

(No Model.)

2 Sheets—Sheet 1.

O. E. DROWN.
CLOTH STRETCHING MACHINE.

No. 546,092.

Patented Sept. 10, 1895.

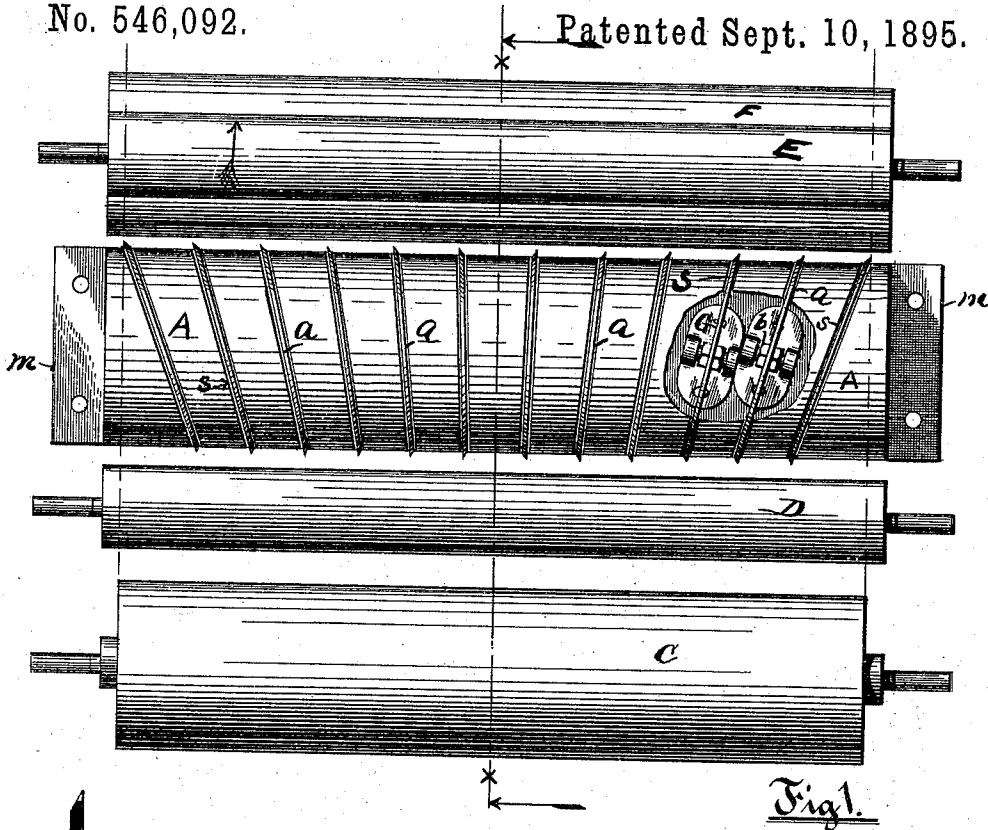


Fig. 1.

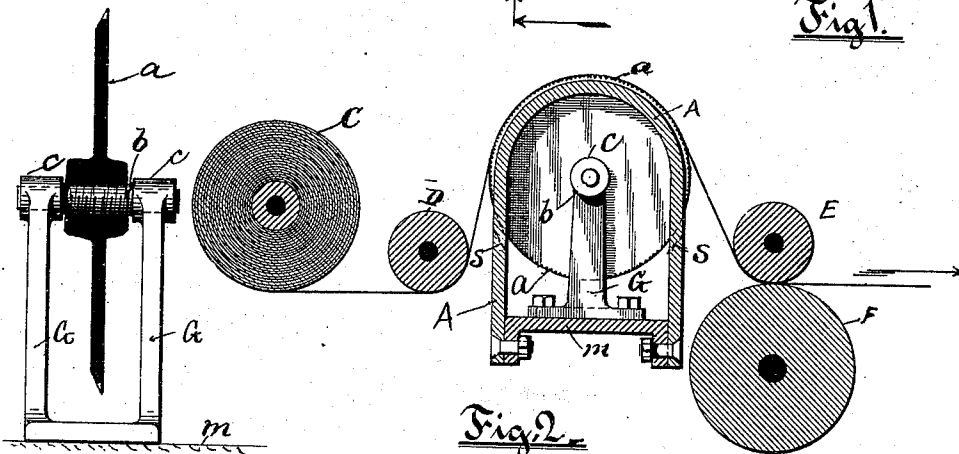


Fig. 2.

Fig. 3.

Witnesses.

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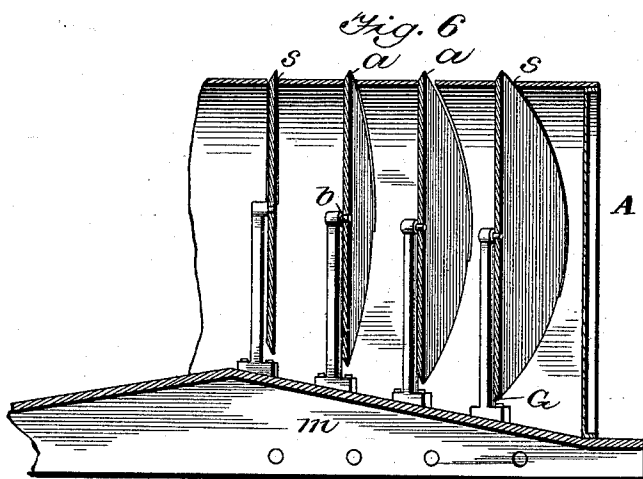
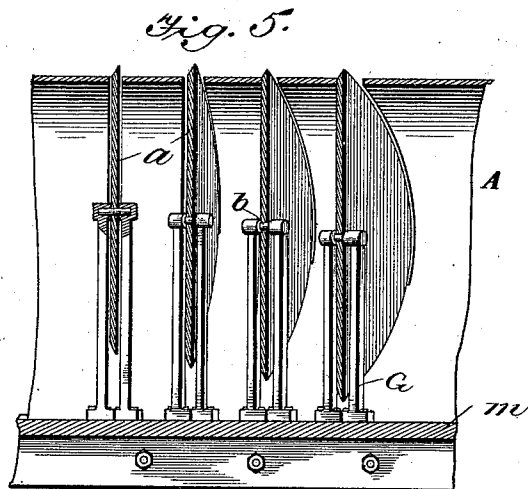
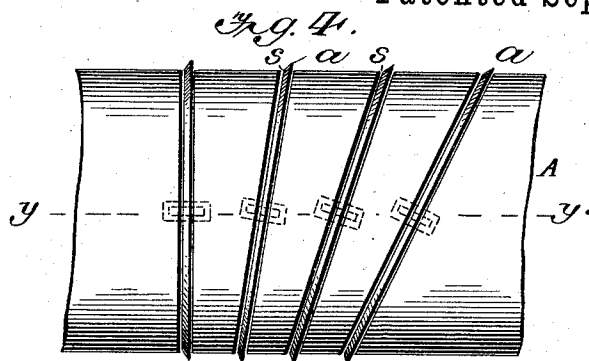
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2 Sheets—Sheet 2.

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Witnesses
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UNITED STATES PATENT OFFICE.

OTIS E. DROWN, OF PAWTUCKET, RHODE ISLAND.

CLOTH-STRETCHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 546,092, dated September 10, 1895.

Application filed June 6, 1894. Serial No. 513,675. (No model.)

To all whom it may concern:

Be it known that I, OTIS E. DROWN, a citizen of the United States, residing at Pawtucket, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Cloth-Stretching Machines; 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.

My invention relates to machines used for stretching cloths or other fabrics in a lateral direction. Stretchers of this class are well adapted to receive the continuous web of wet fabric as it comes from the washing machine or mangle, and at the same time to both smooth it by removing the wrinkles and to increase its width. The thus-treated fabric may then be passed to suitable calendering mechanism to be further acted upon as desired.

The object of this invention is to provide means whereby the whole width of the cloth or fabric is gradually acted upon and in an increasing degree from the center toward each selvage of the fabric. For this purpose I employ a series of rolls or disks of increasing diameter independently mounted upon axes in a stationary housing or guide and revolving therein, over the tops of which the cloth passes for treatment. The said rolls or disks are placed in the housing or guide at varying angles, and as drawn they radiate from one common center. The upper peripheral surface of the rolls or disks projects through and above the stationary housing or guide and parallel with the top surface thereof, so as to produce, while revolving therein by frictional contact with the cloth, a gradual lateral divergent movement of the two selvages, and thus gradually and uniformly stretch the width of the fabric acted upon.

To more fully describe and illustrate my improved stretching-machine I have prepared the accompanying sheet of drawings, whereon—

Figure 1 represents a plan view, a portion of the housing or guide being broken away.

Fig. 2 is transverse sectional view taken on line $x x$ of Fig. 1. Fig. 3 is a side elevation, enlarged, showing sectionally one of the cloth-stretching disks. Fig. 4 is a plan view of a portion of the machine on an enlarged scale, and Fig. 5 is a longitudinal vertical section on the line $y y$ of the latter. Fig. 6 shows a modified form of the supporting-base.

In the drawings, I have represented my improved cloth-stretching device as combined with a guide-roll D, adapted to properly deliver the fabric to the stretcher, and a pair of calender-rolls E F. These latter may be constructed and actuated in any well-known manner.

In my improved cloth-stretching machine I employ a fixed base member, as m , adapted to be secured to any suitable foundation or support. To the top of said base is secured a longitudinally-extending shell or housing A, whose upper-half portion is curved, being in fact practically semicircular. The curved surface of the shell is true and smooth and serves as a guide or support for the fabric when the latter is passing over it. The shell is provided with a series of obliquely-arranged openings s , extending therethrough transversely. These several openings vary in inclination and are oppositely arranged, thus forming double inclined openings, as clearly shown in Fig. 1. Since the openings vary in degree of inclination, it is obvious that they are not parallel with each other. The several openings may converge to a common point located beyond the periphery of the shell. Within the shell A are mounted rotatable disks or stretcher-wheels a . These disks extend uniformly through the semi-circumference of the several openings s a short distance (a disk for each opening) and are adapted to engage the contiguous side of the fabric. The several disks, while being uniform in thickness, vary in size or diameter to correspond with the varying inclination of the said openings.

The housing A may be made of suitable metal, as brass, and provided with a smooth surface for supporting the fabric during its passage over it, thereby preventing it from sagging and rolling down between the several disks. The openings s are so arranged that they gradually increase in obliquity from the center portion of the housing to the ends.

The disks *a* may be mounted upon screw-threaded arbors *b* in a manner similar to that employed for securing circular saws to arbors. The arbors *b* are supported in bearings *c*, forming a part of the brackets *G*, the latter being fastened to the housing-base *m*. (See Fig. 2.) It will be apparent, since the disks are located at different angles with respect to the axis of the housing, and since they extend through the latter a uniform distance, that they must necessarily vary in diameter. In fact they do so differ in size, the smallest being at or near the center of the housing and the largest at the ends of the stretcher. In order to maintain the upper semi-circumferences of the disks in alignment the brackets *G* are made variable in height, the shortest being at the ends. The brackets are arranged so that the arbors revolve freely in the bearings *c*. If desired the arbor may be non-rotatable, the disk in such case being adapted to revolve on the arbor. The outer edge or periphery of each disk is beveled and may be roughened or provided with short projecting pins or spurs adapted to engage the under surface of the fabric to prevent the latter from slipping during its passage. The working edges of the disks are in true alignment and parallel with the convex surface of the housing.

In Fig. 2 I have shown the relation of the web of cloth to the stretcher, &c. The roll *C* of cloth may be located above or below or some distance away from the machine. It is desirable, however, to employ the small guide-roll *D*, the position of the latter being such that it serves to properly lead the cloth to the stretcher. The relation of the calender or compression-rolls *E F* to the stretcher may in like manner be varied so long as sufficient frictional surface contact of the fabric acted upon is maintained on the stretcher's surface.

To prevent any unnecessary unwinding of the filled fabric-roll while the machine is in operation, fractional resistance may be applied to the axle of the same, as common to machines of this character, which consists, generally, of a leather strap-brake. I may add that the angle of the rolls or disks *a*, which as drawn radiates from one common center, may be of any desired degree by changing the location of the brackets *G*, the slots *s* in the housing being cut correspondingly. A slight change in the angle of the disks and the brackets may be made at will to adapt them to the requirements of various fabrics. It is obvious that the diameter of the outer or end disks exceeds that of the center disks, the several disks increasing in diameter from the center to the ends of the stretcher, and since the projecting or working portions of the disks are in alignment it follows that the axes of the disks must lie in different horizontal planes, as clearly shown in Fig. 5. In case the base *m* be parallel with the top surface of the housing *A*, as drawn, the brackets vary in height, as before stated. Brackets

uniform in height may be used. In such case, however, the base *m* should be inclined from the center downwardly toward the ends.

By mounting the disks independently upon their support, instead of upon a common central rod or bar, I am enabled to effect a result never hitherto attained, so far as I am aware—that is, to arrange the disks so that although progressively inclined to the direction of travel of the fabric the tops of the disks are on the same level, and at the same time the edges of the disks which first came into contact with the cloth contact with the same simultaneously. Hitherto when vertical disks have been employed they have had a common support passing through their centers, and necessarily, when the tops of the disks were on a level, the sides of the disks were not in line with each other, but the sides of the disks that were farthest from the centers, and therefore were more oblique in direction, were farthest from the advancing cloth. Now, two objects are of great importance in mechanism for stretching cloth—first, that the cloth should contact with the stretcher-disks simultaneously at all points along a straight line transverse of the cloth; second, that the cloth should be carried to the same level or height at all points of said line.

Devices hitherto constructed for stretching cloth have had the tops of the disks on the same level, but by reason of the progressive obliquity of the disks the front edges of the disks or the points of contact with the advancing cloth were not in the same plane and did not simultaneously engage the cloth.

I claim as new and desire to secure by United States Letters Patent—

1. In a cloth stretching device, a series of disks adapted to be engaged with and rotated by the traveling fabric, and arranged at progressively increasing inclinations to the direction of travel of the fabric, said disks being rotatively mounted on separate or independent standards extending beyond the peripheries of the disks and there resting upon a common support, substantially as described.

2. In a cloth stretching device, a series of vertical disks adapted to be engaged with and rotated by the traveling fabric, and arranged at progressively increasing inclinations to the direction of travel of the fabric, said disks being rotatively mounted on separate or independent standards extending beyond the peripheries of the disks and there resting upon a common support, substantially as described.

3. In a cloth stretching device, a series of disks adapted to be engaged with and rotated by the traveling fabric, the axes of said disks being all horizontal but at successively lower elevations, substantially as described.

4. In a cloth stretching machine, a series of disks of progressively increasing obliquity adapted to be engaged with and rotated by the traveling fabric, the tops of said disks

being disposed at the same height but their axes at different heights, substantially as described.

5 In a cloth-stretching machine, the combination with a fixed cloth-supporting shell or casing having straight parallel sides, of a series of independently mounted rotatable disks varying in diameter and extending outwardly through the walls of the shell; said
10 disks being disposed at different angles and

converging toward a common point located exteriorly of said shell, substantially as described.

In testimony whereof I have affixed my signature in presence of two witnesses.

OTIS E. DROWN.

Witnesses:

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IDA M. WARREN.