

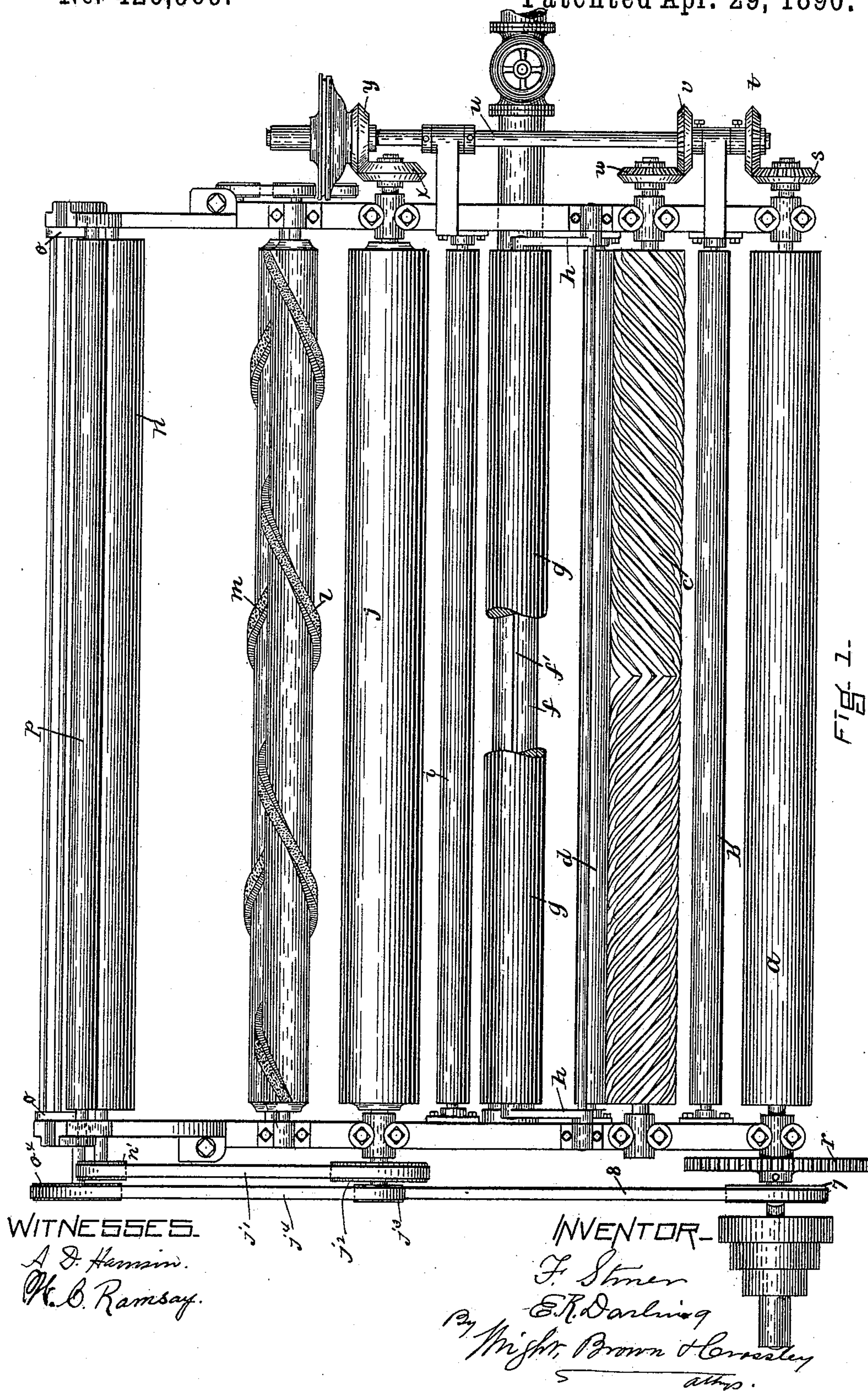
(No Model.)

2 Sheets—Sheet 1.

F. STINER & E. R. DARLING.
MACHINE FOR DRYING FABRICS.

No. 426,969.

Patented Apr. 29, 1890.



2 Sheets—Sheet 2.

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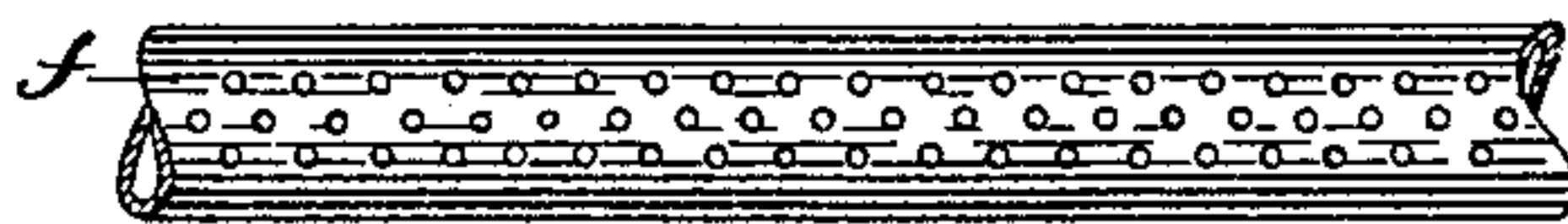


Fig. 4.

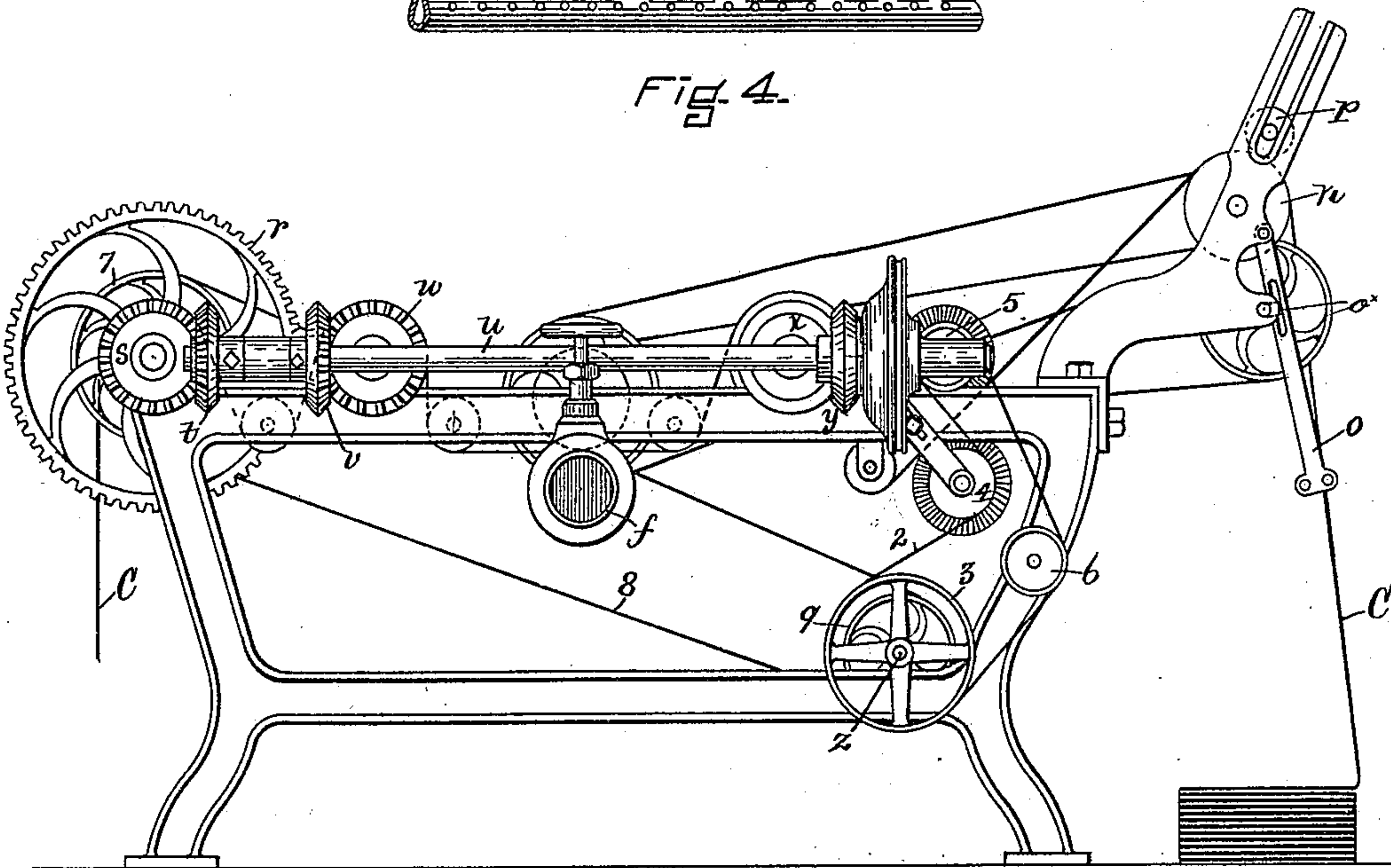


Fig. 3.

WITNESSES.

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131
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UNITED STATES PATENT OFFICE.

FRANK STINER AND ESEK R. DARLING, OF NORTH MONSON, MASSACHUSETTS.

MACHINE FOR DRYING FABRICS.

SPECIFICATION forming part of Letters Patent No. 426,969, dated April 29, 1890.

Application filed July 9, 1888. Serial No. 279,403. (No model.)

To all whom it may concern:

Be it known that we, FRANK STINER and ESEK R. DARLING, of North Monson, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Machines for Drying Fabrics, of which the following is a specification.

Our invention relates to means for extracting water from fabrics, and has for its objects, first, the provision of improvements whereby water may be extracted from fabrics without damage to the colors on the face of the goods resulting from the "bleeding" of the colors in the "backing"—a thing very likely to happen in the use of a centrifugal extractor or squeeze-rolls, particularly when the backing is composed of cheap stock cheaply dyed; second, the provision of improvements whereby the fabric under treatment may be kept from being wrinkled and the nap from becoming "roughed up;" third, the provision of improvements whereby goods which have been treated with acids may have water extracted therefrom without danger of being stained by contact with metals, thereby effecting a material saving in goods; fourth, the provision of improvement whereby the water can be extracted from a piece of goods in much less time than by the commonly-employed centrifugal extractor; and, fifth, the provision of other improvements incidental to the foregoing, whereby important advantages are gained.

To these ends our invention consists of means for drawing or forcing a current of air through the spread or stretched cloth from the right to the wrong side with sufficient force to carry the water with it.

Our invention also consists of a machine for extracting water from cloth provided with means for at the same time keeping the cloth free from wrinkles and brushing and laying the nap on one or both sides.

Our invention also consists of other improvements hereinafter more fully set forth.

For a full and clear understanding of our invention reference is made to the accompanying drawings, forming a part of this specification, of which drawings—

Figure 1 is a top view of our improved ma-

chine, which we term a "pneumatic hydro-extractor," a part being shown as broken out and the pump or exhaust-fan as removed or broken off. Fig. 2 is a view of one side or end of the machine, and Fig. 3 a view of the other side or end. Fig. 4 shows a modified form of a part hereinafter referred to, and Fig. 5 is a diagram of a pump which may be employed in connection with our improvements.

The same letters of reference designate the same parts in all of the views.

A designates the frame of the machine, which is made of suitable form and strength to support the various operative parts.

The cloth C to be treated enters the machine on roller *a*, passing thence under the carrier or tension roller *b*, thence up over the corrugated stretch-roller *c*, by which it is spread or stretched laterally to remove all wrinkles therefrom. From the stretch roller *c* the cloth passes under carrier or tension roller *d*, thence over the pipe or bed *f*, provided on its upper side with a slot *f'*, as best shown in Fig. 1. As the cloth passes over the slotted pipe *f* the water therein is drawn out therefrom from its right side, which may be supposed to be uppermost, down through slot *f'* and out of the pipe *f* by means of a pump P, Fig. 5, or other suitable contrivance connected with pipe *f*.

Instead of employing a slotted pipe *f*, as shown in Fig. 1, we may use a perforated pipe like that shown in Fig. 4. *g* designates a roller journaled in the free ends of arms *h*, the opposite ends of which are pivotally connected with the frame A, which roller *g* rests upon the cloth at the point where it passes over the slotted pipe *f* for the purpose of holding it closely down thereon. From the pipe *f* the cloth passes under the carrier or tension roller *i*, up over the draft-roller *j*, thence down under tension or carrier roller *k*, upward between brushes *l m*, thence over roller *n*, and, finally, down through folder *o* if it is to be folded, or around roller *p* if it is desired to form it into a roll.

The folder *o* may be a frame pivoted at *o'* to the bracket *o''*, which supports the roller *n*, and this folder may have a vibratory motion imparted to it by a crank or other shaft *o'''*;

but the details of the construction of the folder and its operating mechanism are not of the essence of this invention.

Draft-roller *j* is preferably made about one-tenth larger in diameter than the other rollers *a* and *c*, so as that it may have a slightly greater surface-speed, and therefore operate to prevent any slack in the cloth between the point of entrance and said roller *j*.

Brush-roller *m* is made adjustable in its bearings, so that if it is desired not to brush the under or wrong side of the cloth said brush-roller may be moved out of contact therewith. The means shown for effecting such adjustments consists of arms *m'*, in which the roller is journaled, said arms having slots *m²* and pivot-screws *m³*, by which the said arms are secured to the frame *A* and adjusting-screws *m⁴* let into the said frame.

Any suitable equivalent for the pump *P* may be employed, the same being within the scope of this invention.

The machine receives motion from any prime motor rotating shaft *e*, upon which is fixed the gear *q*, engaging gear *r* on the shaft of entering roller *a*, said shaft being provided at its opposite end with a bevel gear-wheel *s*, meshing with a like wheel *t* on a transverse shaft *u*, which shaft *u* is provided at a proper point with a bevel-wheel *v*, engaging a like bevel-wheel *w* on the end of the shaft of stretch-roller *c* and so driving said roller. Draft-roller *j* is driven by means of a friction-gear *x*, engaging a like friction-gear *y* on transverse shaft *u*, so as that if by the continued rotation of draft-roller *j* the cloth should become unduly stretched or strained friction-gears *x y* may slip one upon the other, the rotation of draft-roller *j* being stopped.

The brush-rollers *l m* are driven from shaft *z* by means of a belt or band 2, passing around pulleys 3, 4, and 5 and binder-pulley 6, shaft *z* receiving motion from a pulley 7 on the shaft of entering roller *a* through the medium of belt 8 passing around said pulley 7 and a pulley 9 on shaft *z*. Belt *j'* over pulleys *j²* and *n'* transmits motion to the roller *n*, and belt *j⁴* connects a pulley *j³* on the draft-roller shaft with a pulley *o⁴* on the shaft of the folder-operating mechanism to actuate it.

A number of advantages are gained by our pneumatic hydro-extractor over the commonly-used centrifugal extractors and squeeze-rolls, among which are the ability with our improved machine to treat fabrics having a backing of inferior stock poorly dyed, and which, when wet, would "bleed" badly and so detrimentally affect or change any delicate colors on the face of the goods, giving the face a cloudy or streaked appearance when finished if treated in either a centrifugal extractor or passed between squeeze-rollers caused by the dye or coloring-matter in the backing being forced through to the face, this objection being avoided in our machine by reason of

the fact that the water and any coloring-matter that may be contained therein is drawn through the cloth from the face to and through the backing, leaving the face-colors bright and clear. Again, in the treatment in a centrifugal extractor of goods that have been gigged very wet, said goods are very liable to become greatly wrinkled and to have the nap very badly roughed up, whereas in our improved machine the cloth is stretched and entirely freed from wrinkles before undergoing treatment, and the brushes lay the nap properly, after which the cloth is neatly folded or rolled without the necessity of passing it to a second machine to accomplish these ends. Furthermore, in the treatment in our improved machine of goods that may contain acids of any character, inasmuch as the face of the goods is uppermost, there is no liability of the staining of the same by contact with metal, as so frequently happens in the use of commonly-employed machines, our improved machine in this respect effecting a very material saving in perfect goods. Non-metallic or non-oxidizable rollers may be employed in furtherance of the same object.

By our improved machine we are able to extract the water from a piece of goods in much less time than can be done with a centrifugal extractor, though there are no parts of our improvements run at such a high rate of speed as to endanger life and limb, as is the case in the use of centrifugal machines.

No special foundation is required for our improved machine, since it can be set up on any ordinary mill-floor.

Though we have been particular in our description of the form and arrangement of the various parts of our improved machine as here shown, it is obvious that these may be changed or varied without departing from the nature or spirit of the invention.

Having thus described the nature of our invention and the manner of using it, we would have it understood that what we claim is—

1. In a hydro-extractor for treating cloth, the combination of rollers for introducing the cloth into the machine and drawing it through the same, the slotted or perforated pipe *f*, over which the cloth is passed, a pneumatic apparatus connected with said pipe to pass air through the cloth from its face to its back, and a roller *g*, arranged directly over the open portion of the apertured pipe, substantially as described.

2. In a hydro-extractor for treating cloth, the combination of rollers for introducing the cloth into the machine and drawing it through the same, a roller for stretching the cloth laterally, the slotted or perforated pipe *f*, over which the cloth is passed, a pneumatic apparatus connected with said pipe to pass air through the cloth from its face to its back, and a roller *g*, arranged directly over the open

portion of the apertured pipe, and a brush-roller for laying the nap, substantially as described.

3. In a hydro-extractor for treating cloth,
5 the combination of rollers for introducing the cloth into the machine and drawing it through the same, friction-gearing for actuating the draft-roller, a roller for stretching the cloth laterally, the slotted and perforated pipe *f*,
10 over which the cloth is passed, a pneumatic apparatus connected with said pipe to pass air through the cloth from its face to its back, a roller *g*, arranged directly over the open

portion of the apertured pipe, and a brush-roller for laying the nap, substantially as de- 15 scribed.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, this 29th day of June, A. D. 1888.

FRANK STINER.
ESEK R. DARLING.

Witnesses:

GEORGE H. PARKER,
JOHN A. GRANT.