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MACHINE FOR FIXING THE THREADS OF FABRICS.

The machine shown in the accompanying engraving is designed to effect one of the principal operations that have to be performed before the dyeing and finishing of cashmere merinos. The object of fixing is to render stable each filament composing the fabric, so as to keep the threads of the warp, like those of the wool, in the position that has been given them in weaving, and to prepare them to undergo the successive operation without the fabrics fraying or breaking. It is a moist finishing performed at a temperature equal to that which the fabrics will again have to withstand. In weaving, the threads of the wool, in crossing those of the warp, assume a wavy form that results solely from the tension that the latter have received. If a thread of the wool be removed from the fabric it will imperceptibly tend to assume its original form. It results from this that if the operations of dyeing were proceeded with before the fabric had been submitted to fixing, the wool threads would become easily displaced and form frays. In the second place, as manufacturers of fabrics size the warp threads so as to give them greater firmness, it is necessary before proceeding to the fixing to remove this dressing, which exists in the proportion of 8 to 10 per cent, and which dissolves in water raised to a temperature of 40° to 50°.

Fixing, then, consists of two very distinct operations: (1) the removal of the sizing, which is done with water heated to 40° or 50°; and (2) fixing, properly so-called, which is performed with water raised in this case to a temperature varying between 70° and 80°.

The new machine under consideration permits of performing the work continuously, and of obtaining a uniform treatment of the fabrics as well as a complete fixing of all

the fibers. It advantageously replaces those old manipulations that were attended with a great expense, due to the manual labor required; for the results there all depended upon the surveillance and the intelligence of the workmen.

The machine consists of two roll-vats, each containing a rotary apparatus that carries rollers designed for receiving the woven pieces. The first vat, which serves for unsizing, is heated to the temperature requisite for dissolving the dressing and gelatine with which the warp threads had been sized. The liquid contained in this vat is quite quickly saturated, and is renewed twice a day. One of the lower cocks serves for emptying the first vat, which is afterward partially filled with liquid from the other one. This transfer of liquid is effected by means of a connecting pipe placed between the two tanks. The remainder of the filling of the first vat is done with ordinary water, to which has been added carbonate of soda to soften it. The water in the second vat is likewise heated to the temperature indicated above; and it is in this vat that the fixing is actually effected.

The rotary apparatus in each vat consists of two wheels mounted upon a common axle, and carrying between them, at their periphery, six rollers for receiving the fabrics. Each of these latter, on winding on the roller arranged for it, passes through a device designed to keep it taut and regular. As soon as one roller is entirely surrounded, the large wheels are caused to move forward a sixth of their circumference by means of handles, thus carrying the full roller into the liquid and presenting an empty one to be wound.

Each of these rollers is furnished at its extremities with small screw-brakes, which prevent the rotation of the axles during the immersion of the fabric in the liquid, and which give a certain tension to the fabric when it is passing from the

first into the second vat, or from the latter to the squeezer. Rotary motion is transmitted to the receiving roller by means of a driving gear, acting progressively, and of a coupling sleeve. These mechanisms also actuate the roller of the second vat, through the medium of an endless chain.

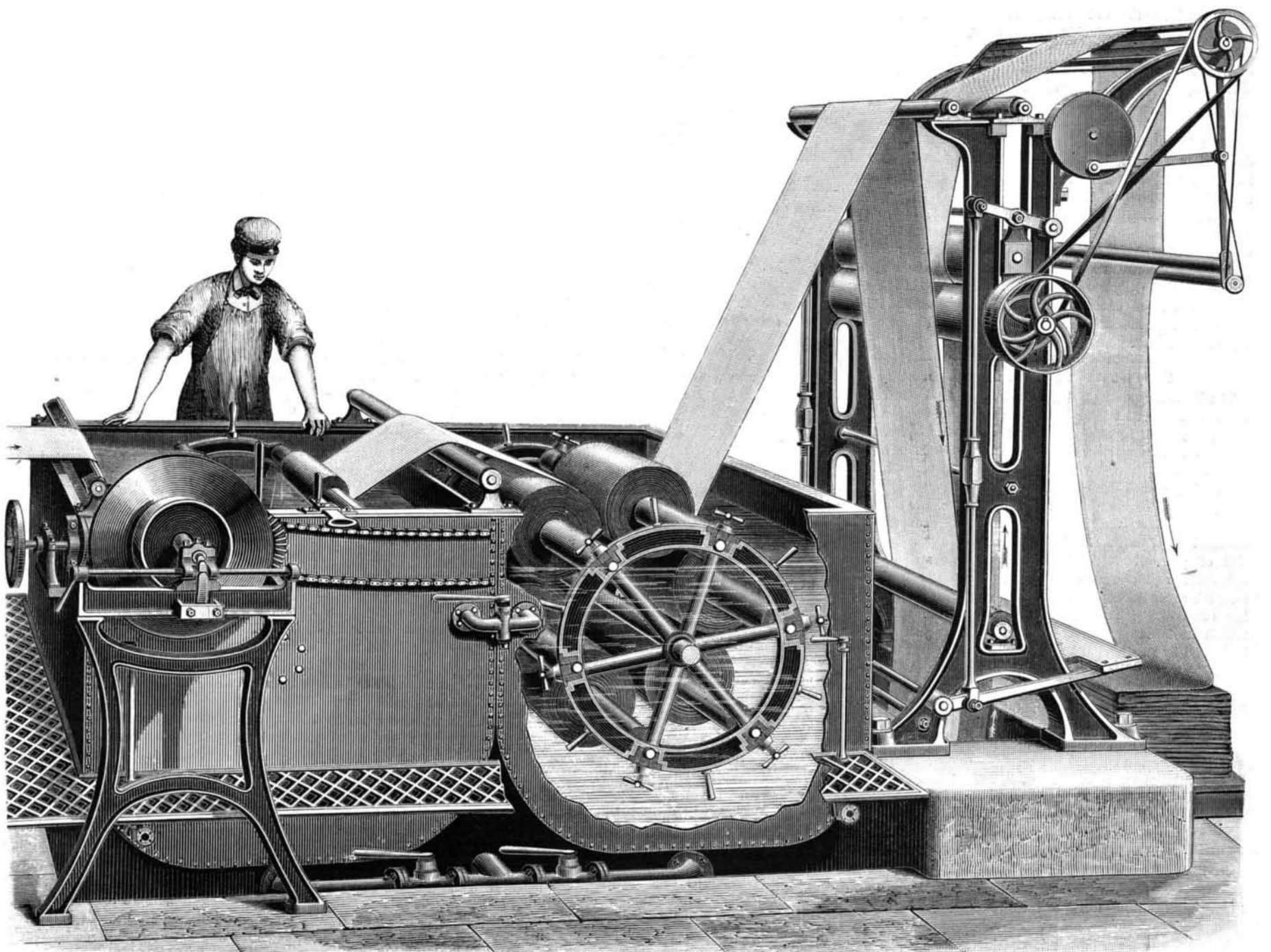
On leaving the first vat, to pass into the second, the fabric passes over a guide-roller, for which there may be substituted a widening bar or a stretching cylinder.

A maneuver similar to the preceding is performed in the second operation; so that, counting five minutes for the winding of a piece, the latter afterward remains for thirty minutes in each of the vats before being carried toward the squeezer.

The rollers are arranged for the reception of two pieces of goods of 100 meters each in length, but experience has shown that it is preferable to treat but one piece at a time. In this way there are prevented any irregularities that might otherwise occur in the selvages.

On its exit from the second vat, each piece descends into a reservoir containing tepid water, and afterward passes between the squeezing rollers of the drying apparatus. One of these rollers has a copper surface and the other is covered with India-rubber. The requisite amount of pressure is given them by means of a pedal at the base, connected by levers with the parts above. It varies according to the nature of the fabrics and the degree of dryness that it is desired to obtain.

When the first piece begins to leave the squeezers, the operation proceeds afterward in a continuous manner. Thus, during the winding of a piece over the roller located in front, the back roller unwinds, and its fabric then winds about the first roller of the next tank. At the same time,



MACHINE FOR FIXING THE THREADS OF FABRICS.

the fabric on the very last roller disengages itself, passes into the reservoir of tepid water, and then goes to the squeezing apparatus.

The mechanical movement of the folding machine draws the fabric on to the table, where it is properly arranged in folds, and from whence it is next taken to undergo the operations of scouring, rinsing, mordanting, and dyeing.

The same machine, arranged with perforated rollers and a pump for the circulation of liquid through the fabric, serves likewise for the ungumming of silks and the rinsing and scouring of cotton and woolen fabrics.—Revue Industrielle.

Hints to Swimmers.

When a swimmer gets chilled the blood ceases to circulate in the fingers, the finger nails become a deathly white color, the lips turn blue, and should he persist in staying in the water after these symptoms develop he is sure to have cramps. So long as the swimmer can discern spots on his finger nails he knows that his blood is in good order, and that he is safe and free from chills.

Albumen in Cows' Milk.

Dr. Schmidt, Mülheim, has been investigating the nitrogenous bodies in cows' milk, about which so much diversity of opinion has hitherto prevailed. He says that three albuminoid substances are regularly present in the milk, viz.: casein, albumen, and pepton.

Sulphocyanide of Barium.

The adulteration of this substance is carried to such a degree that in some French specimens only 80 per cent of the pure salt, Ba(SCN)2.H2O, was found, the impurities consisting largely of barium chloride.

Dr. J. Tscherniac gives the following simple test. The sulphocyanide of barium is completely soluble in absolute alcohol, while all the barium salts that can be profitably employed for adulteration are insoluble in it, or very slightly so.

Remarkable Surgical Operation.

The Paris Academy of Medicine was yesterday informed by the operator that the young man on whom an operation was performed for the extraction of a spoon from his stomach has completely recovered from the effects of the hazardous operation, and is now enjoying his usual health.

The northernmost place in the world where rye and oats mature is at Kengis, in the Swedish province of Norrbotten, forty-nine miles to north of the Polar circle, whereas the northernmost spot where corn is grown is at Muoniovara, ninety-eight miles to north of the circle.

The Bell patent would, it is considered by those competent to form an opinion, be cheap at \$10,000,000. The consolidated telephone interests of the United States are estimated at from \$100,000,000 to \$150,000,000.

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(Illustrated articles are marked with an asterisk.)

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No. 356,

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Table listing contents of the supplement under categories: I. ENGINEERING AND MECHANICS, II. TECHNOLOGY AND CHEMISTRY, III. ELECTRICITY, ETC., IV. ASTRONOMY, V. HYGIENE AND MEDICINE, VI. GEOGRAPHY, VII. ENTOMOLOGY, VIII. MISCELLANEOUS.

THE PAST YEAR'S WORK IN THE PATENT OFFICE.

The report of the work of the Patent Office for the fiscal year ended June 30, 1882, just submitted by Commissioner Marble, shows that there were received 27,622 applications for patents for new inventions; 854 for design patents; 407 for reissue patents; 737 for registration of trade-marks, and 442 for labels, a total of 30,062.

The abridgment of United States patents was discontinued August 1 for lack of appropriations. The Commissioner asks that legislative action be taken to authorize the office to compel the attendance of witnesses to testify as to the use or sale of any invention before the two years' limit, when an application for a patent therefor is pending.

THE GARFIELD MONUMENT EXHIBITION.

Last summer Congress gave the Society of the Army of the Cumberland permission to use the rotunda and adjacent halls of the United States Capitol from November 25 to December 3, for a bazaar and reception, for the purpose of raising funds to aid in the erection of a monument in Washington to the memory of the late President Garfield.

The propriety of making a show house of the national capitol may be questioned; but since it has been allowed, it is to be hoped that the exhibition will be as commendable as its object and worthy of its unparalleled housing.

The Board of Directors comprises representatives of the executive, legislative, and judicial branches of the Government, the army and navy, the Society of the Army of the Cumberland and the citizens of the District of Columbia, assisted by State boards of commissioners.

The exceptional conditions under which the National Bazaar, Industrial and Art Exposition is to be held would seem to make especially inviting the opportunity offered to manufacturers and others to exhibit their wares.

QUEER DOINGS IN OIL.

The summer of 1882 must pass into history as having witnessed the most memorable doings in the annals of the petroleum trade of Pennsylvania. In the SCIENTIFIC AMERICAN for July 22, 1882, reference was made to the results which followed the opening, in May, of the new oil deposits in Warren county, Pennsylvania.

Early in September, after the best wells had been "shot" by torpedoes repeatedly, they suddenly ceased producing in a way that caused a revulsion of feeling and intense excitement among all interested in producing petroleum.