(No Model.) 2 Sheets—Sheet 1.

J. D. TOMLINSON.

MACHINE FOR RAISING THE SURFACE OF TEXTILE FABRICS.

No. 526,421. Patented Sept. 25, 1894.

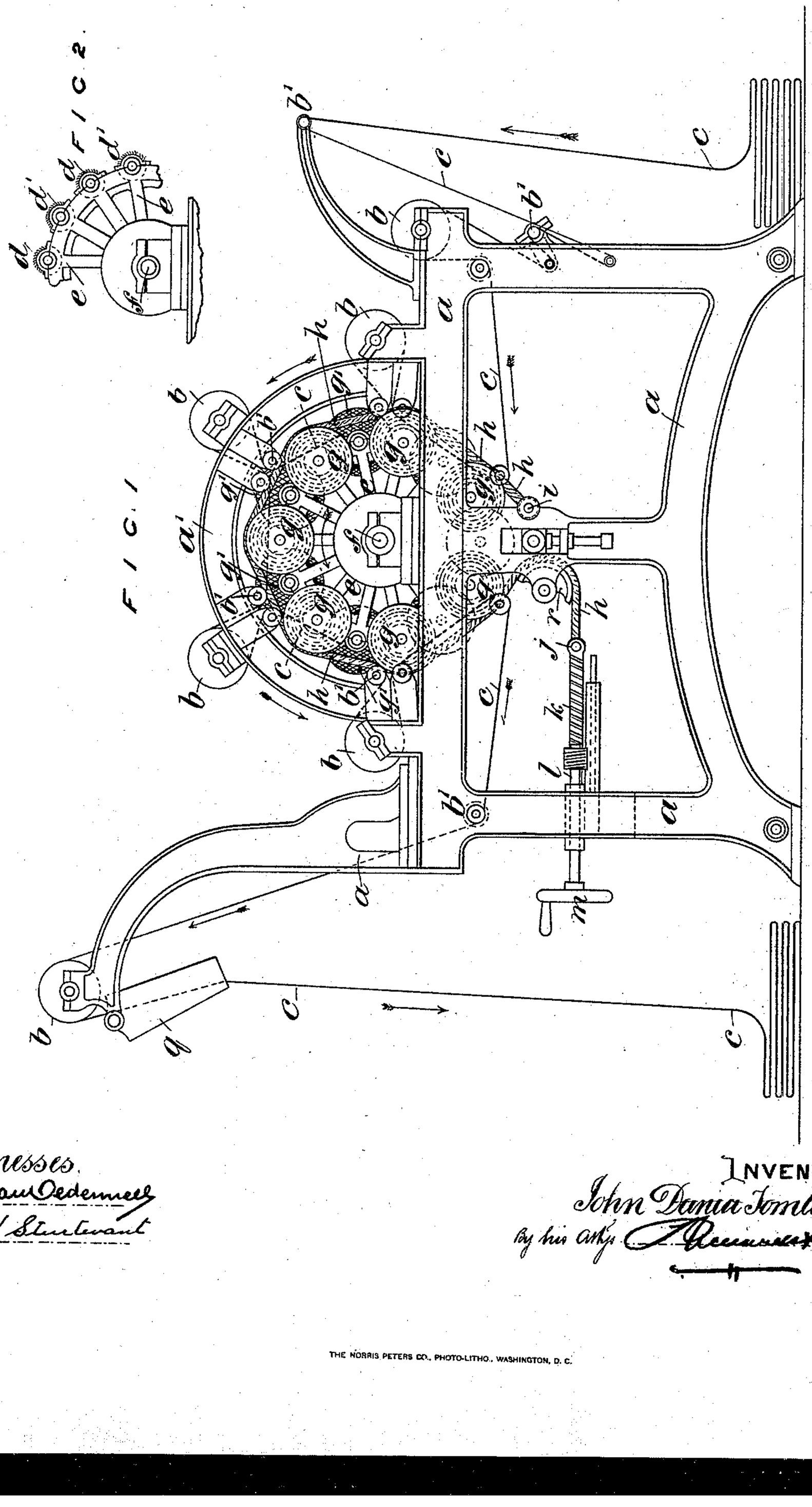

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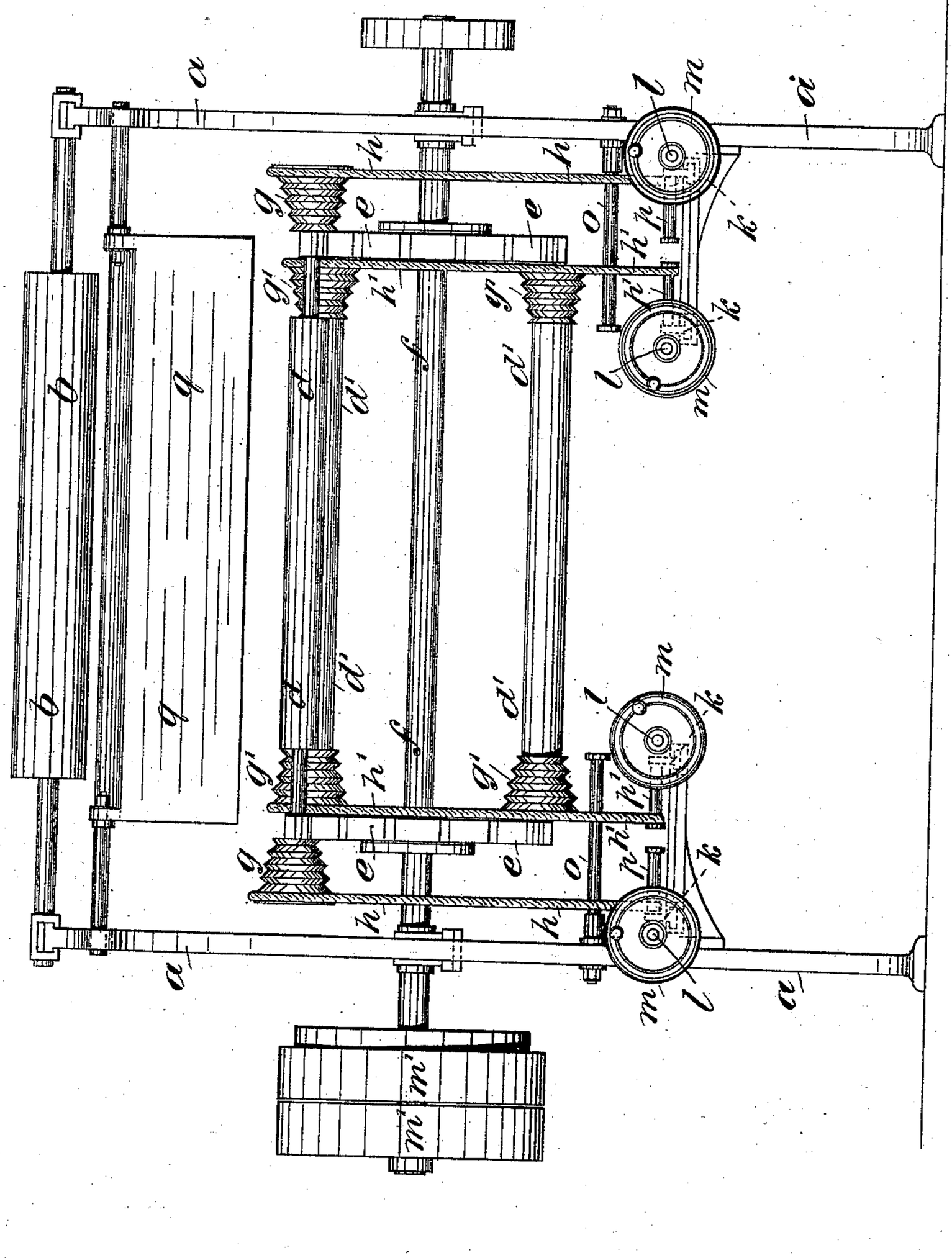
FIG. 3



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UNITED STATES PATENT OFFICE.

JOHN DANIA TOMLINSON, OF ROCHDALE, ENGLAND.

MACHINE FOR RAISING THE SURFACE OF TEXTILE FABRICS.

SPECIFICATION forming part of Letters Patent No. 526,421, dated September 25, 1894.

Application filed June 2, 1894. Serial No. 513,285. (No model.) Patented in England April 6, 1894, No. 6,852.

To all whom it may concern:

Be it known that I, JOHN DANIA TOMLINSON, a subject of the Queen of Great Britain and Ireland, residing at Rochdale, county of Lancaster, England, have invented certain new and useful Improvements in Machines for Raising the Surfaces of Textile Fabrics, of which the following is a specification, and for which a patent has been granted in Great Britain, No. 6,852, of April 6, 1894.

My said invention relates to apparatus for raising a nap upon textile fabrics as is now well understood.

In certain raising machines at present in use, the raising rollers are arranged in a circle or so called "cylinder" and these rollers receive rotary motion, the speed of which can be variably differentiated from the speed of the fabric passing through the machine, these differential velocities being known and determinable. It is to this class of apparatus that my invention is applicable. To obtain the aforesaid differential and determinable velocities of the raising rollers in existing machines, the rollers have been driven by their pulleys being embraced by a belt common to all, which belt also passes partly around a pulley carried on a countershaft. As the cylindrical arrangement or series of raising rollers is caused to revolve, the pulleys of the rollers roll on the embracing belt, and thus by frictional contact the raising rollers are revolved. To vary the speeds, the said embracing belt is caused to move by rotating the pulley and countershaft, and thus while the speed of the fabric remains the same, the speed of the raising rollers can be increased or diminished. The speed of the countershaft is altered by the well known device of shifting a belt on stepped cones mounted on the central and on an auxiliary shaft, which latter communicates by gearing with the countershaft. The object of my invention is to simplify this arrangement by doing away with the said stepped cones, auxiliary shaft, gearing and countershaft, and to substitute therefor a simple arrangement which I will now describe.

Upon the ends of the axis of each raising roller I place a graduated or stepped cone and preferably a grooved cone such as is used for rope or band driving. I then take a band and fasten one end securely to a fixed part of the frame. The band is then passed around or partly around the circle or cylinder represented by the raising cylinder pulleys, and the other end is secured to the eye of an adjusting screw or other tightening means. The result of this arrangement will be that when the cylinder of raising rollers is revolved, the pulleys by their frictional contact with the embracing band will roll thereon and thus rotate the raising cylinders.

To obtain the different speeds, all that is necessary is to shift the band or bands from one step or groove in the pulleys to another and the required determinable and differential speed is at once obtained.

It will be noted that under my invention the embracing band receives no motion at all and the differential and determinable speeds are obtained solely by moving the band from one groove or step in the raising roller pulleys to another. The circumlocutive arrangement existing in present machines is thus obviated and the apparatus greatly simplified.

The annexed two sheets of drawings will render plain the construction and arrangement of my improved raising apparatus.

Figure 1 (Sheet 1) is a side elevation of the apparatus. Fig. 2 (Sheet 1) is a separate view of a portion of the end of the revolving ring carrier which carries the raising rollers. Fig. 3 (Sheet 2) is an elevation of the apparatus at right angles to Fig. 1 and showing the delivery end.

The framing of the machine is marked *a*. The side frames or bends *a'* carry the rollers *b b'* which guide the cloth *c* in the passage over the raising rollers.

The raising rollers are marked *d d'* and they are mounted and revolved in the ring carrier *e* which is carried by the main shaft *f* of the machine. Upon each end of the axle of each raising roller *d* there is fixed a stepped grooved cone pulley *g*, and upon each end of the axle of each raising roller *d'* there is fixed a stepped grooved pulley *g'*. As the raising rollers *d d'* are pitched too closely together to allow the cone pulleys *g g'* to lie in the same circumferential plane, I arrange the said cone pulleys alternately on each side of the ring carriers *e*, as appears most plainly

from Fig. 3 of the drawings. Thus all of the cone pulleys *g* are arranged outside of the ring carriers and all of the cone pulleys *g'* are arranged inside of the ring carriers. I have endeavored to express this in Fig. 1 by cross hatching the cone pulleys *g'* which lie behind the cone pulleys *g* in the said figure. In conjunction with this arrangement of grooved cone pulleys I use bands *h h'* at each end of the ring carrier *e*.

Referring to Fig. 1 it will be seen that one end of the band *h* for example is firmly secured at *i* to the side of the frame *a*. The band is then passed over and around the ring of cone pulleys *g*, occupying the first, second, third, fourth or fifth groove as the case may be in the pulleys. The other end of the band is passed around the segment *r* and secured at *j* to the inner end of a sliding worm rack *k* which slides in a groove as apparent from Figs. 1 and 3, the said rack, gearing with a worm on the end of a spindle *l* provided with a hand-wheel *m*. By turning this hand-wheel and spindle the rack *k* is slid so as to tighten or slacken the band *h* at the pleasure of the operator. The remaining three bands are similarly mounted and operated. It will now be apparent that when the main shaft *f* of the machine is rotated by the agency of the fast and loose pulleys *m'*, *m'* (thereby rotating the ring carrier *e*) the stepped cone pulleys *g g'* are carried round in frictional contact with the bands *h h'*, and as the bands *h h'* do not move, the cone pulleys must and do revolve, the raising rollers operating upon the traveling cloth *c* in the usual manner.

I can adjust the surface speed of the raising rollers *d d'* so as to be equal to, or less or greater than, the surface speed of the cloth *c* and these fixed and determinable speeds are obtained by shifting the bands *h h'* into those grooves in the cone pulleys *g g'* which will give me the desired speed. To provide for this lateral shifting and to bring the points of attachment and adjustment always opposite to the grooves containing the bands, the fixed attachment of the band at *i* is constituted by a stud *o* (see Fig. 3) long enough to take in the depth of both the cone *g* and the cone *g'*. This provides a fixed attachment for both the band *h* and the band *h'*. In shifting the band from one groove to another, the eye of the band is simply slipped along the stud until it rests opposite to the groove to be occupied by the band. Similar projecting studs *p p'* are carried by the worm racks *k* the studs being long enough to cover the depth of the opposite ring of cones only. Therefore in changing the bands from one groove to another groove, the eyes attached to the studs *p p'* can be slipped along the said studs so as to come opposite to the required grooves.

It may be pointed out that by the double arrangement of cones and bands described I could make one half of the raising cylinders revolve at one speed and the remainder at another speed if such differences of speed should be found to be of advantage in treating the cloth. The action of these raising machines is so well known that it is scarcely necessary to describe this.

The cloth *c* is passed in the direction of the arrows through the machine and is guided and passed over the guiding and tightening rollers and means shown, or over such guiding and tightening means as may be found to be necessary. As it is delivered, the cloth is folded by the swing folder *q* in the ordinary manner. The raising rollers, which are covered with card clothing or other suitable raising means, are rotated in the same direction as the traverse of the cloth, and have their speeds determined by the position of the bands in the grooves of the cone pulleys *g g'* the relative speeds corresponding to the different grooves, being known.

It will be evident that stepped cones adapted to receive flat belts might be used instead of the grooved cones and round bands hereinbefore described.

I claim as my invention—

1. In a machine for raising the surface of textile fabrics the combination of the raising rollers, the cone pulleys *g g'* on the axes thereof, the bands passing around the pulleys, one end of the band being fixed, the means for adjusting the other end of the band to adjust the tension, said band being laterally adjustable at both ends to engage different portions of the cone pulleys, substantially as described.

2. In a machine for raising the surface of textile fabrics, the combination of the raising rollers *d*, *d'*, the pulleys *g*, *g'* on the axes thereof, the bands *h*, *h'* passing around the said pulleys, the elongated fixed studs holding one end of the bands and adapted to permit lateral adjustment of the band, the elongated studs at the other ends of the bands adapted also to permit lateral adjustment thereof and the means for carrying and adjusting the last mentioned studs to vary the tension on the bands, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

JOHN DANIA TOMLINSON.

Witnesses:
JOSHUA ENTWISLE,
RICHARD IBBERSON.