(No Model.) 2 Sheets—Sheet 1.

J. E. WINDLE.

CLOTH STRETCHING MACHINE.

No. 459,235. Patented Sept. 8, 1891.

Fig: 1

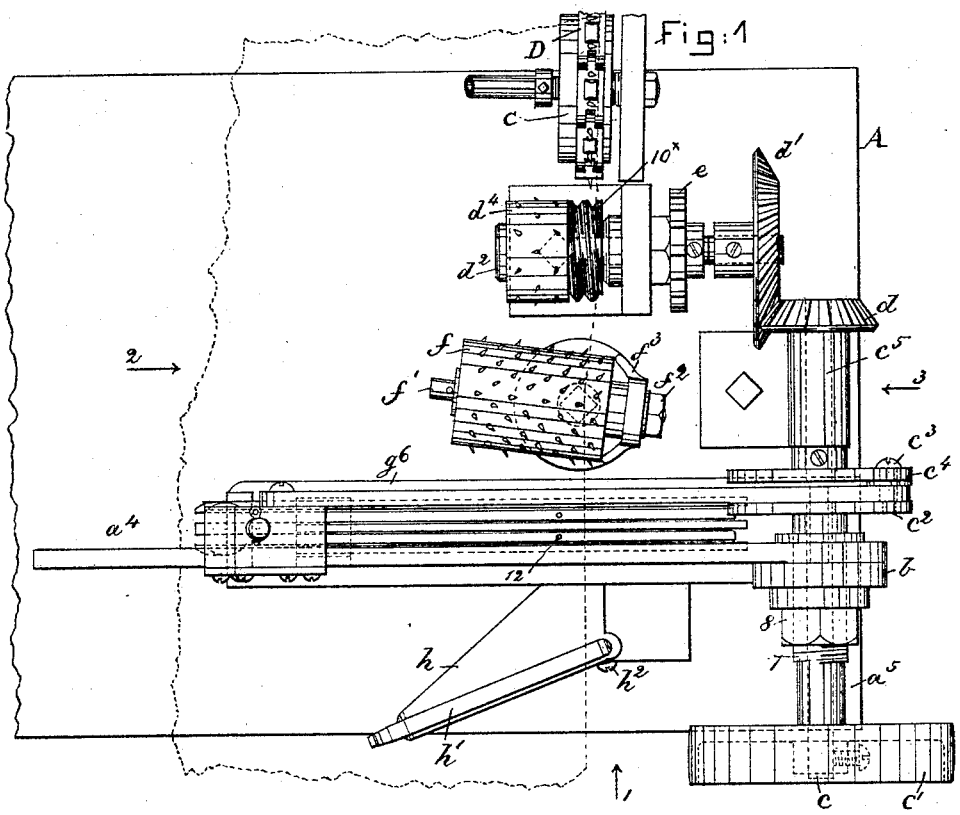
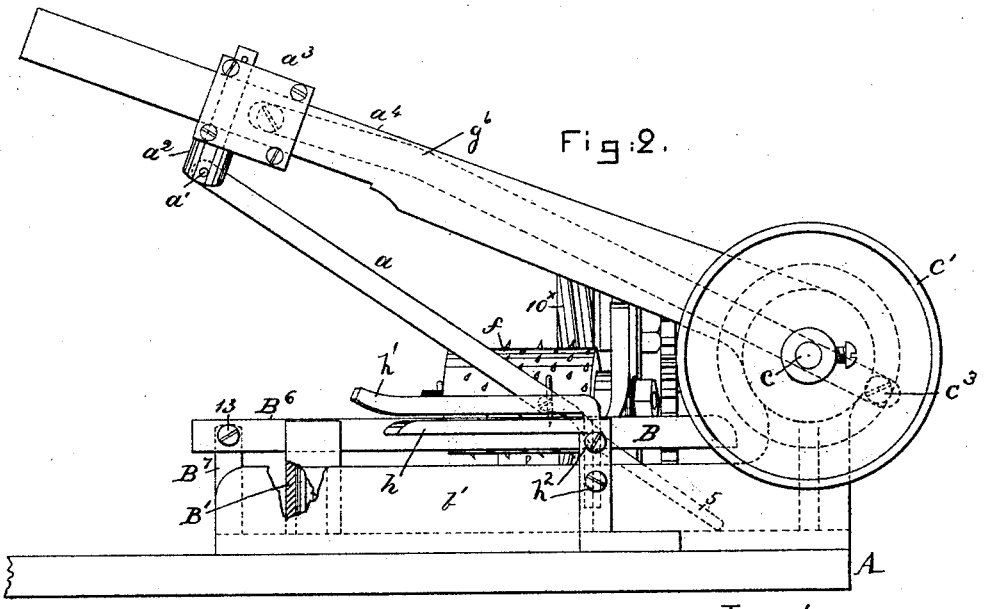


Fig: 2.



Witnesses.
Fred. S. Grumbof
Frederick L. Emery

Inventor.
John E. Windle,
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(No Model.)

2 Sheets—Sheet 2.

J. E. WINDLE.

CLOTH STRETCHING MACHINE.

No. 459,235. Patented Sept. 8, 1891.

Fig: 3.

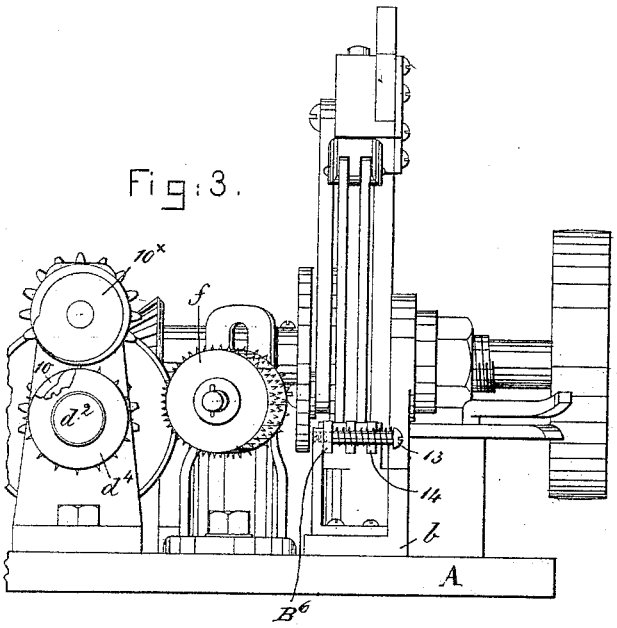
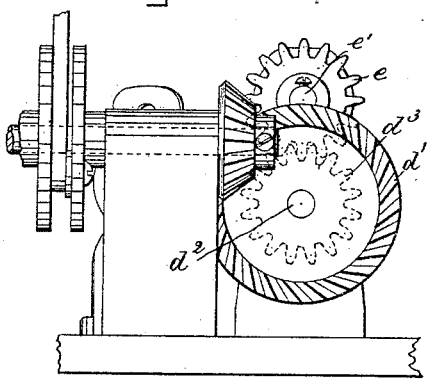


Fig: 4.



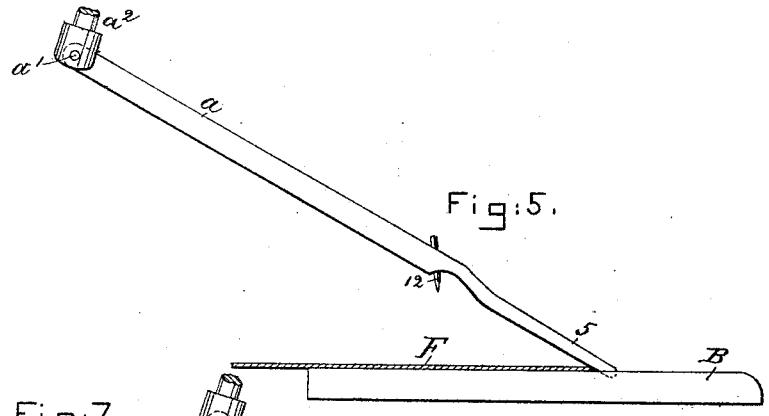
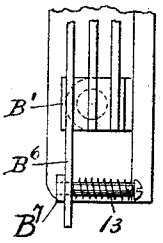


Fig: 5.

Fig: 7.



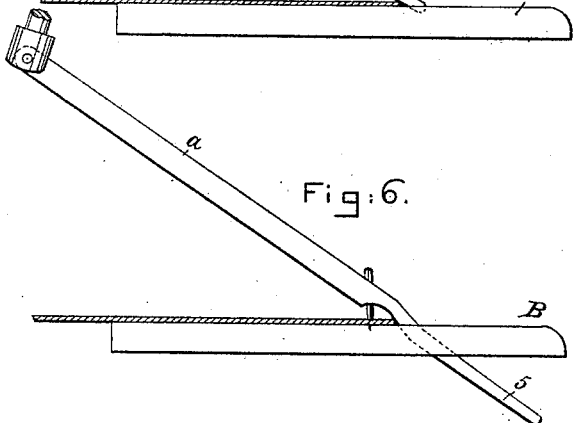


Fig: 6.

Witnesses.

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UNITED STATES PATENT OFFICE.

JOHN E. WINDLE, OF NORTH GRAFTON, MASSACHUSETTS.

CLOTH-STRETCHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 459,235, dated September 8, 1891.

Application filed August 21, 1890. Serial No. 362,602. (No model.)

To all whom it may concern:

Be it known that I, JOHN E. WINDLE, of North Grafton, county of Worcester, State of Massachusetts, have invented an Improvement in Cloth-Stretching Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

This invention has for its object to stretch cloth or fabric more especially on its way to the usual tenter-hooks of cloth stretching or tentering machines, the said hooks being carried by chain-links or in other usual manner.

The apparatus employed by me comprises several elements, among which is an uncurling-finger, which occupies a position diagonal to the trail of the cloth, and a toothed gravitating stretching pawl or pawls mounted, preferably, in such manner as also to be moved in the direction of the feed of the cloth while in engagement therewith, and a toothed surface and worm-toothed stretching-rolls.

Woolen cloth in its preparation for market has to be washed, dyed, and fulled, and to facilitate this operation the ends of the web are sewed together and the web is fed between squeezing-rolls, fulling-rolls, &c., such operations tending to curl or make the selvage edges irregular, and these edges have to be uncurled and the cloth has to be partially stretched to put it properly on the tenter-hooks of one or another form of tentering or cloth-stretching machine, which finally stretches the web widthwise.

In this present instance I have chosen to embody my invention in connection with a tentering-machine such as shown in United States Patent No. 295,155.

Figure 1 in plan view represents my invention as applied to one side only of the class of machine shown in said patent, the dotted lines showing the edge of a piece of cloth. Fig. 2 is an end elevation looking in the direction of the arrow 1, Fig. 1; Fig. 3, an elevation looking at it in the direction of the arrow 2, Fig. 1, the tenter-chain being omitted; Fig. 4, a partial elevation in the direction of the arrow 3, Fig. 1. Figs. 5 and 6 are different views of one of the stretching-pawls and cloth-supporting grid. Fig. 7 is a top view of the grid.

It will be understood that the parts shown in the drawings will be duplicated at opposite sides of the machine.

The frame-work A, which may be of suitable shape to support the working parts, has suitable bearings for the various shafts and moving devices.

The chain D, composed of blocks jointed together and having pins upon which may be impaled the edge of the fabric to be stretched, and the sprocket-wheel C for carrying it are and may be all as in the said Patent No. 295,155, to which reference may be had; or instead of the said chain I may employ any other usual form of cloth-stretching tenter adapted to have the edge of the cloth applied to its pins and thereafter stretch or hold the cloth stretched to be dried.

The frame-work has pivoted upon it by a pivot B′ a grid B, composed of several bars, (see Fig. 7,) preferably substantially parallel each to the other, with a space between for the passage of the lower ends 5 of the gravitating cloth-stretching pawls a, pivoted at a' on a pivoted stud a^2 on a carriage a^3, mounted and free to be reciprocated upon a track a^4, the lower end of which is shaped and bored to leave a sleeve-like hub a^5, which is extended through an upright b or bar rising from a portion b', secured to or forming part of the frame-work. The sleeve a^5 is threaded, as at 7, (see Fig. 1,) and receives upon it the nut 8, which is turned up against the bearing b, so as to clamp the track in any angular position desired.

The sleeve a^5 forms a long bearing for the shaft c, upon which is secured the driving-pulley c', which is driven in any usual manner. This shaft has a crank c^2, which is connected by a crank-pin c^3 to a like crank c^4, attached to a shaft c^5 in the same line with the shaft c, the said shafts and cranks forming one shaft.

The shaft c^5 has a bevel-pinion d, which engages a bevel-pinion d' on a shaft d^2, having secured to it not only a pinion d^3, but a worm-gear 10, (partially shown in Fig. 3,) and loose on the end of the said shaft d^2 is a cloth-holding roll d^4, which may be made of wood and provided with usual temple-teeth or pin-points. The pinion d^3 engages a pinion e, fast on a shaft e', directly above and parallel

to the shaft d^2, the shaft e' also having fast upon it a worm-toothed wheel $10^\times$, the worm-toothed wheels 10 and $10^\times$ being alike, the shape of the teeth being shown in Fig. 1, where the wheel $10^\times$ is shown in plan view.

Between the worm-toothed wheels, which in their rotation act to smooth or scrape the cloth from toward its center line to its selvage edge, while the holding-roller d^4 engages the body of the cloth, I have located a selvage-holding roll f, it being, preferably, a cylinder of wood having needle-pointed teeth, the cylinder being free to rotate on a horizontal stud f', adjustably held by a nut f^2 in an upright or stand f^3, forming part of the frame-work.

Each stretching-pawl has a point or prong 12 to engage the cloth F, lying upon the grid B, when the said pawl is moved from the position Fig. 5 to that shown in Fig. 6, further movement of the pawl in the direction indicated by the said two figures stretching the cloth and passing it under the roll f, which retains the cloth substantially in its stretched position, the selvage passing beyond the roll f between the worm-toothed wheels 10 and $10^\times$, where the selvage of the cloth is acted upon and scraped, so as to take out from it any curls or wrinkles preparatory to the said selvage being impaled upon the usual pins of the chain D, before referred to.

The pivoted grid has an extension B^6, (see Figs. 2, 3, and 7,) through which is extended loosely a screw 13, the said screw being turned into an upright B^7, a spiral spring 14 surrounding the said screw between its head and the extension B^6.

It will be understood that the cloth being stretched is made to travel continuously, or substantially so, through the machine, and while the points 12 are in engagement with the cloth and the ends of the pawls 5 are between the plates forming the grid the said grid must turn about its pivot B′ in the direction of the travel of the cloth, and at this time the spring 14 yields; but as soon as the pawls a are lifted or drawn back so that the prongs 12 retire from the cloth, then the spring restores the grid to its normal position.

The carriage a^3 referred to has jointed to it a link g^6, which embraces the crank-pin c^3, before referred to, the rotation of the shaft c causing the carriage to be reciprocated.

At one side of the stand b' and the grid I have provided the frame-work with a cloth-support h, (shown best in Figs. 1 and 2,) and immediately over it and at a short distance therefrom is an adjustable finger h', placed to occupy a position diagonal to the travel of the cloth, the finger being held in adjusted position by suitable set-screws h^2. One edge of the cloth to be stretched is passed between the support h and the finger h', then over the grid, and its end laid under the roll f, and the machine is started, the finger acting in a preliminary manner to smooth out the curls and wrinkles in the edge of the cloth, and thereafter the edge first caught by the gravitating pawls and further stretched and passed under the roll f, and from thence the edge is passed between the worm-wheels, which yet further wipe and manipulate and stretch and smooth the edge of the cloth before it goes upon the tenter-chains.

This invention is not limited to the employment of all the devices shown, as excellent results may be gained by the omission of the parts h, h', and f, and in some instances cloth may be passed directly from the grid to the tenter-chains or to the roll f and the latter roll deliver the cloth to the tenter-chains.

While the worm-gears 10 and $10^\times$ act upon the edge of the cloth the needle-pointed teeth of the loose roll d^4 hold the cloth a little back from its edge and prevent it from moving laterally under the action of the wheels 10 $10^\times$.

This invention is not limited to the particular pitch of the teeth of the worm-gears.

I claim—

1. In a cloth-stretching machine, the grid, the track, the carriage, means for reciprocating the carriage on the track, and the gravitating pawls attached to the carriage and provided with pins or points to engage the cloth near its edge and stretch the same laterally, substantially as described.

2. The stand b', the grid pivoted at or near one end, and the track, combined with the gravitating pawls having pins or points to engage the cloth near its edge, and with means to reciprocate the said pawls transversely to the direction of the feed of the cloth, the grid and pawls being free to be moved with the cloth in the direction of the feed of the same while the pins or points of the pawls are in engagement with the cloth, substantially as described.

3. The grid and the gravitating pawls having pins or points to engage the cloth near its edge and means to actuate the said pawls, combined with the support h and the diagonally-placed finger h' to bear upon the cloth near its edge preparatory to the action of the pawls upon the cloth, substantially as described.

4. The grid and the gravitating pawls having pins or points to engage the cloth near its edge and means to actuate the said pawls, combined with the toothed roll f, to operate substantially as described.

5. The grid and the gravitating pawls having pins or points to engage the cloth near its edge and means to actuate the said pawls, combined with the toothed wheels above and below the cloth to wipe across the edges of the same to smooth out the wrinkles therein, substantially as described.

6. The grid and the gravitating pawls having pins or points to engage the cloth near its edge and means to actuate the said pawls, combined with the worm-toothed wheels above

and below the cloth to wipe across the edges of the same to smooth out the wrinkles therein and with a toothed roll to hold the cloth while the said worm-toothed wheels act upon it, substantially as described.

7. A cloth-stretching machine containing the following instrumentalities, viz: a grid, gravitating pawls having pins or points to enter the cloth near its edge and stretch the same, and means to actuate the said pawls, combined with a tentering chain to operate substantially as described.

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

JOHN E. WINDLE.

Witnesses:
GEO. W. GREGORY,
EDITH F. GUILD.