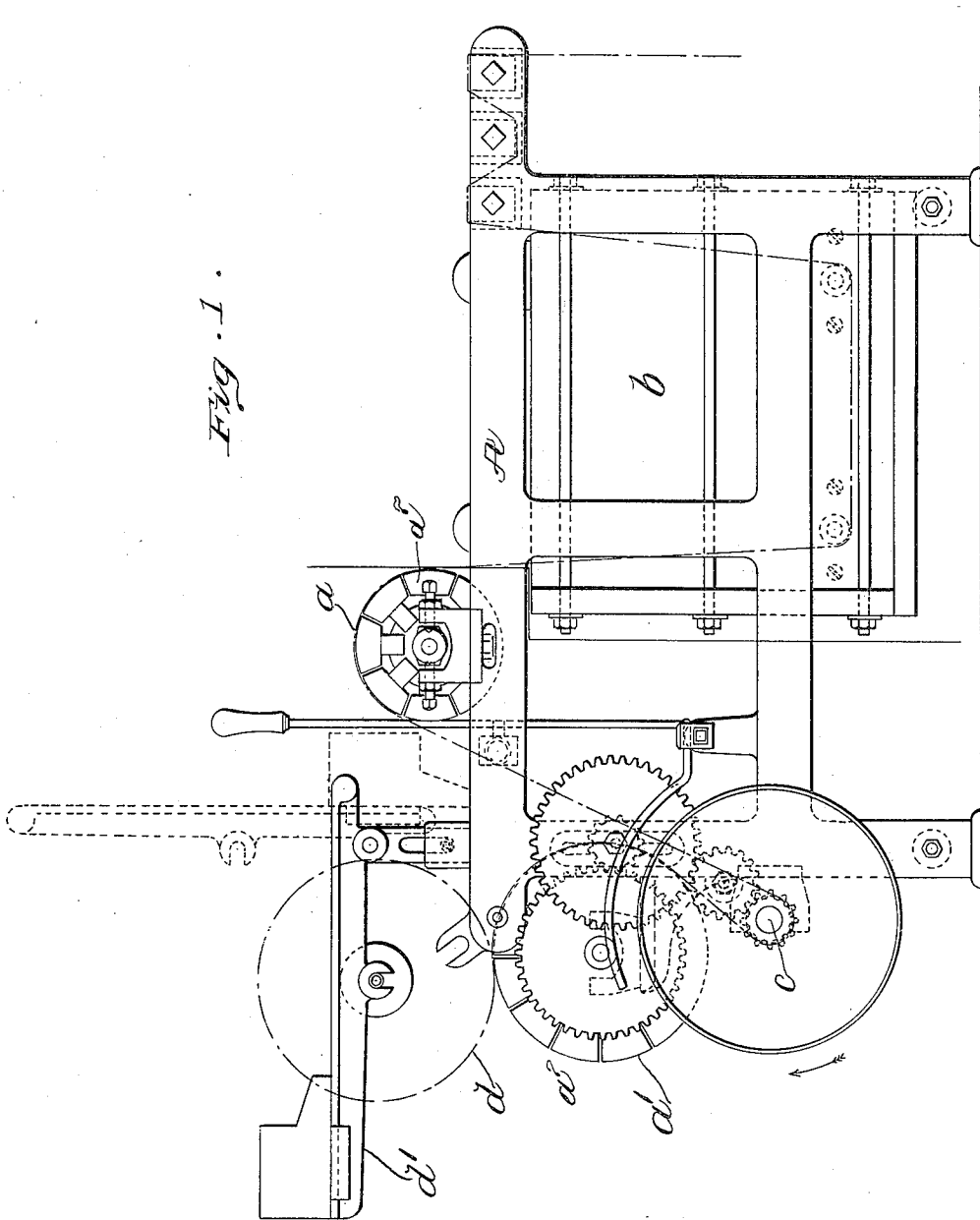


1,132,033.

Fig. 1.



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Inventor:
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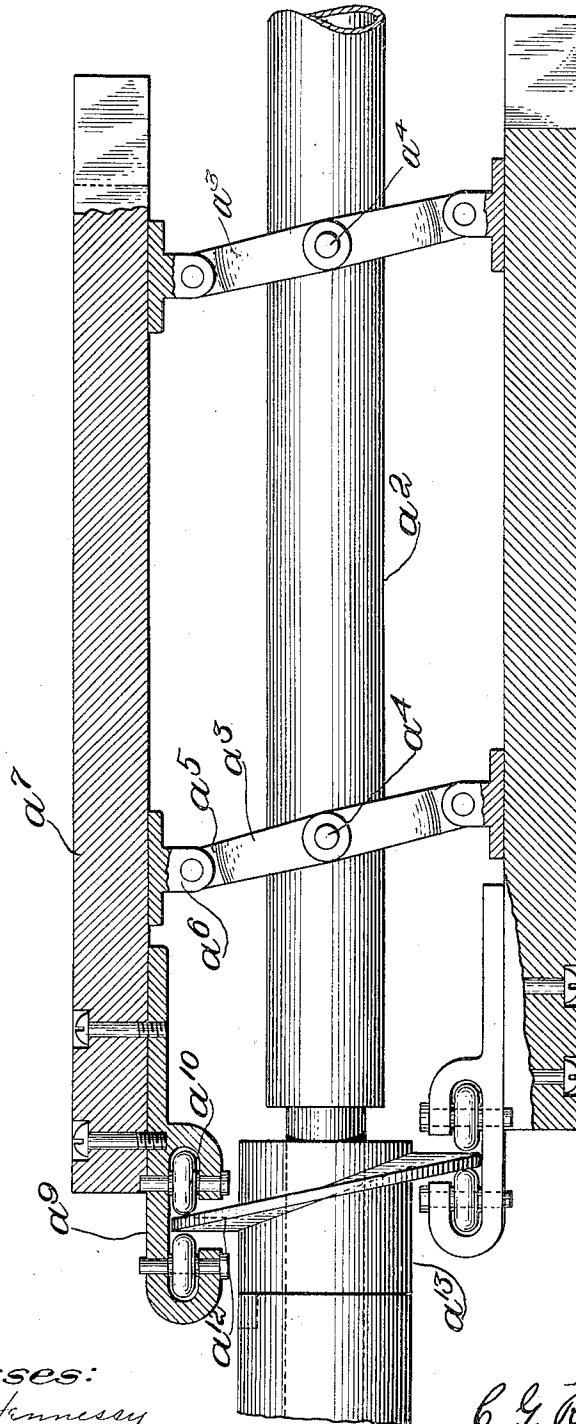
C. G. RICHARDSON.
CLOTH STRETCHING AND ROLLING MACHINE.
APPLICATION FILED JAN. 20, 1909.

1,132,033.

Patented Mar. 16, 1915.

3 SHEETS-SHEET 2.

Fig. 2.



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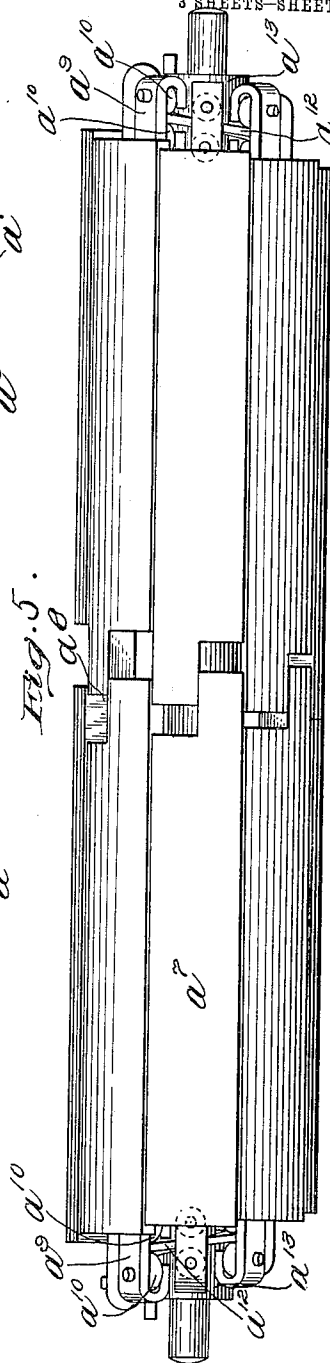
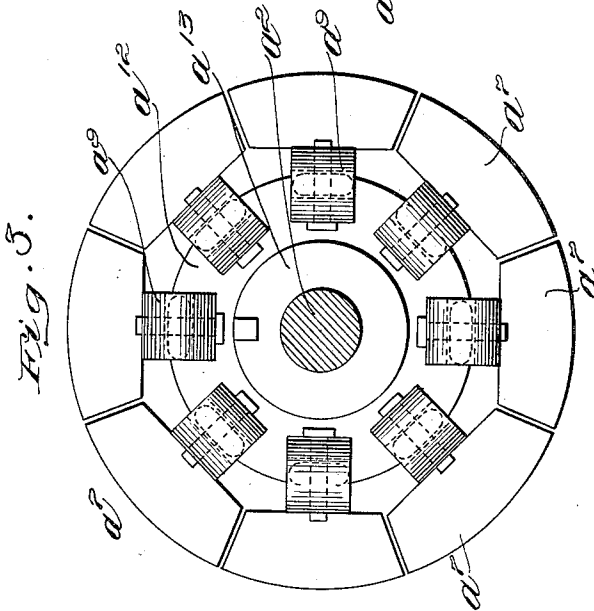
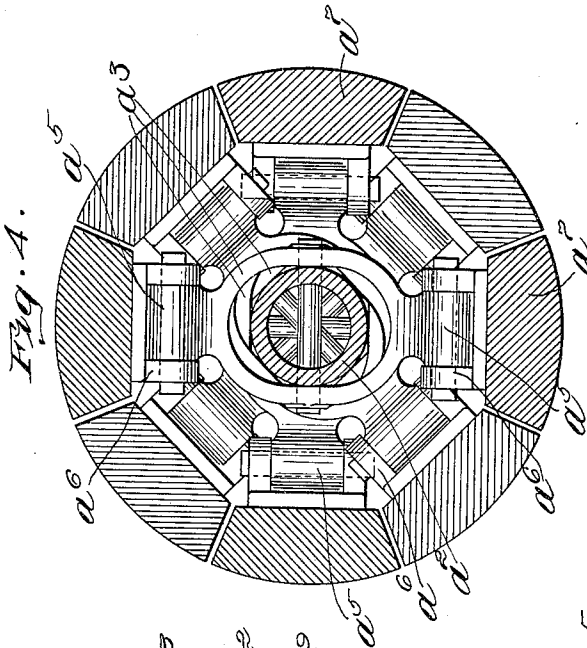
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

CHARLES G. RICHARDSON, OF SPRINGFIELD, VERMONT.

CLOTH STRETCHING AND ROLLING MACHINE.

1,132,033.

Specification of Letters Patent.

Patented Mar. 16, 1915.

Application filed January 20, 1909. Serial No. 473,345.

To all whom it may concern:

Be it known that I, CHARLES G. RICHARDSON, citizen of the United States, and resident of Springfield, county of Windsor, Vermont, have invented certain new and useful Improvements in Cloth Stretching and Rolling Machines, of which the following is a specification.

This invention relates to machines for stretching and rolling cloth and is intended to provide a simple and effective construction by which the cloth is distended or stretched laterally and is wound into a roll while in the distended or stretched condition.

Two main features characterize the invention, one being the construction and arrangement by which the cloth passes directly from the point of maximum stretch upon the winding roll or drum so that the full tension of the stretch is preserved in the roll; the other feature consists in the construction and arrangement of the stretching cylinder itself by which the cloth is distended preparatory to winding the same.

In the accompanying drawings I have illustrated one of the modes of embodying the principles of this invention.

Figure 1 is a side elevation showing a general view of the pertinent parts of the machine. Fig. 2 is a detail of the stretching cylinder in central vertical section. Fig. 3 is an end elevation thereof. Fig. 4 is a central cross section of the cylinder; and Fig. 5 is a side elevation thereof.

In Fig. 1 of the drawings I have shown the general arrangement of the parts of the machine that are pertinent to an understanding of the invention, various unimportant details thereof being omitted.

In the practice of the invention as illustrated there is mounted in the main frame A of the machine the first stretching cylinder *a* over which the cloth passes from the vat *b* around an idler roll *c* over the second stretching cylinder *a'*. The stretching cylinders themselves are of like construction and comprise a central rotary and preferably hollow shaft or drum *a²* to which are pivoted a series of oscillatory yokes *a³* arranged in pairs to swing about parallel axes *a⁴* in a plane axial to or longitudinal of the axis of rotation. At their opposite ends these yokes are provided with projecting

lugs *a⁵* adapted to form a pivotal or angle joint with brackets *a⁶* which are secured to the inside faces of the peripheral lags or slats *a⁷* of the cylinder.

The slats *a⁷* are arranged in pairs, the members of each pair being diametrically opposite to each other and secured to opposite ends of the same pair of yokes by the construction just described, so that the lags or slats form the peripheral sections of the sectional stretching cylinder. As shown in Fig. 5 the slats extend from the end portion only to the middle portion of the cylinder, their inner ends being cut away or rabbeted as shown at *a⁸* to allow them to overlap.

The outer end of each slat or section is provided with a bracket *a⁹* carrying a pair of spaced anti-friction wheels or rolls *a¹⁰* slightly spaced apart to receive and engage between them the opposite faces of a spiral cam blade *a¹²* which is secured to a non-rotatable hub *a¹³* through which the journal of the rotary shaft *a²* is passed. According to the arrangement in the drawings the cam *a¹²* is so disposed that its innermost portion is at the bottom, while its outermost portion is diametrically opposite at the top portion of the cylinder and so that as the cylinder rotates the ascending series of lags or sections are moved gradually outward in a longitudinal or axial direction until they reach the top, which is the point of their extreme outer movement and then as they successively descend on the other side they are gradually returned to their inmost position, the extreme inmost position being reached at the lowest point of their movement. As the peripheral sections or lags at either end of the cylinder are drawn apart as they move from the lowermost to the topmost position during rotation, they gradually distend the cloth which is carried into contact with them at approximately their lowermost position and which leaves the cylinder at the topmost position, that is the point of greatest distention or stretch.

The winding roll *d* is located to rest upon or engage the second stretching cylinder *a'* at its topmost point or essentially where the maximum of the stretching movement of the cylinder is attained. It is held in place by the pivoted weighted arm *d'* and is rotated by its engagement with the sectional stretching cylinder *a'*. By this arrangement

the cloth is rolled smoothly upon the winding roll while in its condition of greatest distention, since its position in the cylinder makes it impossible for any contraction or shrinkage of the stretched cloth to occur by reason of the fact that the cloth is laid directly upon the winding roll by the last stretching cylinder.

Not only is it true that the pivotal yokes which act simultaneously to support and to move the lags or sections of the cylinder afford a simple and durable construction not affected by wear, but it also has the further advantage that by reason of the swinging movement the lag starting from its point of initial engagement with the cloth at the bottom of its rotation, tends to move outwardly as well as longitudinally to increase its grip or tension on the cloth at this stage of the operation.

It will be understood that the precise number of lags employed is unimportant, nor is it essential that the cylinder cam should be arranged so that the point of greatest distention will necessarily correspond to the mathematically highest point of the cylinder. Indeed, as shown in Fig. 1, the preliminary stretching roll *a* is so arranged that the extreme spreading or stretching movement of the lags occurs after each lag has passed by the highest point. The important consideration in order to get the greatest possible effect, is that the cloth should begin to engage the stretching cylinder at the point of its greatest contraction or shortest effective length and should leave the stretching cylinder at the point of greatest distention where the co-acting members of each pair of lags are at their point of greatest separation or greatest effective length. If, however, it is not desired to give the full maximum distention to the cloth, the cam may be adjusted circumferentially so that the cloth leaves the stretching roll some distance before the position of maximum distention is reached.

What I claim is:

1. In a cloth stretching machine the combination of the cylinder embracing peripheral stretching sections movable longitudinally to stretch the cloth, and a winding roll mounted in position to rest upon the stretching cylinder and be rotated thereby to receive and begin winding the cloth at the point where the sections successively have reached the limit of their maximum distention, substantially as described.

2. In a cloth stretching machine the combination of a rotary stretching cylinder embracing extensible peripheral sections for engaging and stretching the cloth, and a rotatable winding device arranged to press against the stretching cylinder at a point where its sections are extended in order to wind the cloth while distended into a roll,

the winding device being rotatably driven by means of the stretching cylinder, substantially as described.

3. In a cloth stretching machine the combination of a stretching roll embracing extensible stretching sections, a receiving roll mounted to engage said stretching roll at a point where the extension movement of the sections cease and to receive the cloth directly therefrom, said receiving roll being rotated by the stretching roll and a weighted pivoted arm for keeping said receiving roll in direct engagement with said stretching roll, substantially as described.

4. In a cloth stretching machine the combination of a preliminary stretching roll to receive and stretch the cloth issuing from the vat, a second stretching roll arranged to receive the cloth and complete the stretching operation, and a receiving roll mounted to rest against said second stretching roll so as to take the cloth while distended directly from said second roll and wind it while in distended condition, substantially as described.

5. A cloth stretching cylinder embracing a rotary shaft, and peripheral sections mounted upon oscillatory supports carried by said shaft to stretch or distend the cloth in engagement therewith, substantially as described.

6. A cloth stretching cylinder embracing a series of separate sections or lags forming the periphery of the cylinder, oscillatory supports therefor having longitudinal movement to and fro to increase the effective length of the cylinder to stretch the cloth, and a central rotary shaft to which said supports are pivotally attached and by which they are rotated, substantially as described.

7. A cloth stretching cylinder embracing in its construction a rotary shaft, a series of pivoted yokes pivotally mounted upon said shaft and carried thereby, a series of peripheral lags supported by said yokes, and means for moving said lags successively outwardly and inwardly to alternately increase and diminish the effective length of the cylinder in order to stretch the cloth, substantially as described.

8. A cloth stretching cylinder embracing in combination, a rotary shaft, a series of yokes surrounding said shaft and pivotally connected thereto, oppositely disposed peripheral lags secured to each pair of yokes, a stationary cam mounted adjacent to each end of the cylinder, and means carried by each lag for engaging said cam to cause the lags to swing to and fro in succession as the cylinder is rotated, substantially as described.

9. A cloth stretching cylinder embracing in combination a rotary shaft, oscillatory yokes pivotally mounted thereon to rotate

therewith, lags secured to the opposite ends of said yokes and forming the periphery of said cylinder, each lag being provided with oppositely disposed adjacent anti-friction rolls, and a stationary cam interposed between said anti-friction rolls to cause each lag to swing to and fro, substantially as described.

10. A cloth stretching cylinder embracing a rotary shaft, a series of peripheral lags extending longitudinally of the cylinder from the end to the middle portion thereof, the inner ends of said lags being overlapped to form a continuous but expansible and contractible cylindrical support, a pair of parallel yokes forming a pivotal connection and support between said shaft and each pair of opposite lags, each lag being provided with oppositely disposed anti-friction rollers, and a stationary member for engaging said rollers to move the lag to and fro as the cylinder revolves, substantially as described.

11. In a cloth stretching machine the combination of the stretching cylinder or

drum whose periphery comprises longitudinally movable slats for stretching the cloth transversely, and a winding roll normally resting in contact with said cylinder at the point where the maximum stretching movement is completed in order to receive and wind the cloth in its distended condition, said winding roll being rotated by said stretching cylinder, substantially as described.

12. A cloth stretching cylinder embracing in its construction a series of peripheral longitudinally movable slats and means for imparting a movement to said slats longitudinally of the cylinder and at the same time a movement of said slats alternately toward and away from the axis of said cylinder, substantially as described.

In witness whereof, I have subscribed the above specification.

CHARLES G. RICHARDSON.

In the presence of—

BEATRICE BURKE,

HELEN L. SULLIVAN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."