(No Model.)

J. HAWTHORN, J. P. LIDDELL, & P. HAWTHORN.

ROLLER FOR STRETCHING FABRICS.

No. 281,503. Patented July 17, 1883.

FIG. 1

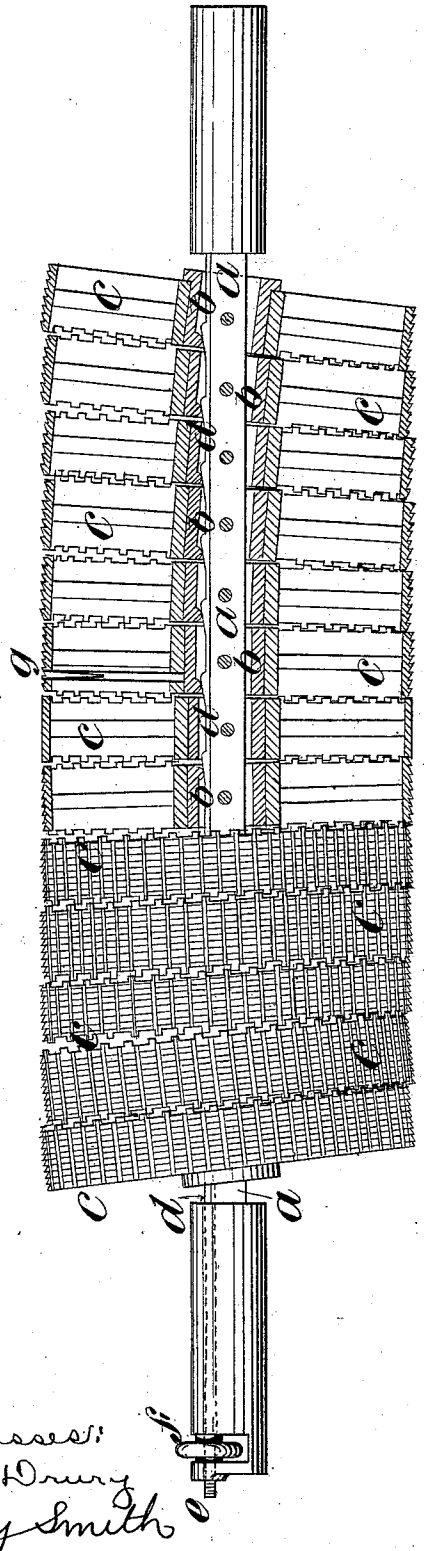


FIG. 3

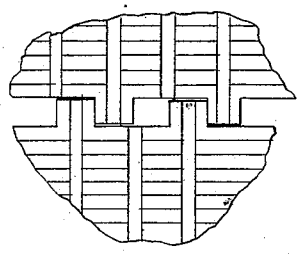
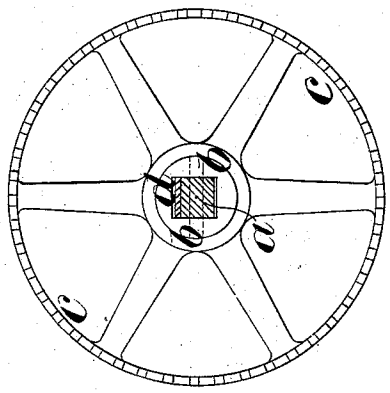


FIG. 2



Witnesses:
Harry Drury
Harry Smith

Inventors:
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and
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by their attys:
Howson & Sons

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

JOHN HAWTHORN, JOHN P. LIDDELL, AND PETER HAWTHORN, OF NEWTOWN, COUNTY OF CHESTER, ENGLAND.

ROLLER FOR STRETCHING FABRICS.

SPECIFICATION forming part of Letters Patent No. 281,503, dated July 17, 1883.

Application filed December 4, 1882. (No model.) Patented in England March 15, 1881, No. 1,111.

To all whom it may concern:

Be it known that we, JOHN HAWTHORN, JOHN PEMBERTON LIDDELL, and PETER HAWTHORN, residing at Newtown, in the county of Chester, England, and subjects of the Queen of Great Britain and Ireland, have invented certain Improvements in Rollers for Stretching Fabrics, (for which we obtained a patent in Great Britain, No. 1,111, dated March 15, 1881,) of which the following is a specification.

Our invention relates to the rollers which are employed in connection with machinery for treating or operating upon fabrics, and are intended to stretch the fabrics so as to increase the width from selvage to selvage, or to restore the full width of the fabric. In the stretching by ordinary means the selvage of the fabric is subjected to great strain, which in some cases causes the fabric to be torn or damaged.

The object of our invention is to prevent this by acting upon the whole width of the fabric from about the center to the selvages. For this purpose we employ a combination-roller consisting of a number of wheels, pulleys, or rollers arranged to revolve upon axes which are inclined from a straight line, the inclination increasing as the axes become farther removed from the center of the combination, this inclination being variable by means of a sliding bar, as hereinafter described.

In the accompanying drawings, Figure 1 is a view partly in section, representing the complete roller. Fig. 2 is a cross-sectional view of the same. Fig. 3 is an enlarged view of a portion of the meeting edges of two contiguous sections of the roller.

In the figures, *a* is a rectangular shaft, which is suitably formed at each end to rest in brackets, supports, or bearings in the machine to which the roller is applied. Upon the said shaft are mounted a number of bushes or ferrules, *b b*. Each bush is formed with a rectangular opening to suit the shaft, and is secured to the shaft by means of a pin, which permits the bush to swivel to some extent. Each bush is turned, and upon it is mounted a wheel, *c*, which is bored to suit the bush, so that it can revolve thereon. In the example there are thirteen wheels, and the bush upon which the central wheel, *c'*, revolves is fixed to the shaft, so that the wheel can revolve upon an axis which coincides with the axis of revolution of the roller-journals. The bushes upon which the other wheels revolve are tilted or inclined, so that the axis of revolution of six wheels on each side of the central wheel are inclined with respect to the axis of the roller-journals, the inclination of the axis of each wheel increasing in proportion as it is more remotely situated with respect to the central wheel, as represented in Fig. 1. A bar, *d*, is fitted to slide upon the shaft, and upon this bar are formed inclines, which act upon rounded projections which are formed upon the interiors of the bushes, with the exception of the central bush, as seen in Fig. 1. Each projection is formed on the side of the bush which is nearest to the central wheel, so that when the bar is drawn in the direction of the arrow the bushes become tilted right and left from the center, whereby the inclination of the axes of the wheels *c* is increased. On the contrary, when the bar is moved in a direction contrary to that indicated, the inclination of the axis is reduced. The said bar is acted upon by means of a screw, *e*, upon which is mounted a nut, *f*, which can be turned when the adjustment of the bushes is desirable, the said screw *e* being secured to the end of the bar *d* or forming part thereof, as indicated by dotted lines in the drawings. The peripheries of the wheels are turned with bevel-grooves, which incline away from the center of the system, as seen in Fig. 1, and grooves are also cut across the breadth of the wheel, in order that the ridges between the said bevel-grooves may be formed into teeth which can take hold of the fabric to be stretched. In lieu of this method of roughening, the peripheries may be covered with "card," or be otherwise adapted to take hold of the fabric. The adjacent edges of the wheels are also cut or formed with teeth, which gear together, as seen in Fig. 3. The formation insures that when the roller is in use the whole of the wheels shall revolve in unison. Other means may be adopted for effecting the same object—as, for example, studs or projections on one wheel may engage with arms or with a suitable part of another wheel. When the roller is in use, the fabric is drawn over the roller, the shaft *a* being prevented from revolving. When the greatest effect is re-

quired, the fabric is caused to make the first contact with the roller at the part where the wheels approach each other most closely, and is kept in contact with about half of the circumference of the roller. As the wheels revolve they diverge, owing to the inclination of their axis, and the fabric becomes stretched in the direction of its width, as will be well understood. By turning the central shaft in its bearings or supports the fabric may be caused to make the first contact with the wheels after they have diverged to some extent, in which case the fabric will be stretched to a lesser extent. The action of the roller can also be regulated by turning the nut *f*, so as to vary the inclination of the axes of the wheels, as hereinbefore mentioned. In order that lubricant can be supplied to the bearings of the wheels upon the bushes, we fix a tube, *g*, in each wheel, the said tube extending from the periphery of the wheel to the bearing, and we fix a conical tube to the mouth of the said tube, the smaller end of the cone being inward. This arrangement prevents the escape of oil from the tube as the wheel revolves. The central section may be broader than the others, or there may not be a central section, or there may be more than one.

We claim as our invention—

The combination of a central shaft and bushes or ferrules *b*, hinged to said shaft, with wheels or sections *c c*, mounted on said bushes, and an adjustable bar, *d*, adapted to act on said bushes and vary their axial inclinations, substantially as set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

JOHN HAWTHORN.
JOHN P. LIDDELL.
PETER HAWTHORN.

Witnesses:
EDWARD K. DUTTON,
DAVID FULTON.