

I. E. PALMER.

Machine for Tentering and Straightening Fabrics.
No. 161,896. Patented April 13, 1875.

Fig. 1.

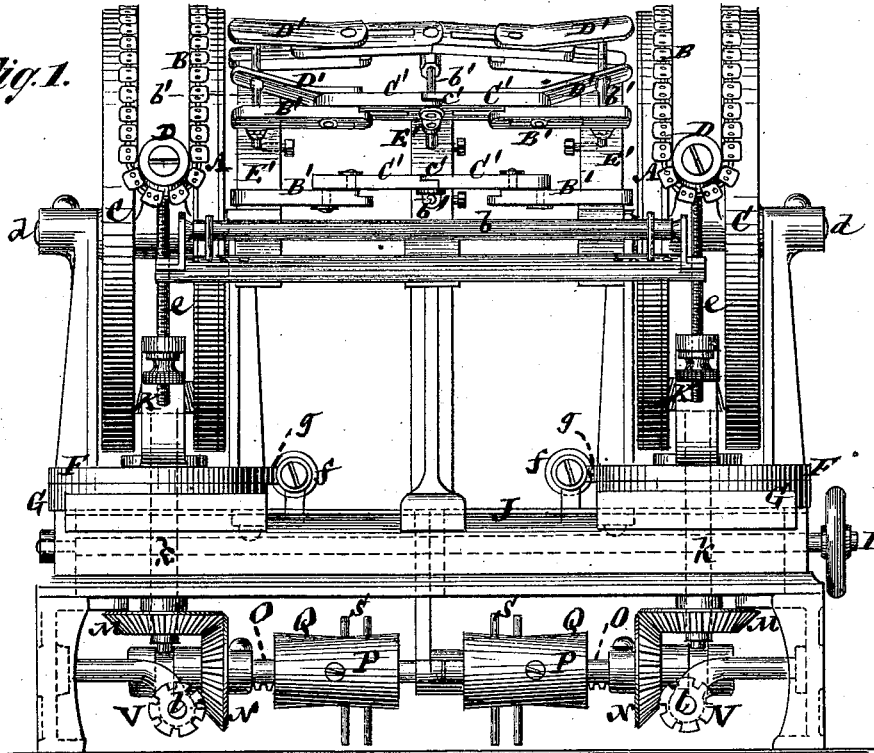
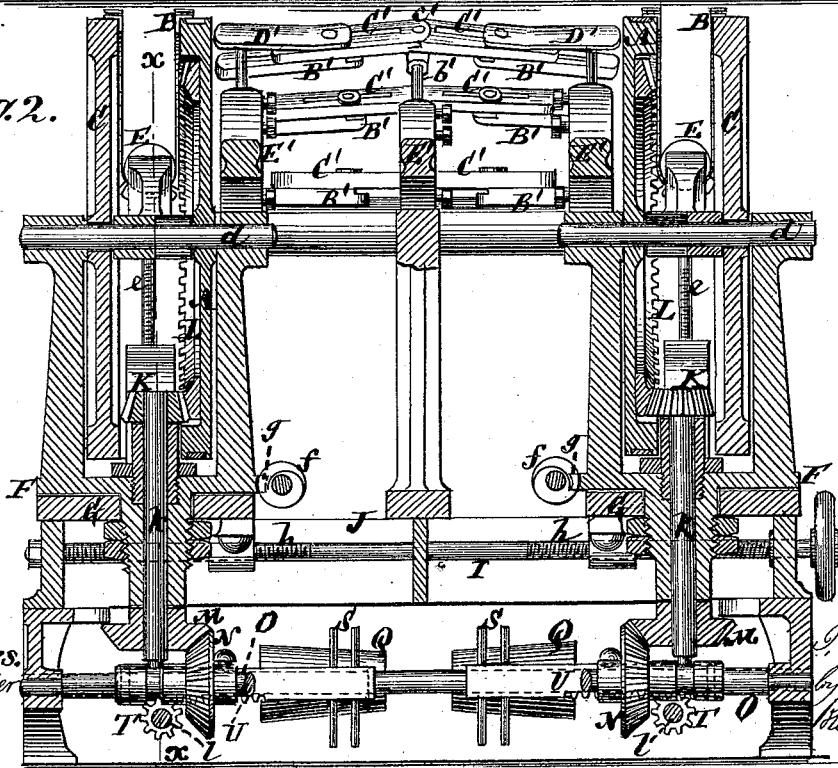


Fig. 2.



Witnesses.
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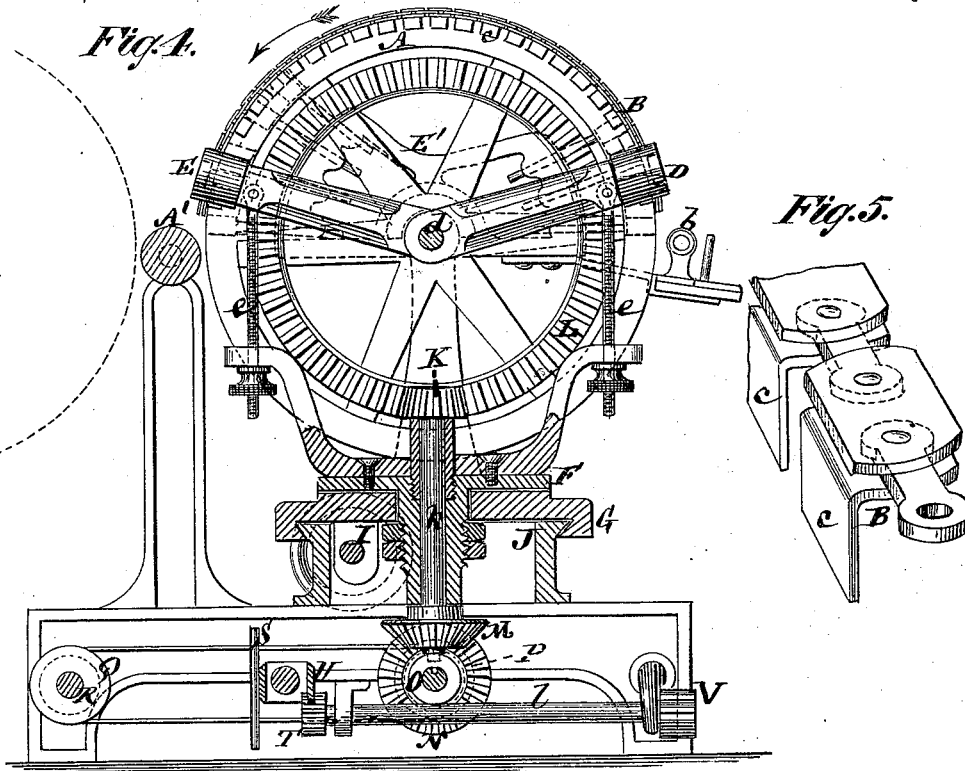


Fig. 5.

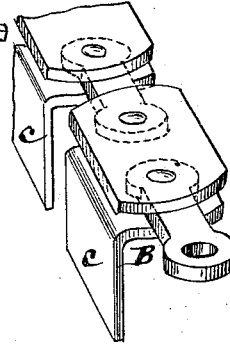
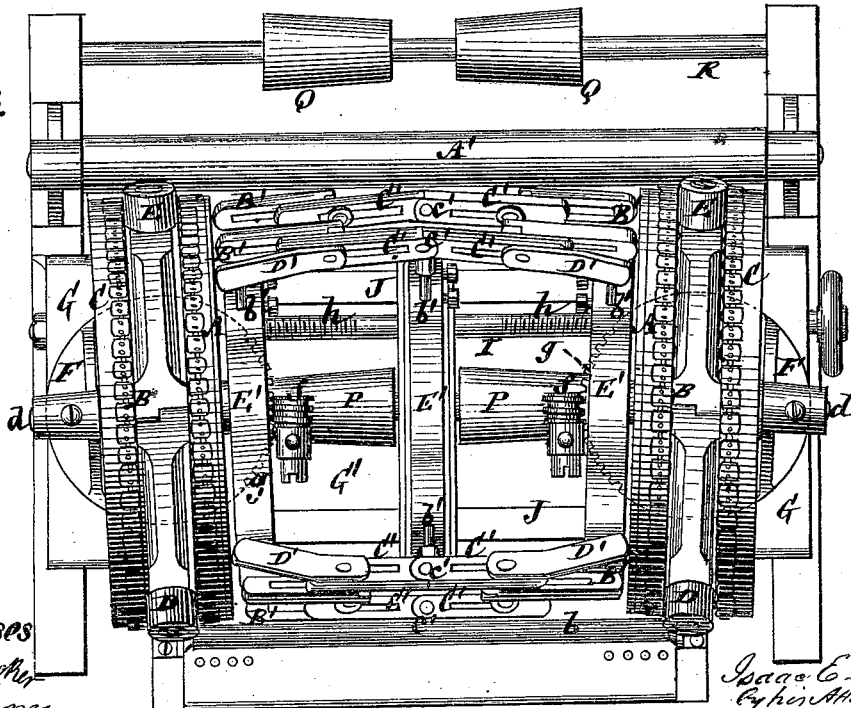


Fig. 3.



Witnesses
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UNITED STATES PATENT OFFICE

ISAAC E. PALMER, OF MIDDLETOWN, CONNECTICUT.

IMPROVEMENT IN MACHINES FOR TENTERING AND STRAIGHTENING FABRICS.

Specification forming part of Letters Patent No. **161,896**, dated April 13, 1875; application filed August 15, 1874.

To all whom it may concern:

Be it known that I, ISAAC E. PALMER, of Middletown, in the county of Middlesex and State of Connecticut, have invented certain Improvements in Machines for Tentering and Straightening Fabrics, of which the following is a specification:

This invention more particularly relates to apparatus for tentering and straightening cloth and other fabrics, in which, as in Letters Patent No. 88,505 and No. 148,082, issued to me March 30, 1869, and March 3, 1874, combinations of adjustable oblique traveling selvage feeding and carrying devices are used, which devices, in some cases, as in my patent of March 3, 1874, operate in connection with endless belts, bands, or cords arranged to hold the selvages of the fabric in between them and the carrying devices, also in which machines the intermediate portion or body of the fabric is run over a divided longitudinally expanding and contracting friction frame or drag arranged between the selvage carrying and stretching devices, as in my patent of March 30, 1869.

This invention, however, essentially differs from these and other machines for a like purpose in several important respects; and consists in a novel combination of endless selvage-holding chains or bands, feeding-wheels, and idlers, whereby said chains or bands have a more free and perfect action. The invention likewise consists in an arrangement of separate selvage carrying, stretching, and feeding devices on opposite sides of the machine, driven in a positive manner, with facility not only for driving said devices on one side of the machine and not on the other, but of positively driving them at different velocities relatively with each other, to adjust the stretch or feed on opposite sides, as required. The invention also consists in a combination, with the selvage carrying and stretching devices, of a roller on the delivery side of the latter at the foot of the chains forming part of said devices, whereby the stretch given to the fabric is better preserved in its passage from the stretching devices to the first drying-cylinder. The invention likewise consists in various novel combinations of devices connected with the obliquely-arranged selvage carrying and

stretching devices, for changing their obliquity, as required, for driving the same, and for checking or controlling the one set of such devices on the one side of the machine relatively to the other set of said devices on the other side of the machine. Furthermore, the invention consists in a friction stretching frame or drag, constructed so as not only to be capable of expansion and contraction breadthwise of the web, but also, if necessary, of being more or less bowed in or out radially relatively to the axes of the traveling selvage-carriers, whereby more perfect provision is made for regulating the stretch of the fabric between the selvages.

In the accompanying drawing, Figure 1 is a front elevation of a machine constructed in accordance with my invention. Fig. 2 is a central vertical section in a direction transverse to the feed; Fig. 3, a plan, and Fig. 4 a vertical section on the line *x x*. Fig. 5 is a view, in perspective, of a section of either selvage-holding chain.

A A are the diverging or obliquely-arranged selvage-carrying wheels on opposite sides or ends of the machine, and onto and between which and endless chains B B, moving in common with the wheels, the selvages of the fabric to be tentered are passed. Said fabric is introduced to the machine under a roller or bar, *b*, in front, and so that its selvages pass upwardly to between the selvage-carrying wheels A A, and under the holding-chains B B on the narrowest or most contracted side of said devices, while the body of the fabric passes up over the intermediate stretching frame or drag.

The selvage-holding chains B B may be variously constructed, but they are here shown (see Fig. 5) as composed of duplicate upper and lower disks connected with each other by narrower intermediate links, so that the disks overlap the latter, to give them an elastic hold on the fabric, and the lower range of said disks have a lip or flange, *c*, which serves to guide them in their travel over the carrying-wheels A A in a forward direction, and in their return over loose wheels or idlers C C, the flanges *c* resting against the inner sides of the rolls A C.

By this construction of the chains the tend-

ency of the tension of the fabric to draw the chains toward each other is prevented, as the flanges *c* have a bearing against the outer sides of the rolls A A, and preserve the tension of the fabric.

The idlers C C occupy an outside parallel relation with the carrying-wheels A A, upon the shafts *d d* of which they turn loosely, and they are of corresponding diameter, or thereabout, with the carrying-wheels, the chains B B passing, as described, in reverse directions over the wheels A and C, and around intermediate front and back guide-rolls D E, which may be adjustable by means of screws *e* to keep the chains at the necessary tautness. The inner length or line of these chains travels in common with the carrying-wheels A—that is, toward the back of the machine, or in the diverging direction of said wheels, as indicated by arrow in Fig. 4, and the carrying-wheels A, the idlers C, and the guide-rolls D E at each side or end of the machine are carried by turn-tables F to vary the obliquity, as required of the selvage-carrying wheels and holding-chains. This is done independently, as regards the two sets of selvage-controlling devices on opposite sides of the machine, by means of screws *f* and worm wheels or sectors *g* connected with the turn-tables F. These turn-tables F are carried by slides G, adjustable by means of right and left hand screw-threads *h* on a shaft, I, along a lower cross bed or beds J to vary the distance apart of the selvage-carrying and holding or stretching devices. The selvage-carrying wheels A A, which may be of any suitable elastic or roughened construction on their peripheries, are driven by bevel-pinions K K arranged to gear with miter wheels or surfaces L L on the outer faces of the carrying-wheels, the shafts *k* of said pinions passing down through lower studs or sleeves of the turn-tables F, and carrying on their lower ends bevel-pinions M M, which gear with bevel-pinions N N on independent lower horizontal shafts O fitted with independent conical pulleys P P, to either or both of which motion is communicated by bands or belts from conical pulleys Q Q fast on a general horizontal driving-shaft R. This arrangement or combination of devices admits of one set of selvage driving and holding devices being run or driven in a positive manner at a different velocity from those on the other side of the machine, or the one set of such devices may be temporarily arrested to provide for various contingencies as regards the run of the fabric at the one selvage relatively to the other, or to the body of the fabric. This is done by shifting the belts or bands which connect the conical pulleys Q Q with the independently-operating conical pulleys P P, by means of sliding belt-shifters S S. These belt-shifters may be actuated in various ways, but preferably by the feet of the operators—as, for instance, by means of pinions T arranged to gear with sliding racks V carrying the belt-shifters, the shafts *l l* of said pinions being

provided with foot-rolls V for the purpose of enabling the operators to actuate the pinions to the right or to the left as required, by simply slightly working the foot on or over the rolls. Instead of the foot-rolls being on the shafts *l l* the said shafts may be geared by bevel-gears with two short horizontal shafts arranged parallel with the shaft O, and the foot-rolls may be arranged on the two shafts in a positive manner near together to be conveniently worked by one operator sitting in front of the machine. The combination of the primary conical pulleys Q Q and secondary independently-operating conical pulleys P P, for separately or independently regulating the motions of the two sets of selvage-carrying or feeding and holding devices on opposite sides of the machine, constitutes a very simple and effective means for attaining the desired end. Furthermore, by the concentric arrangement of the shafts *k* with the turn-tables F, the turning of the tables in no way interferes with the driving of the wheels A A under all adjustments of the latter. To provide for the setting in or out, relatively to each other, of the selvage-carrying wheels A A by the movement of the slides G along the bed or beds J, the pinions N should be fitted to slide by feather on the independent shafts O which carry them, or other provision should be made for the adjustment of the said gears.

Arranged across the machine, at the foot of the chains B B, or immediately below the guide-rolls E E, around which the back ends of the chains pass, is a delivery-roller, A', beneath which the fabric passes in an upward direction to the first of the usual or any suitable series of drying-rolls. This interposition of the roller A' between the delivery ends of the chains and said drying-cylinder serves to prevent the stretched fabric from losing its stretch in passing from the tentering devices to the drying-cylinder by reducing the exposure of the fabric to an unsupported run during such passage. I prefer to apply to this roller some means of producing friction to act as brake, that the roller may produce a drag on the fabric. Instead of the roller, a bar might be used, but the roller with friction is preferable. When it is not desired to maintain at a fixed tension the stretch of the fabric between said roller or bar and the drying-cylinder, then the selvage carrying and stretching devices and roller A', or bar on the delivery side of the latter, may be moved in common farther away from the first drying-cylinder.

The friction frame or drag interposed between the selvage carrying or holding and stretching devices for stretching the fabric between its selvages and preventing its body from running ahead of the selvages, is of stationary construction and composed of any number of divided stringers extending across the machine, and so that the same are not only capable of being expanded or contracted in a transverse relation with the feed or run of the fabric over them, but also capable of being set

straight or of being bowed in or out radially, in relation with the traveling selvage-carriers, for the purpose of adjusting the stretch on the body of the fabric. To this end the stringers composing the drag are made up of longitudinally-slotted bars B' B' and C' C', with or without wings D' D', the whole being carried in an adjustable manner, as regards setting them in or out relatively to the axes of the wheels A A, by means of attached sliding rods or guides b' b' entering fixed standards E', and retained in position therewith by set-screws or otherwise, and the center bars C' C' of each stringer being jointed or pivoted to each other, as at e.

It is preferred to leave a wide vacant space, as at G', between these stringers composing the drag, in the upper portion of the latter, for the purpose of allowing the fabric by slightly sagging, to adjust or recover itself if unduly or irregularly stretched in its passage over the drag.

I claim—

1. The combination, with the oblique or divergently arranged selvage-carrying wheels A A of the loose side wheels or idlers C C, the chains or bands B B and the front and back guides or rolls D E, substantially as specified.

2. The combination, with the selvage-holding chains or bands B B and the selvage-carrying wheels A A of the transverse delivery and drag-roller A', arranged at the foot of said chains, in rear of them, essentially as and for the purpose herein set forth.

3. The turn-tables F, in combination with the slides G and selvage carrying and stretching devices, mounted on or carried by said tables, substantially as specified.

4. The combination, with the turn-tables F and the slides G, of the upright shafts *k*, arranged to occupy a concentric relation with said tables, the pinions K, and the miter-wheels or surfaces L, attached to the selvage-carrying wheels A, substantially as described.

5. The combination, with separately-hung and independently-operating selvage-carriers on opposite sides of the machine, of means, substantially as described, for positively driving said carrying devices at different velocities relatively with each other, essentially as and for the purposes herein set forth.

6. The combination of the conical driving-pulleys Q Q with the conical secondary pulleys P P, the independent shafts O O, the belt-shifters S S, and gearing connecting the independent shafts O O with the selvage-carrying wheels A A, essentially as and for the purposes herein set forth.

7. The combination of the foot-rolls V V and their shafts *l l* with the belt-shifters S S, the conical driving-pulleys Q Q, and the secondary independently-operating conical pulleys P P, substantially as specified.

8. The friction frame or drag constructed of stringers composed of sliding and jointed sections, substantially as described, whereby said frame may not only be expanded or contracted longitudinally, but may also be set in or out and bowed in a radial direction relatively with the selvage carrying and stretching wheels or devices, essentially as herein set forth.

ISAAC E. PALMER.

Witnesses:

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FRED. HAYNES.