C. A. LUTHER,

CLOTH SPREADERS, &c.

No. 190,600. Patented May 8, 1877.

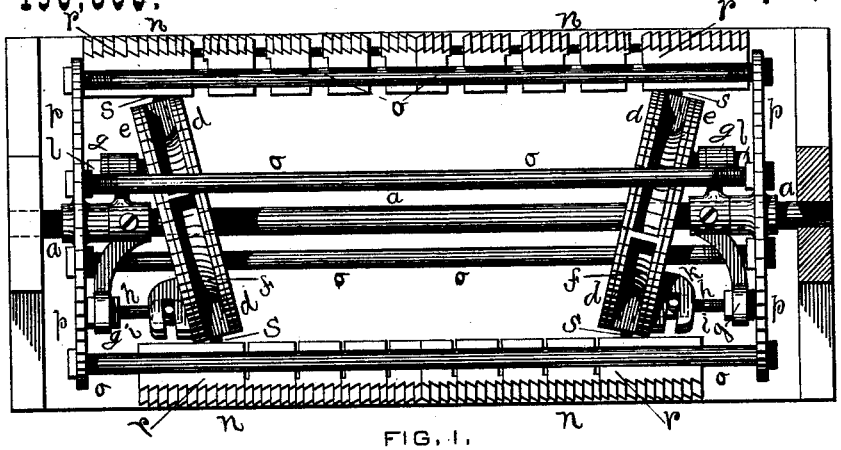

FIG. 1.

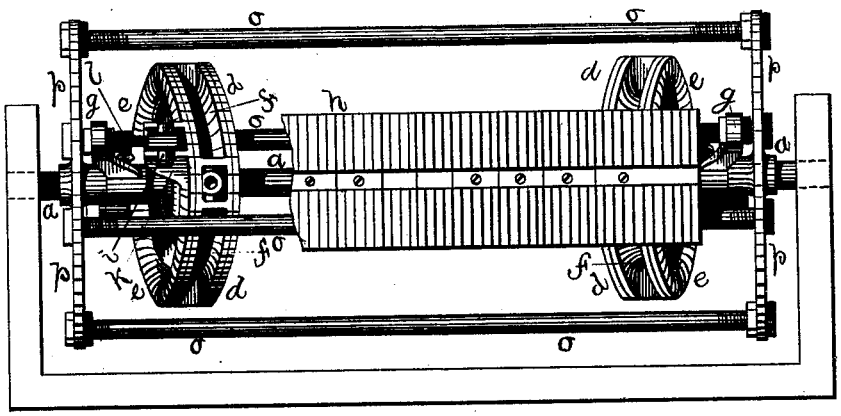

FIG. 2.

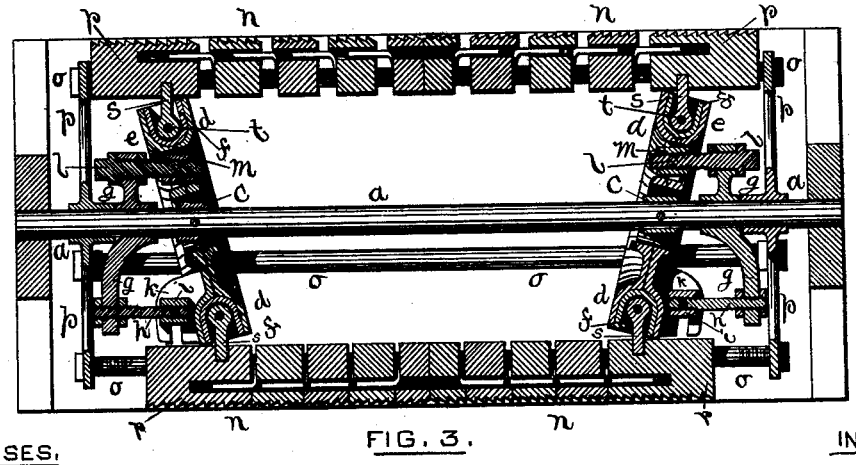

FIG. 3.

WITNESSES.

Thos. P. Barnefield

Geo. Walter Barnefield

INVENTOR.

Charles A. Luther

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CHARLES A. LUTHER, OF PAWTUCKET, RHODE ISLAND.

IMPROVEMENT IN CLOTH-SPREADERS, &c.

Specification forming part of Letters Patent No. **190,600**, dated May 8, 1877; application filed February 28, 1877.

To all whom it may concern:

Be it known that I, CHARLES A. LUTHER, of Pawtucket, in the county of Providence and State of Rhode Island, have made and invented certain Improvements in Cloth-Stretchers and Calendering-Machines, of which the following is a specification:

My said invention relates to an adjustable cam for cloth-stretching and calendering machines, the essential features of which consist in hanging the composite cams upon trunnions projecting from a pivotal block resting in an attachment to the under part of said cam, which block is securely held in position by a suitable bar connected with an independent stationary arm.

The accompanying drawing is hereby made a part of this specification, similar letters of reference thereon indicating corresponding parts.

In said drawing, Figure 1 is a top view of the device. Fig. 2 is a side elevation, having part of the exterior torn away to show interior mechanism. Fig. 3 is a vertical section lengthwise of the stretching-cylinder.

a shows the main shaft, on which are the center-boxes *c c*, as seen in Fig. 3. These center-boxes are furnished with two exterior trunnions each, which fit into trunnnion-rests in the interior of the adjustable cams, and which support the said cams and steady them when in operation. These center-boxes fit onto the shaft by means of a spline, and are allowed a limited sliding motion on said shaft to accommodate the variable relative position of the adjustable cam when the changes are made, as hereinafter described. The said cams are composed of the two outer sides or disks *d e*, the peculiar shape of each of which, as well also as the shape of the chambered ring hereinafter mentioned, is more plainly seen in Fig. 3. The parts *d e* are firmly bolted together and hold between them a superficially chambered ring, *f*, which fits into, and is intended to revolve in, the hollowed periphery of the jointed sides *d e*, as seen in Fig. 3. Attached to each end of the shaft *a* is an angular arm, *g*, the longer end of which supports and firmly holds in place the bar *h*. The opposite end of this bar terminates in a pivotal block, *i*, resting in a double curvilinear attachment, *k*, projecting from the outer sides. This pivotal block *i* is the fulcrum on which the cam is made to oscillate whenever a change of its position is effected, as hereinafter described. The parts forming the cam, as seen at *d e*, are cast with a chamber, in which is placed a smaller pivotal block, *m*. The shorter projection of the arm *g* holds one end of the threaded bolt or screw *l*, the other end of which passes into and through said pivotal block *m*. By the operation of this screw *l*, and its connections, the adjustability of these parts is made available. The outer end of the screw *l* is furnished with shoulders on either side of the short projection of the arm *g*, as seen in Fig. 3, and has a nut-shaped termiuation, by which said screw may be operated. The exterior of the machine consists of the ratcheted longitudinal strips or lags *n n*, which are supported by longitudinal bars *o o*, running between and connecting the outer circular rests *p p*. Although only two of these sliding ratcheted strips are shown in the drawing, yet the entire peripheries of the circular rests *p p*, and the space between them, will be covered by these sliding lags in a completed machine, the remaining strips being omitted from the drawing in order better to exhibit the mechanism and construction of the other parts of the device. The parts *n n* are divided into sections, as seen in Figs. 1 and 3, and these sections are linked together by metallic rods or wires, as shown, there being sufficient play of each section upon its respective link to permit the sections to be spread apart, as seen in the upper parts of Figs. 1 and 3, and afterward to be drawn together, as seen in the lower parts of the same figures. The outermost of these sections *r r* have a lug, *s*, projecting inwardly therefrom into a chamber in the ring *f*, in which it is secured by the transverse pin or shaft *t*, and on which pin or shaft it may have the rocking motion required by the changing positions of the sections aforesaid.

Each of the figures in the drawing show the composite cams set in position for use, their lines of divergence commencing at a point where the sliding strips *n* receive the cloth to be stretched, or material to be finished, their lines of rotation continuing to diverge while

the cloth or material remains in contact with the machine, and as soon as the cloth leaves the stretcher the rotary lines of these cams will converge during the remainder of their revolution.

In the form of the device here shown and described the shaft *a*, and the jointed parts of the cam *d e*, are designed to be stationary, while the circular rests *p p*, and the sectional ratcheted strips aforesaid, have a positive motion imparted to them by the passage of the cloth, or otherwise by direct application of power, as may be preferred. This positive motion of the lags *n n*, coupled with the projecting lug *s*, necessarily revolves the chambered ring *f* in the hollowed periphery of the parts *d e* of said cam. The combination of said lags *n n* and lug *s* with the chambered ring aforesaid causes a gradual but inevitable spreading apart of said sections, and produces a consequent stretch of the cloth, proportionate in degree to the previous adjustment or setting of said cams. It will be seen that the pivotal blocks, trunnions, and pins above mentioned, are necessary features of construction to prevent friction among and breakage of the respectively connected parts, when the device is in operation.

Whenever any change is desired in the position of said cams, to adapt the machine to different kinds and grades of goods, turn the threaded bolt or screw *l* to the right or left, and the line of deflection of said cams will be immediately increased or decreased. In effecting these changes of position, the cams are made to oscillate on the trunnions projecting from the pivotal blocks C, which blocks are so placed at each end of the machine that they shall always hold the same relative position to each other. The proper position of the part *i* is obtained when the line of the bar *h*, if extended, will pass through the ball-shaped end of the lug *s*, as the latter, in its revolution, comes opposite the end of said bar, accuracy in this particular being necessary, in order that the lags or sectional strips *n* may be always brought around to, and start from, the same point, whatever the angle at which the cams may be set. At this starting-point the sections will have been all drawn together, but not tightly, and at this point will always have precisely the same position relatively to each other.

These changes may be made while the machine is in operation, and the cam at one end may be changed without reference to the other, as may be desired, to meet any irregularities in the manufacture or finish of the goods. The device is thus adapted to the stretching and finishing of coarse nettings and similar grades of goods, the variable textures and diagonal irregularities of the patterns being humored and corrected by means of the adjustability of the parts, as above described. These changes are also made without loss of time or derangement of construction, and are so easily and readily performed that the finest cambrics and coarsest nettings may be successively finished upon the same machine without material interruption.

The construction of the device may be so varied as to have a rotary instead of a stationary shaft, without materially affecting the principle or manner of constructing the adjustable cams aforesaid.

I am aware that the sectional lags *n*, and the manner of linking them together, as well also as the manner of supporting them upon longitudinal bars running between the circular rests *p p*, are all old; but

What I do claim as new, and desire to secure by Letters Patent, is—

1. The combination of the adjustable cam, consisting of the jointed sides *d e*, with the chambered ring *f* arranged upon its periphery, substantially as shown and described.

2. The combination, with the cam *d e*, of the angular stationary arm *g*, bar *h*, and a connection, *l*, whereby the cam may be adjusted to any required angle, in the manner and for the purposes substantially as set forth.

3. The block *i*, arranged to operate in slotted projections upon the cam *d e*, as shown, in combination with the stationary arm *g* and connecting-bar *h*, for the purpose of affording an immovable fulcrum on which the cam may swing in assuming its various positions, substantially as described and shown.

4. The block *m*, arranged to operate in a grooved chamber in the cam, in combination with the arm *g*, and screw *l*, substantially in the manner and for the purposes described.

5. In combination with cam *d e*, adjustable at different angles upon the shaft *a*, the sectional sliding strips *n*, provided with lugs *s*, substantially as described and shown.

CHARLES A. LUTHER.

Witnesses:

THOS. P. BARNEFIELD,

GEO. WALTER BARNEFIELD.