(No Model.) 2 Sheets—Sheet 1.

R. W. WATSON.

SPEED REGULATING ATTACHMENT FOR MACHINES FOR MEASURING OR PACKAGING FABRICS.

No. 526,275. Patented Sept. 18, 1894.

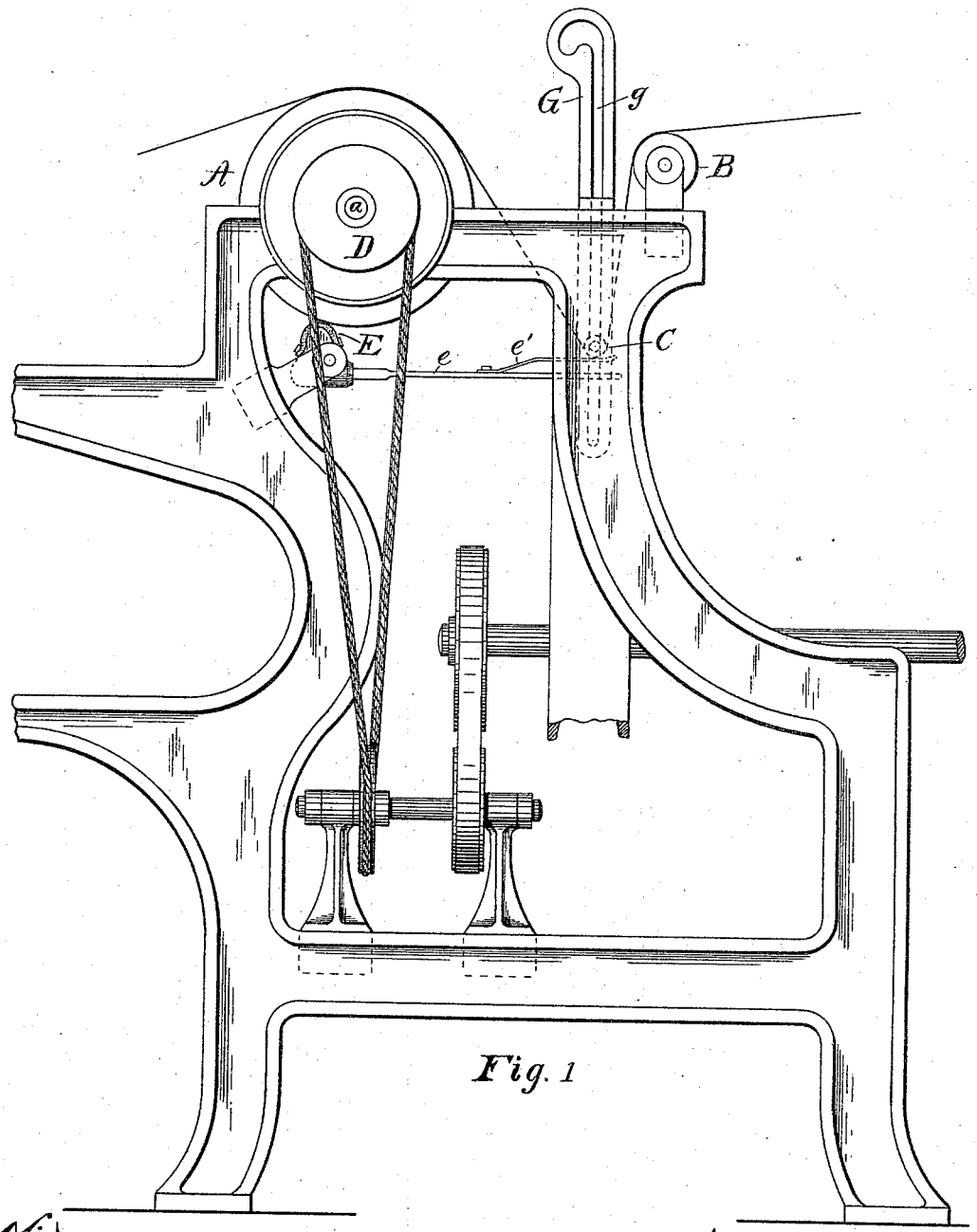

Fig. 1

Witnesses.
H. C. Griswold
Helen M. Wood.

Inventor.
Robert W. Watson
By Wing & Thurston
his attorneys

(No Model.) 2 Sheets—Sheet 2.

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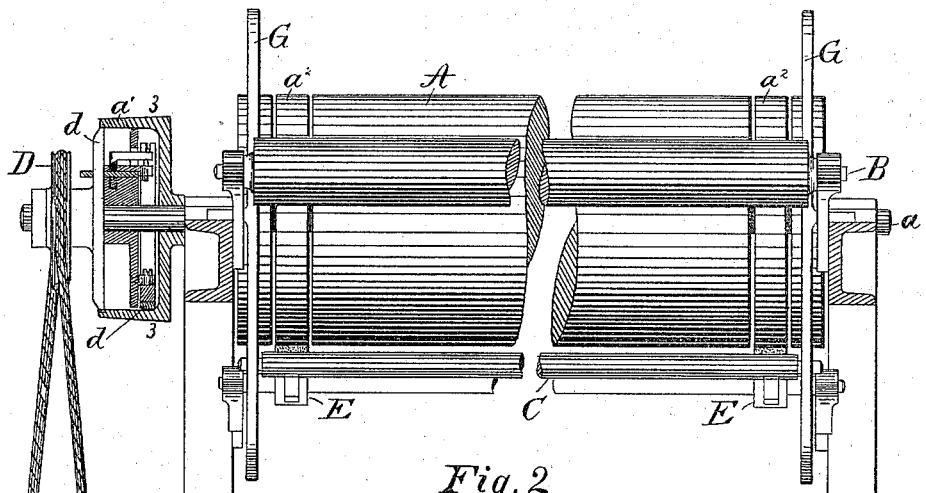

Fig. 2

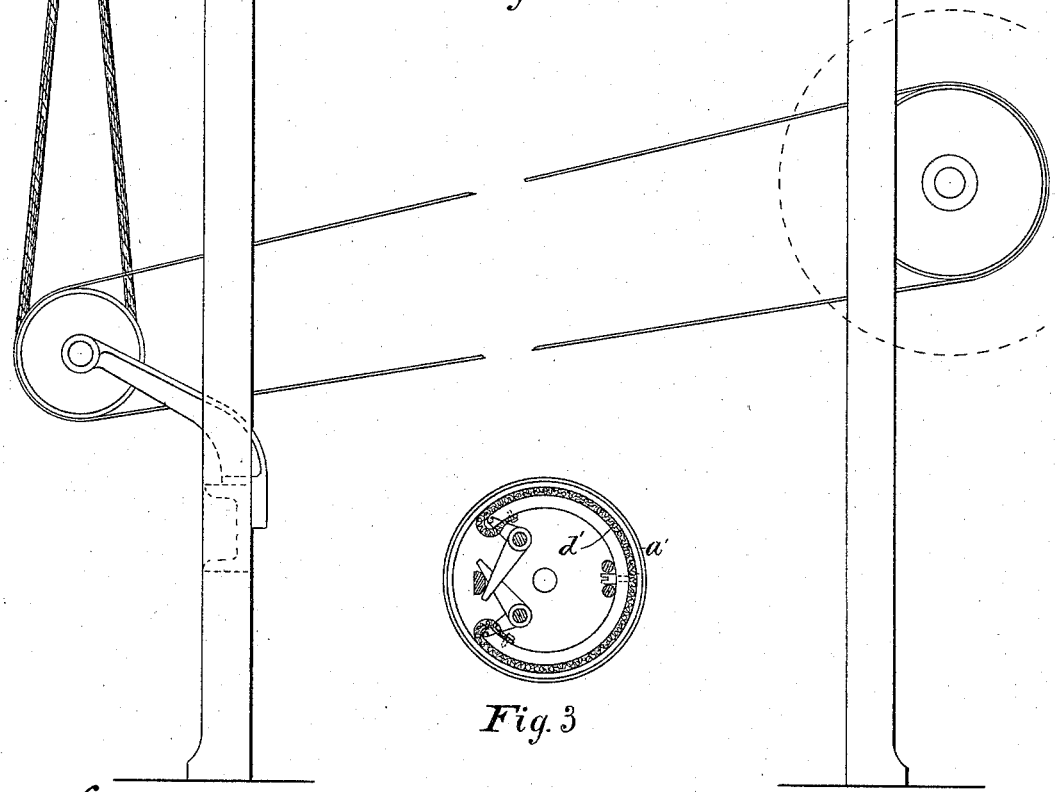

Fig. 3

Witnesses.
A. Griswold.
Helen M. Wood.

Inventor.
Robert W. Watson
By Wing & Thurston
his attorneys

UNITED STATES PATENT OFFICE.

ROBERT W. WATSON, OF PRESTON, ENGLAND.

SPEED-REGULATING ATTACHMENT FOR MACHINES FOR MEASURING OR PACKAGING FABRICS.

SPECIFICATION forming part of Letters Patent No. 526,275, dated September 18, 1894.

Application filed December 1, 1893. Serial No. 492,550. (No model.)

To all whom it may concern:

Be it known that I, ROBERT W. WATSON, a citizen of the United States, residing at Preston, in the county of Lancaster, England, have invented certain new and useful Improvements in Speed-Regulating Attachments for Machines for Measuring or Packaging Fabrics; 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.

The invention is particularly adapted to use in connection with the class of machines which is illustrated in Letters Patent No. 359,583, dated March 15, 1887; and the drawings show a portion of a machine of this class with my improvements applied thereto; but the invention is applicable to numerous other machines through which fabrics are passed for the purpose of measuring them, plicating them, or winding them on a board or roll.

The object of the invention is to regulate the speed of the delivery of the fabric and to equalize the tension on said fabric, whereby the fabric may be drawn away from the point of regulation at a variable speed, without danger of tearing, unduly straining, or unevenly stretching said fabric.

In the drawings Figure 1 is a side elevation of so much of a fabric measuring and packaging machine having my invention applied thereto, as will illustrate said improvement. Fig. 2 is an end view of the same parts and Fig. 3 is a sectional view of the frictional connecting mechanism between the draft roll driven helper pulley and shaft *a*, the section being the plane indicated by line 3—3 of Fig. 2.

In the drawings A represents a cylinder commonly called a draft roll which is secured to a shaft *a* journaled in the frame of the machine.

B represents a guide bar or roller; and C a drop roller which forms a part of the speed regulating device. The fabric passes over the draft roll and guide bar; and beneath the drop roller which is located between these two. The fabric is drawn along after it passes the draft roll, by means of any suitable mechanism and for any desired purpose; as for example, over a plicating frame by two nipper rolls, or by being wound on a board for the purpose of making a salable package,—which mechanisms are well understood in this art. The surface of the draft roll is such that there will be some friction, more or less, between it and the fabric passing over it. The drawing of the cloth through the machine tends to revolve this draft roll, but it is found that when any considerable part of the power necessary to revolve the roll is taken from the moving fabric, the latter is stretched more or less according to the fabric. To avoid this it has heretofore been customary to revolve the roll by means of what is known as a "helper" or helper pulley at the same surface speed, as near as possible, as the speed of the fabric. This result is more or less easy to secure when the fabric is drawn evenly along; but when the tension on the fabric is irregular, as for example, when drawn along by being wound on a board, this result is more difficult; but it is the result which I am able to secure by the combination of parts shown in the drawings. A pulley D is loosely mounted on the shaft of the draft roll; and this pulley is driven by a suitable belt at a speed slightly in excess of the fastest rate at which the shaft *a* would ever be revolved if the draft roll were revolved by the cloth without slippage. There is a frictional connection between the pulley D and the shaft *a*, which may be of any suitable construction, provided it is sufficiently powerful to drive the shaft *a* under ordinary circumstances, but will slip and permit the independent movement of the pulley when the revolution of the shaft is retarded. The friction connection shown consists of a pulley *a'* secured to the shaft, a disk *d* secured to the hub of the pulley D and an adjustable friction ring *d'* carried by the disk and adapted to engage the inner face of the pulley *a'*. Substantially the same friction bearing is herein shown as is shown in Fig. 8 of the prior patent, No. 359,583, hereinbefore mentioned.

Secured to the shaft *a* are two friction brake rings a^2 a^2. Pivoted adjacent to these rings are two brakes E E (preferably having leather faces) which are adapted to engage with the surface of said rings. Each of these brakes has a lever arm *e*, which lies beneath the drop roller C. A spring *e'* is secured to each lever

arm in a position where the roller C, when it descends, will strike the spring rather than the arm. The roller C is vertically movable in suitable guides, as for example, the slots *g* in the vertical plates G.

The operation of the mechanism is as follows: It will be understood that the fabric is being carried through the machine by the tension applied to the fabric by the winding mechanism or whatever mechanism is employed to draw the fabric along, assisted, more or less, by the revolution of the draft roll, and that the slack in the fabric between the draft roll and the guide roll B is taken up by the drop roller. Now, if the tension on the fabric due to the winding mechanism is lessened, the fabric accumulates between the draft roll and the roll B, whereupon the drop roller falls against the brake levers and its weight causes the brakes to be applied to the brake rings. This checks the movement of the shaft *a*, while the pulley D continues its comparatively rapid movement, being permitted to do so by the slipping of the friction connection between it and the shaft. When the movement of the shaft roll is checked, the passage of the fabric over it is retarded, and the slack between the draft roll and the guide roll is thereupon taken up by the winding mechanism. The drop roller is lifted thereby from the brake levers, the pressure of the brakes on the brake rings is relieved and the draft roll again revolves in unison with the helper pulley D. As a matter of fact, when the fabric is being wound on a board, the drop roller moves rapidly up and down on the springs,—never actually leaving them and never resting its entire weight on them, and thus the friction of the brakes is alternately increased and diminished at a rapid rate. It is well to make the springs rather long and not very stiff since thereby the brakes are applied gradually and in a yielding manner so that there is no sudden checking of the movement of the shaft roll. I employ two brakes E E and lever arms for operating them, so that both ends of the drop roller may be checked in their downward motion at the same time. If only one end of the roller engaged with the brake lever the other end of said roller would tend to drop farther, and this uneven action of the roller would cause unequal tension to be applied to the two sides of the fabric, and this would cause the two sides of the fabric to be wound differently upon the board.

Having described my invention, I claim—

1. The combination of a draft roll, a driven helper pulley, and friction driving mechanism connecting said roll and pulley, two cylindrical brake surfaces connected with said roll at the sides thereof, and a guide bar B, with two brakes adapted to engage with said brake surfaces respectively, a lever arm adapted to operate each of said brakes and a guided drop roller adapted to engage at its ends with said lever arms, substantially as and for the purpose specified.

2. The combination of a draft roll, a driven helper pulley, and frictional driving mechanism connecting them, with a cylindrical brake surface rigidly connected with the draft roll, a brake pivoted adjacent thereto having an operating arm, a spring secured to said arm, and a guided drop roller adapted to fall onto said spring, substantially as and for the purpose specified.

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

ROBERT W. WATSON.

Witnesses:

ARTHUR C. HALL,

JOHN W. THOMAS.