(No Model.) 3 Sheets—Sheet 1.

F. STINER & E. R. DARLING.

PNEUMATIC DYEING AND WASHING MACHINE.

No. 426,875. Patented Apr. 29, 1890.

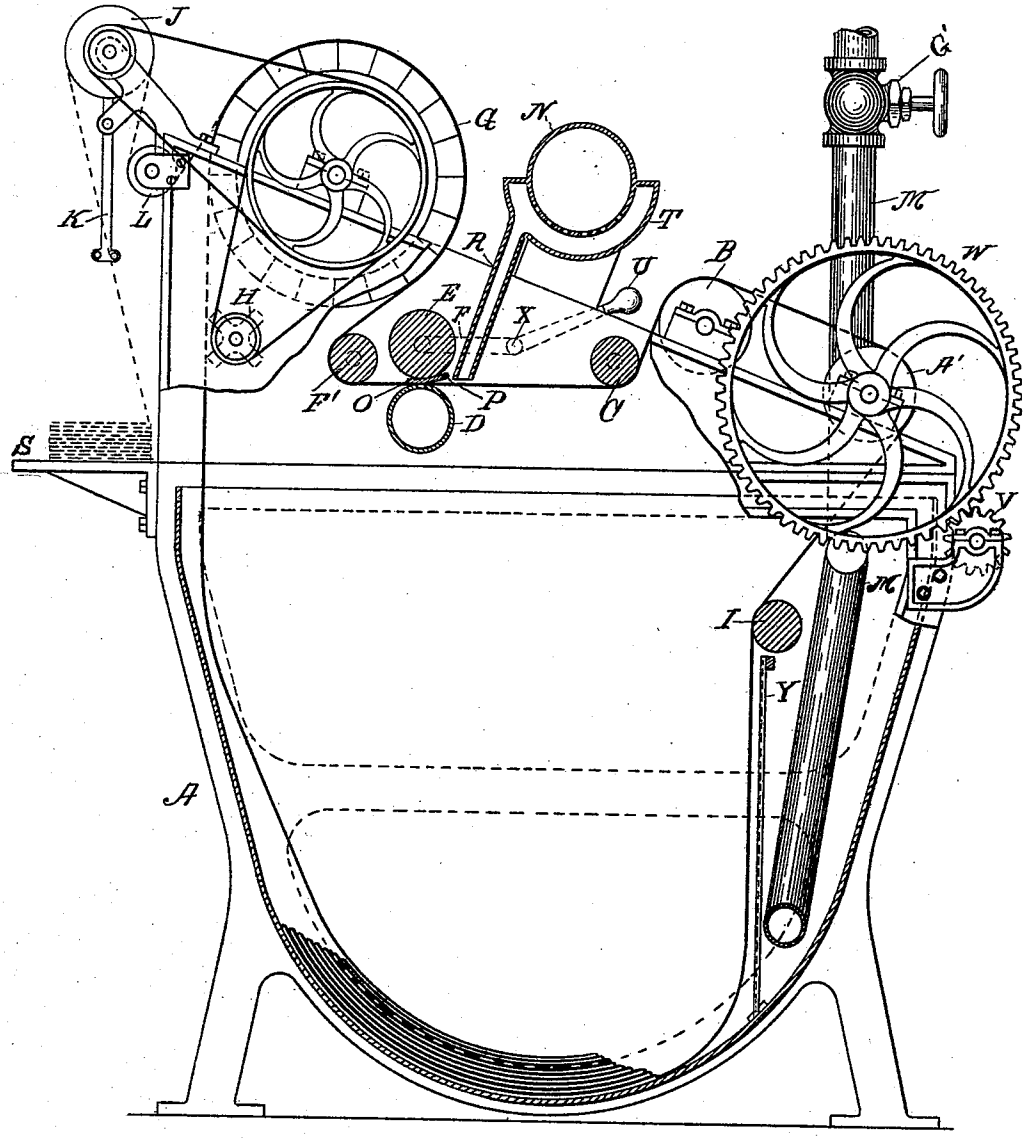


Fig. 1.

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(No Model.) 3 Sheets—Sheet 2.

F. STINER & E. R. DARLING.

PNEUMATIC DYEING AND WASHING MACHINE.

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Fig. 3.

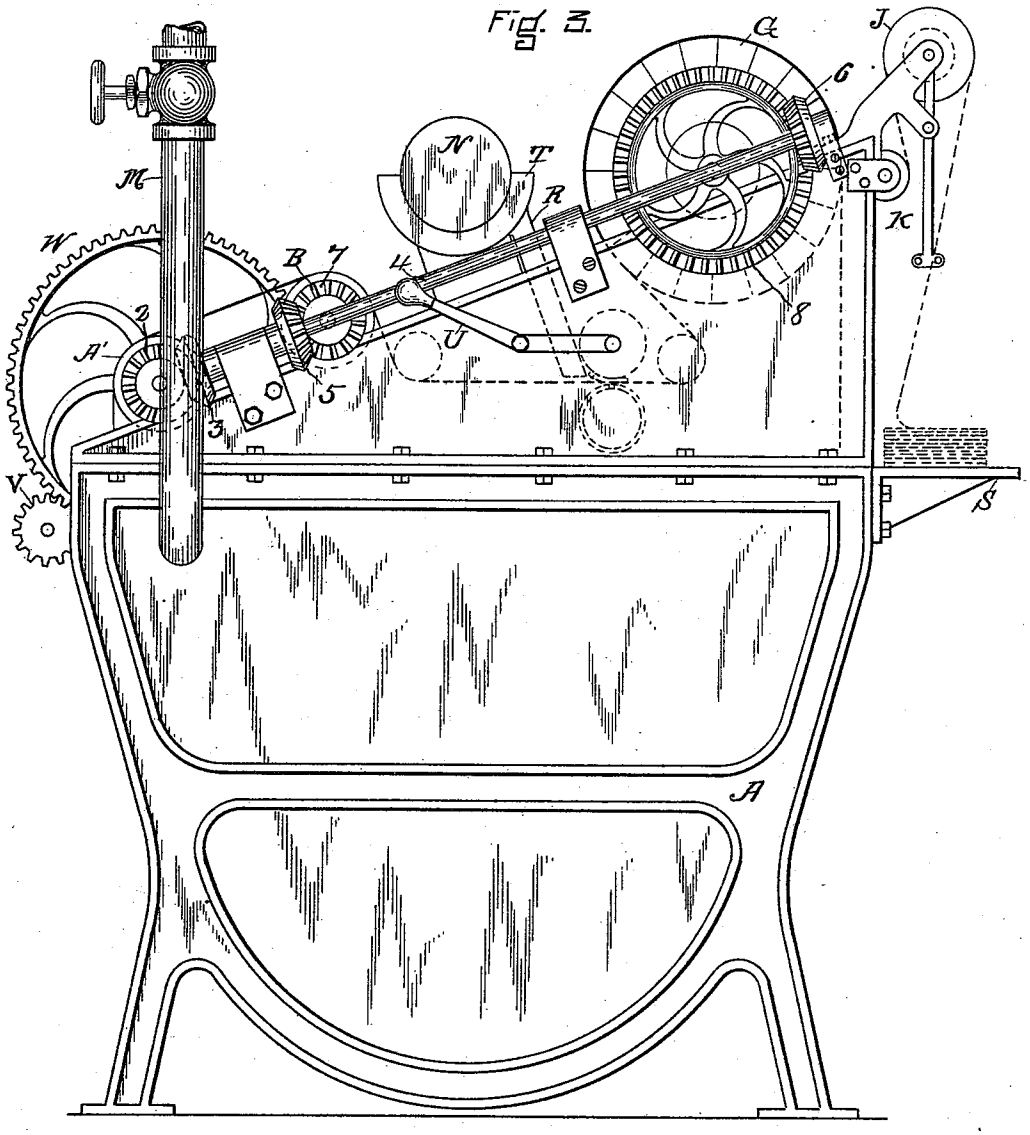


Fig. 2.

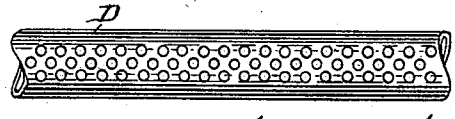


Fig. 4.

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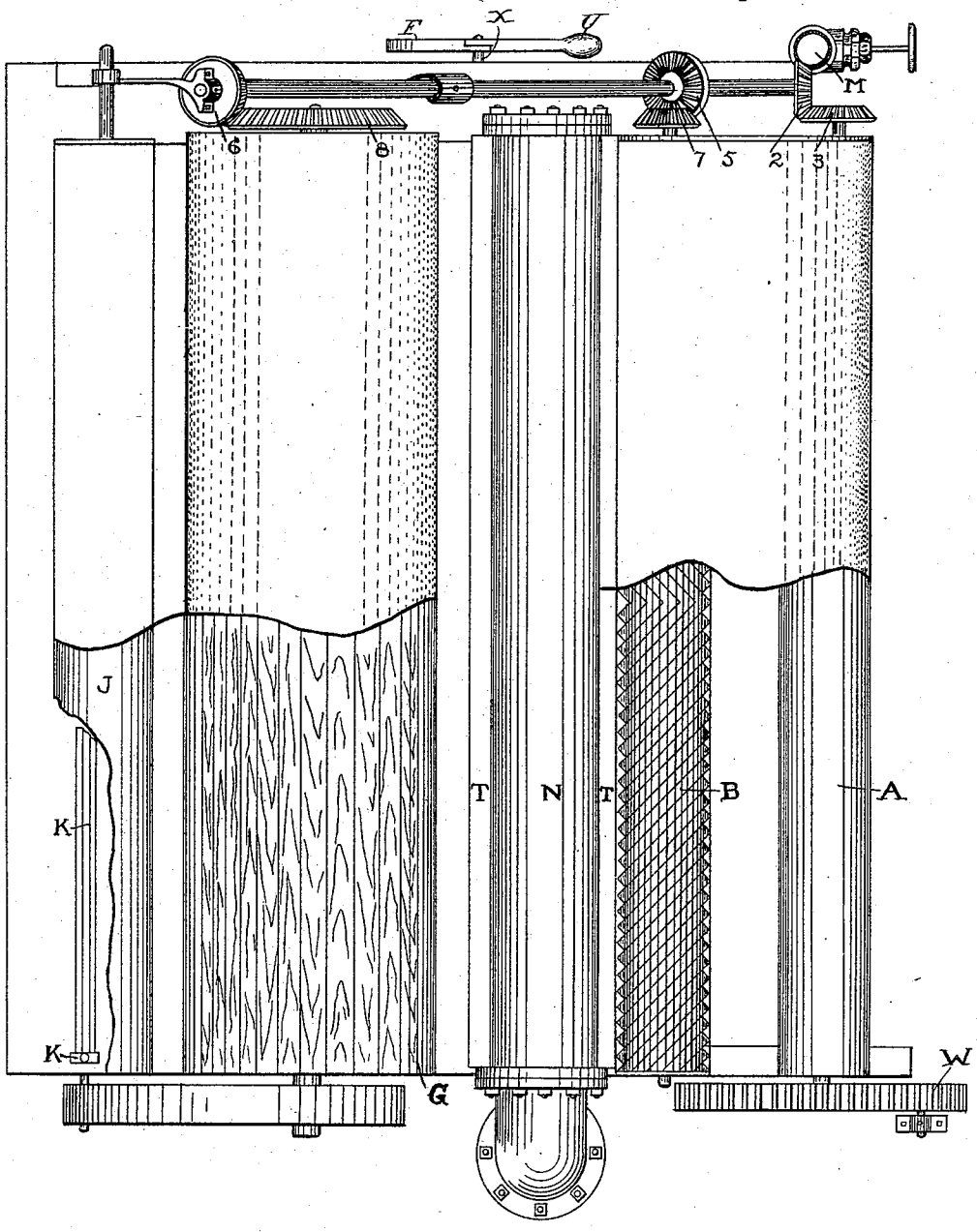


Fig. 3.

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UNITED STATES PATENT OFFICE.

FRANK STINER, OF SPENCER, MASSACHUSETTS, AND ESEK R. DARLING, OF PASCOAG, RHODE ISLAND.

PNEUMATIC DYEING AND WASHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 426,875, dated April 29, 1890.

Application filed August 13, 1888. Serial No. 282,518. (No model.)

To all whom it may concern:

Be it known that we, FRANK STINER, formerly of North Monson, in the county of Hampden, but now of Spencer, in the county of Worcester and State of Massachusetts, and ESEK R. DARLING, also formerly of said North Monson, but now of Pascoag, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Pneumatic Dyeing and Washing Machines, of which the following is a specification.

Our invention relates to means for washing and dyeing fabrics; and it consists of an improved machine whereby the fabric is stretched or spread and the cleansing-liquid or dye is drawn or forced through the cloth by suction or air-current, all as hereinafter more particularly set forth and finally claimed.

Many objections are overcome and advantages gained by our improvements, as will fully appear upon a description of the construction and operation of the machine, for a clear understanding of which reference is made to the accompanying drawings and the letters of reference marked thereon, forming a part of this specification, of which drawings—

Figure 1 is a side elevation, partly in section, of a machine embodying our invention. Fig. 2 is a view of the opposite side of the machine. Fig. 3 is a plan view of apparatus embodying our invention with the cloth and some of the parts broken away. Fig. 4 is a view of a portion of the perforated pipe used in our machine, and hereinafter referred to.

Similar letters of reference designate similar parts or features in all of the figures.

In the drawings, A designates the frame or base of the machine, which is constructed as a substantial tub or vat to contain soap and water or liquid dye, as the case may be, in which the fabric to be treated is immersed when it is led through the machine, entering on the roll A′ and passing to the stretch-roll B, by which it is stretched or spread laterally to free it of wrinkles. From the stretch-roll B it passes under the carrier or guide roll C, and from thence over the perforated or slotted pipe D, a portion of which is shown in Fig. 4.

O designates a non-porous pad supported in position by a rod P on the fabric over pipe D and held firmly down thereon by a roll E, journaled in the free or forward ends of arms F, secured at their opposite ends to the rock-rod X, which latter device is provided with a handle U, by which the roll E may be raised when desired. Air and water may be supplied to and exhausted from the pipe D in any usual and approved manner.

The purpose of the pad O and roll E is to hold the cloth firmly down on the perforated or slotted pipe D, so as to maintain a partial vacuum therein and compel the air sucked or drawn in to pass horizontally or diagonally through the portion of the fabric being operated upon, thus acting upon quite a large area at the same time.

From the roll D the cloth under treatment passes under carrier or guide roll F′, up over draft-roll G, and, if it is to be treated again, down into the liquid in the vat or tub forming the base of the machine, it being understood that where a piece of cloth is to undergo more than one treatment in the machine its ends will be sewed together, so that it may pass round and round through the machine as often as may be desired. Where the cloth is passed from the draft-roll G back into the tub or vat, we prefer to employ the four-armed or beater roll H, which serves to keep the cloth from clinging to the draft-roll G.

I designates a carrier or guide roll, the office of which is to keep the cloth from dragging on the top of the perforated partition Y (shown in dotted lines) in the tub or vat. The object of the partition Y is to prevent the cloth from coming in contact with the heating-pipe M, employed to heat the liquid in the vat, or directly in contact with the dye-stuffs, which may be put into the vat on the side of the partition on which the pipe M is placed, so that the dye will percolate through the partition and meet the cloth evenly and not strike it in mass. The liquids drawn from the cloth through the pipe D by, for example, a suction-pump, particularly if such liquid be dye, may be returned by suitable connections (not shown) through pipe N, which is also perforated on its under side and partially inclosed by a case or trough T, provided with a spout

R, through which the returned liquid may be led down on top of the cloth near the perforated suction-pipe D, to be again drawn through the fabric. It will be understood that case or trough T and spout R extend the entire width of the machine, so that the returned liquid or dye will be evenly distributed across the whole width of the cloth.

As already stated, the mechanism just described for returning the dye may be used, and it is so used, by preference, for economic reasons; but it is obvious that it may be omitted, and hence we have claimed our invention accordingly.

After the cloth is sufficiently washed or dyed the stitches or sewing uniting the ends is cut, and the fabric passes from draft-roll G under carrier-roll L, thence over roll J, and down through folder K onto shelf S, or, if preferred, onto a truck to be carried away.

The machine receives motion from gear V, Fig. 1, which is driven by any suitable prime motor, said gear engaging gear W on one end of the shaft of roll A′, the opposite end of the shaft being provided with a bevel-gear 2, meshing with a like gear 3 on a transverse shaft 4, on which shaft are also bevel-gears 5 and 6, the former connecting with and driving a similar gear 7 on the end of the journal-shaft of roll B, and the latter engaging and driving a large bevel-gear 8 on draft-roll G. Beater-roll H and draft-roll J are driven by means of chain belts from a pulley or pulleys on the shaft of draft-roll G, and folder K is operated by suitable cams or similar devices on roll J or its shaft.

Steam will be admitted to pipe M, as may be desired, for the purpose of heating the liquid in the vat or tub into which the pipe extends, as shown, a cock or valve G′ serving as a means for regulating the degree to which the liquid may be heated.

By the apparatus described the goods are washed evenly, all wrinkles are removed, goods with heavy raised figures may be treated without liability to injure such figures, there is no liability of the goods roping or knotting, "piece" dyeing may be advantageously practiced, inasmuch as the dye may be carried through the cloth time and again, if necessary, to color or dye inside as well as outside, and, finally, the facility of reusing the dyes renders the machine an economic one.

It is obvious that changes may be made in the form and arrangement of parts comprising our machine without departing from the nature or spirit of our invention.

Having thus described our invention, what we claim is—

1. A machine for washing or dyeing cloth, consisting of rotary draft, guide, and stretch rolls for spreading or stretching and drawing and guiding the fabric in and through the machine, a perforated or slotted pipe over which the fabric is adapted to pass, a pad arranged to bear on the fabric passing over said pipe, a suction device for exhausting the air from said pipe and drawing the liquid from the fabric, and a tub or vat from which the fabric is taken, and into which, if need be, it may again descend, substantially as set forth.

2. In a machine for washing and dyeing cloth, the combination of a slotted or perforated pipe from which the air and liquid are sucked, a superposed roller, between which and the pipe the fabric is passed, and a return-pipe N, having a delivery-spout R arranged above the fabric to deposit the return fluid upon the fabric before the fabric reaches the perforated pipe, substantially as described.

3. In a machine for washing or dyeing cloth, the combination of a slotted or perforated pipe, a pad constructed and arranged to rest on said pipe, a roll resting on said pad, and a suction device connected with said slotted or perforated pipe, substantially as set forth.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, this 3d day of August, A. D. 1888.

FRANK STINER.
ESEK R. DARLING.

Witnesses:
CHAS. KOLLER,
H. I. WHITNEY.