G. ROSQUIST.

Web Winding Machine.

No. 232,650. Patented Sept. 28, 1880.

Fig. 1

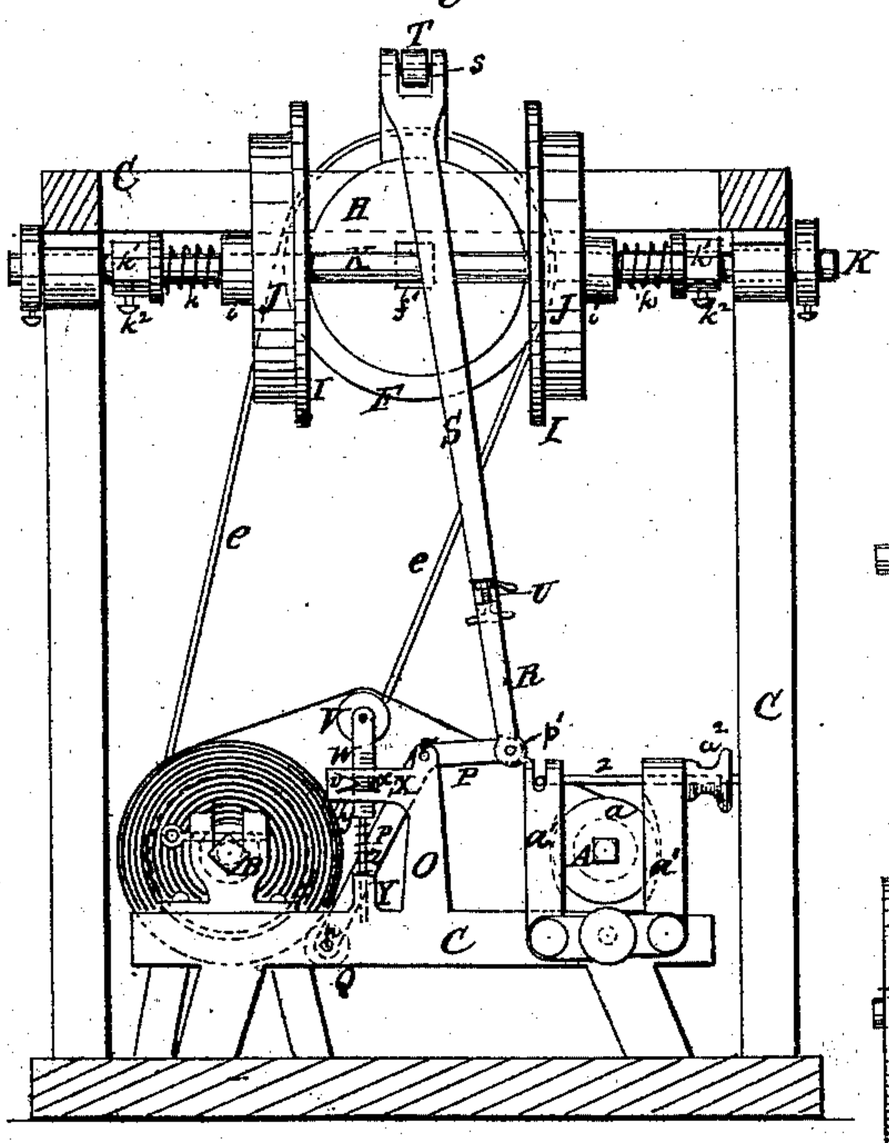

Fig. 2

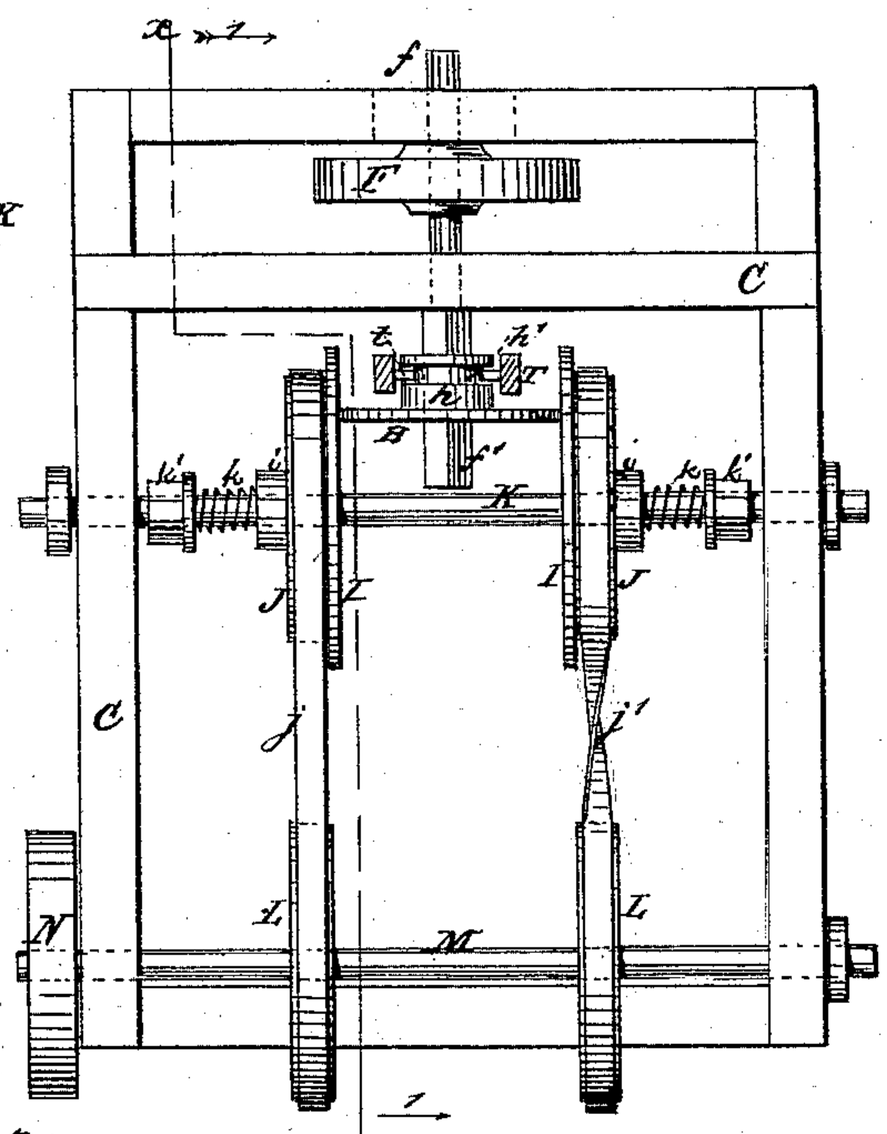

Fig. 3

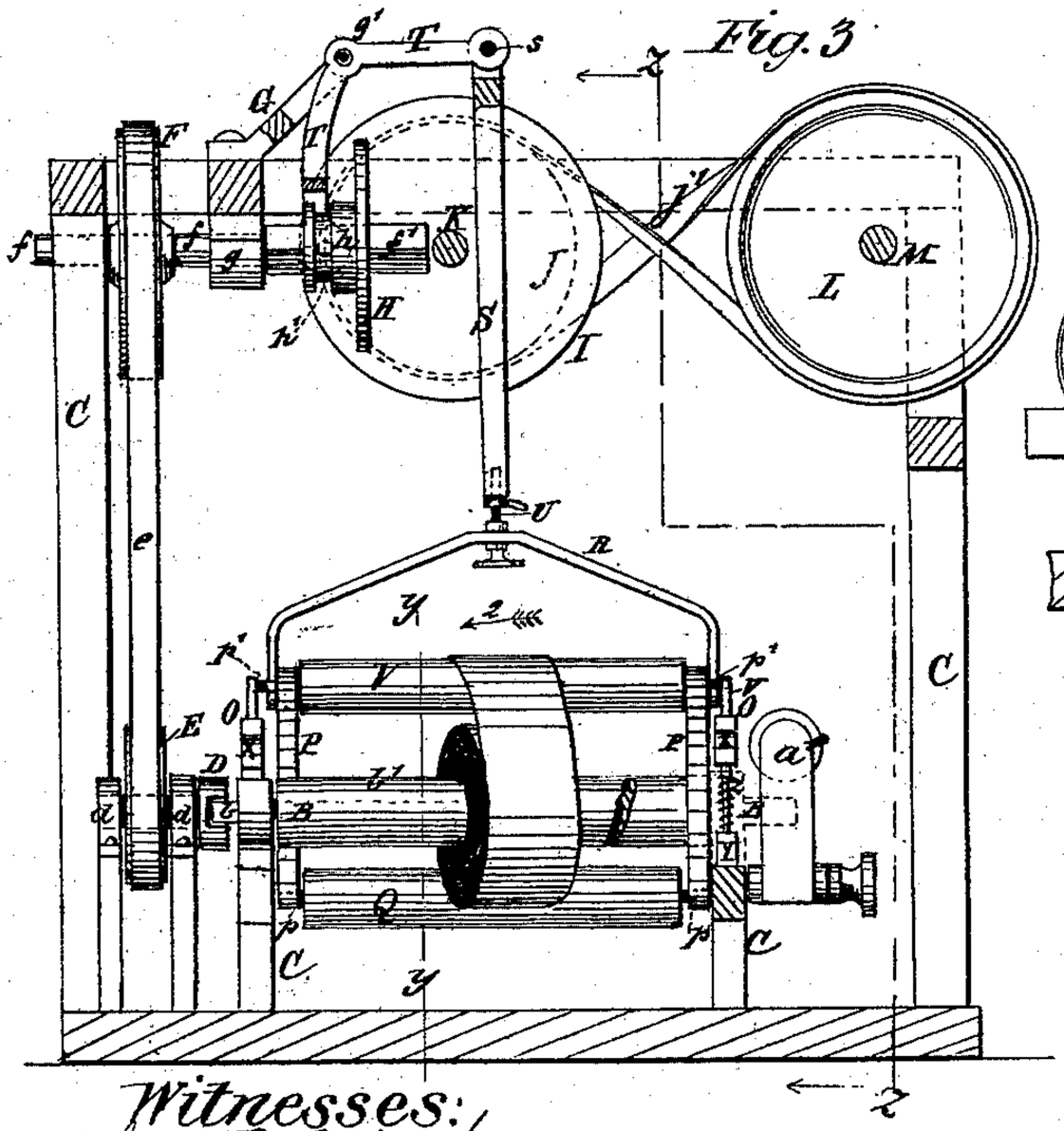

Fig. 4

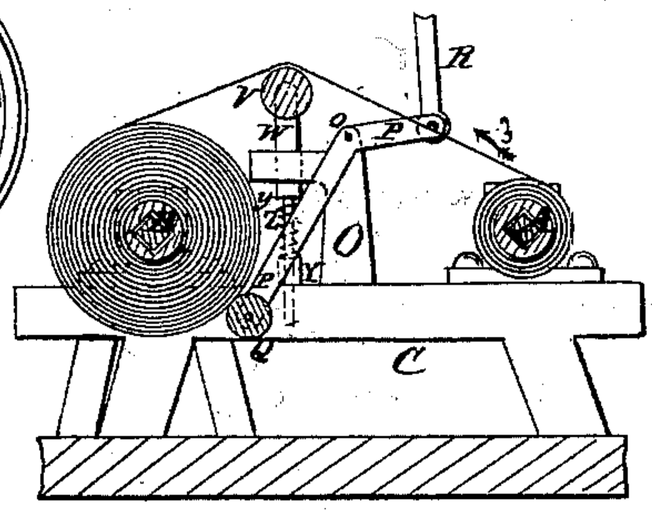

Fig. 5

Witnesses:
Alex F. Roberts,
Sigfrid Lindhagen.

Inventor:
George Rosquist.
By A. W. Almqvist,
Attorney.

UNITED STATES PATENT OFFICE.

GEORGE ROSQUIST, OF BROOKLYN, NEW YORK.

WEB-WINDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 232,650, dated September 28, 1880.

Application filed January 2, 1880.

To all whom it may concern:

Be it known that I, GEORGE ROSQUIST, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Web-Winding Machines, of which the following is a specification.

My invention has for its object to provide an improved mechanical device for use in paper and cotton mills, wall-paper manufactories, newspaper press-rooms, and other establishments where it is necessary or desirable to maintain uniform and invariable surface speed of an endless web of paper or other material while it is being wound onto a spindle, or, in other words, to decrease the speed of the revolving shaft or spindle upon which the web is being wound in exact proportion as the diameter of the roll increases by added coils of the web, and to maintain rotundity of the roll and uniform compactness and tension of the web as the size of the roll is enlarged or diminished in winding onto or off from a revolving spindle.

Probably the best method hitherto known for maintaining even surface speed of an increasing web-roll is that applied to wetting-machines, or such as are used for uniformly dampening long webs of printing-paper for rotary newspaper-presses. In these machines the motion is imparted to the web-roll by friction from the surface of a revolving cylinder. This is liable to the objection that the motor-cylinder, in order to revolve the paper-roll, is constantly dragging the surface-coil of the latter in the direction of the motion, thereby causing the paper to wrinkle and frequently break. The compactness and rotundity of the roll are constantly decreased by added welts of compressed puckers as its diameter increases, and when again unwound on the press to receive the impression from the revolving stereotype-plates repeated breakages of the paper occur, causing waste of time and material, while the wrinkles in the paper blurr the clearness and legibility of the impression.

My invention obviates said objections.

In the accompanying drawings, Figure 1 represents an end elevation, partly in section, on the line *z z* of Fig. 3, of a paper-wetting machine embodying my present invention. Fig. 2 is a top view of the same, showing the operating mechanism with the winding devices omitted. Fig. 3 is a vertical section of the same, taken through the line *x x* of Fig. 2, and seen in direction of arrow 1. Fig. 4 is a detail cross-section through the line *y y* of Fig. 3, seen in direction of arrow 2. Fig. 5 is a sectional detail.

Similar letters of reference indicate like parts in the different figures.

In this invention the frictional motor-cylinder is dispensed with and power applied directly to the spindle or spool on which the web is being wound. The web-roll, as it revolves and increases in size from the winding of the material upon its outer surface, is made to actuate a feed, which gradually, as the material is wound upon the surface of the web-roll, decreases the velocity of its spindle, so as to give a uniform surface motion to the web. The web is wound upon a round wooden spool, having a square axial hole to fit upon a square spindle having journals turned upon its ends, so that the spool and spindle shall revolve together.

The dry roll of paper to be dampened is placed upon the spindle A, which has a smooth-faced end pulley, *a*, revolving in a stationary friction-clamp, *a'*, adjustable by a screw, *z*, and nut a^2, in the usual manner. The web unwinds from the spindle A in the direction of arrow 3, and is wound upon the spindle B by the revolution of the latter, and is acted upon during its passage by a fine downward-pointing spray of water (not shown in the drawings) arranged above the web between the two spindles.

The spindle B revolves in U-shaped end bearings, *c*, so that it may be easily inserted and removed, and is held is place during its revolution by cross-pins *c'* or other suitable device.

The bearings *c* and all other necessary bearings of this machine are attached to any suitable frame-work C, the construction of which may, of course, be varied to adapt it to its several uses.

When the winding-spool *b'* has been pushed on the spindle B the latter, in being placed in the bearings *c*, is simultaneously inserted with one end, *b*, (which is flattened for the purpose,) in a suitable clutch, D, so as to revolve with the said clutch.

The clutch D is formed or attached upon

the end of a shaft mounted in bearings *d*, in axial line with the spindle B, and upon the said shaft is mounted a pulley, E, receiving motion by a belt, *e*, from a pulley, F, secured upon a counter-shaft, *f*, which latter works in bearings *g* and runs parallel with the spindle B.

The shaft *f* is made square for a sufficient length at *f'*, and upon the square portion is fitted to slide the hub *h* of a thin smooth-faced wheel, H, so that the wheel H must revolve with the shaft *f*, and yet can be slid longitudinally upon the shaft *f*. The same result may be accomplished by fitting the hub *h* to slide upon a spline or groove in the shaft *f* instead of upon the square *f'*.

The wheel H is revolved by friction from the surfaces of two circular disks, I, turning in opposite directions in contact with diametrically-opposite points of the face of the wheel H. The hubs *i* of the disks I are mounted to turn upon a stationary shaft, K, whose axis is arranged at right angles to and intersects the extended axis of the shaft *f*.

Upon the hubs *i* of the disks I are formed or attached pulleys J, which receive the motion necessary to revolve the disks I by belts *j j'* from pulleys L, secured upon the main shaft M, to which latter motion is imparted from the engine by a belt over pulley N. In order to cause the disks I to turn in opposite directions, one of the belts, *j'*, is crossed between the pulleys L J.

It is evident that the wheel H may be revolved by only one of the disks I; but the use of two, as shown, is by far more preferable, since it gives more friction with the same power and neutralizes the effect of the lateral pressure upon the shaft *f*.

The amount of friction and gradual loss by wear of the surfaces in contact are regulated and compensated for by spiral or other springs, *k*, arranged upon the shaft K to press endwise upon the hubs *i* toward the center of the wheel H, the tension of the springs being adjusted by nuts or sliding collars *k'*, securable in the adjusted positions upon the shaft by set-screws *k²*.

It is evident that the shorter the friction radius—or, in other words, the nearer to the center of the shaft K the wheel H slides while in contact with the disks I—the slower will be the motion of the spindle B, and vice versa. To maintain a uniform surface speed of the winding web, it is thus only necessary to slide the wheel H toward the shaft K in the same proportion as the size of the paper-roll increases. This I accomplish by the following mechanism: To opposite standards, O, equidistant from the spindle B, are fulcrumed, at *o*, two elbow-levers, P, in whose lower ends are pivoted, at *p*, the journals of a small roller, Q, preferably of the same length as the spool *b'*, which, thus suspended between the ends of the levers P, is arranged with its axis parallel to that of the spindle B, and bears against the surface of the web-roll. The other ends of the levers P are pivoted at *p'* to the ends of a bail, R, which is connected at its middle to one end of a connecting-rod, S, whose other end is pivoted at *s* to one end of a bell-crank lever, T, fulcrumed above the shaft *f*, at *g'*, to lugs on a bracket, G, attached to the frame-work C. The other end of the bell-crank lever T is forked astride the hub *h* of the wheel H, and provided with pins *t*, entering on opposite sides a groove, *h'*, turned in the hub *h*, whereby the latter is reciprocated on the shaft *f* when the lever T is oscillated upon its fulcrum *g'*. Thus for every coil of paper increasing the size of the roll on the spool *b'*, the roller Q is pressed outward from the center of the spool a distance equal to the thickness of the paper, and, by means of the levers P, bail R, connecting-rod S, and lever T, actuates the hub *h*, sliding the wheel H nearer to the center shaft, K, thereby decreasing the speed of the spindle B proportionately as the paper-roll increases in diameter.

In order to adjust the position of the wheel H on the shaft *f* to obtain a greater or less surface speed to suit a web of different material, the bail R and rod S are connected together by a screw, U, swiveled through the bail and screwing into a threaded socket in the rod S, as shown in Fig. 5. The screw U has a hand-wheel, *u*, for operating it, and when adjusted to secure the proper distance between the bail R and the pivot *s* it is kept from accidental turning by the jam-nut *u'* tightening against the end of the rod S. The swiveled end is kept in proper position in the bail R by the collar *u²*, fastened by pin or set-screw *t* upon the shank of the screw U.

In order to form a uniformly-compact roll it is also necessary to apply uniform tension. I have therefore provided the following means for accurately measuring the degree of tension in pounds of pressure: The web, in traveling between the spindles A and B, is made to pass over a roller, V, pivoted between two vertical standards, W, each of which is sliding in a hole in an arm, X, attached to the standard O, and with its lower end in a socket, Y, in the frame C. A spiral spring, Z, upon the rod O, expanding between the frame C and a shoulder, *y*, tends to raise the roller V against the downward pressure caused by the tension of the web.

The standard W is graduated with lines distanced apart according to pounds of compression of the spring Z, and the pressure is read in a small opening, *x*, in the arm X by the juxtaposition of one or other of the division-lines on the scale to a stationary index, *v*; or the scale may be read at the upper or lower edge of the arm X. By the assistance of this gage the clamp *a'* may thus be adjusted to give the same tension to the webs of any number of rolls consecutively operated upon.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a web-winding machine, the combination, with a delivery-roll and a receiving-roll for the web and a yielding tension-roll interposed between them and adapted to rise and fall with the varying tension of the web, and provided with automatic mechanism, substantially as described, for measuring the degree of tension in pounds of pressure, and mechanism, substantially as set forth, for regulating said tension, of automatic mechanism, substantially as described, for varying the velocity of the receiving-roll to substantially equalize the speed of the web as it is unwound from the delivery-roll and wound upon the receiving-roll, substantially as specified.

2. In a web-winding machine, the combination, with a delivery-roll and a receiving-roll for the web and a yielding tension-roll interposed between them and adapted to rise and fall with the varying tension of the web, and provided with automatic mechanism, substantially as described, for measuring the degree of tension in pounds of pressure, of automatic mechanism, substantially as described, for varying the velocity of the receiving-roll to substantially equalize the speed of the web as it is unwound from the delivery-roll and wound upon the receiving-roll, substantially as specified.

3. The combination, with the receiving-roll, connected by suitable means with the operating mechanism, of the wheel H, sliding on the shaft *f*, disks I, turning in opposite directions, bifurcated bell-crank lever T, connecting-rods S, bail R, and elbow-levers P, carrying the roll Q, substantially as described, and for the purpose set forth.

4. The combination, with the shaft M, pulleys L, straight and cross belts *j j'*, shaft K, disks and pulley I J I J, wheel H on shaft *f*, bell-crank lever T, connecting-rod S, bail R, elbow-levers P, carrying the roll Q, pulleys E F, belt *e*, clutch D, and receiving-roll mounted on the spindle B, substantially as described, and for the purpose set forth.

5. The combination, with a receiving-roll having a square axial hole, of the spindle B, having its central part and ends squared, with circular journals near its ends, clutch D, provided with a recess and mounted on the end of a shaft in line with the spindle and U-shaped journal-bearings for the spindle, substantially as described, and for the purpose set forth.

6. The gage-roller V, adapted to be depressed by the passing web, in combination with the graduated spring-pressed sliding standard W and a stationary index, *v*, substantially as described, and for the purpose set forth.

7. The combination, with the receiving-roll connected with the operating mechanism by suitable means, of the wheel H, sliding on the shaft *f*, disks I I, turning in opposite directions, bifurcated bell-crank lever T, connecting-rod S, having a threaded socket in its end, screw U, jam-nut *u'*, collar u^2, bail R, and elbow-levers P, carrying the roll Q, substantially as described, and for the purpose set forth.

8. The gage-roller V, adapted to be depressed by the passing web, in combination with the sliding graduated standards W, index *v*, spindle A, having pulley *a*, friction-clamp *a'*, screw *z*, and nut a^2, substantially as described, and for the purpose set forth.

GEORGE ROSQUIST.

Witnesses:
C. SEDGWICK,
A. W. ALMQVIST.