheels or cylinders supporting the fabric holding devices, whereby the latter may be driven from the power shaft and be maintained at an angle to each other, and devices for adjusting the adjustable standards to or from each other.

3. In a textile stretching machine, the combination of two adjustable standards having journal bearings, two wheels journaled in said standards and having their peripheries formed with flat cylindrical surfaces, a rotating power shaft journaled in fixed bearings and extending through the two wheels and journal bearings of the standards, a base for supporting said fixed bearings, adjustable connections between the power shaft and wheels, a series of pivoted fabric clamps each pivoted to the said wheels at a point within the peripheries formed by the flat cylindrical surfaces and having a clamping edge adapted to work in connection with said flat cylindrical surfaces beyond the pivot points, springs to force said clamps down upon the fabric, and cam devices to open said clamps at stated intervals, the construction of the said clamp being such that pulling upon the fabric in the stretching operation tends to move the clamping edge along the cylindrical surface and increase the holding or biting action.

In testimony of which invention I have hereunto set my hand.

WM. C. MACKINNEY.

Witnesses:

ERNEST HOWARD HUNTER,
H. L. MOTHERWELL.