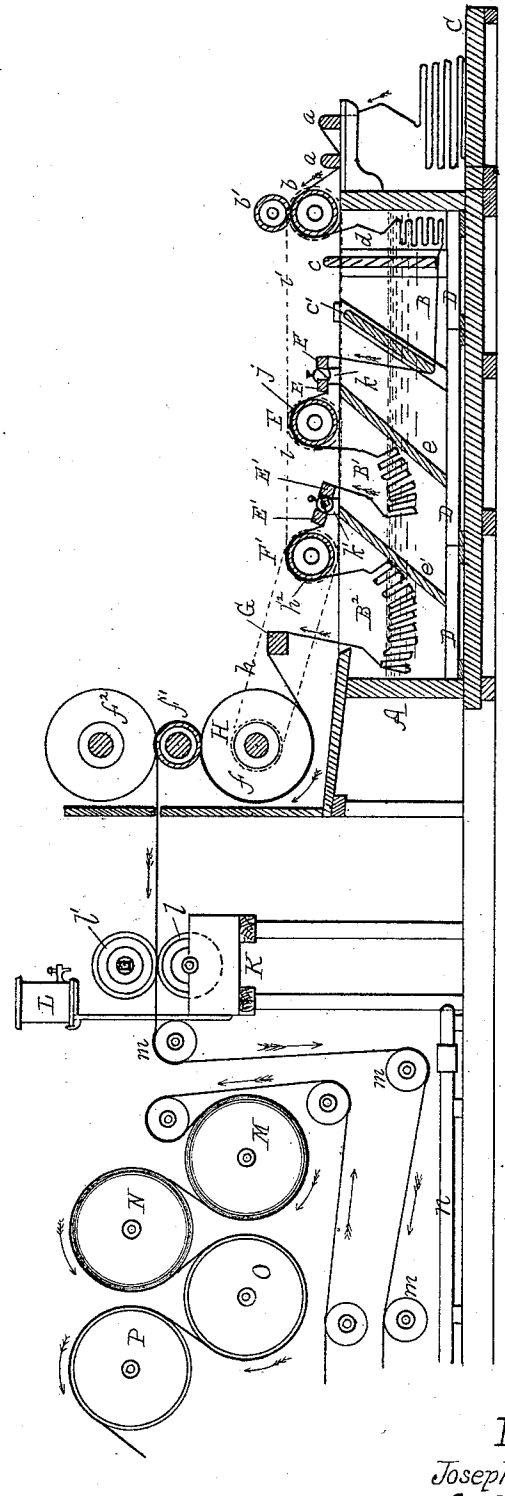
(No Model.) 2 Sheets—Sheet 1.

J. H. RILEY.

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No. 300,010. Patented June 10, 1884.

Fig. 1.



Witnesses.
A. F. Hayden.
H. E. Lodge.

Inventor
Joseph H. Riley.
F. Curtis. Atty.

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.) 2 Sheets—Sheet 2.

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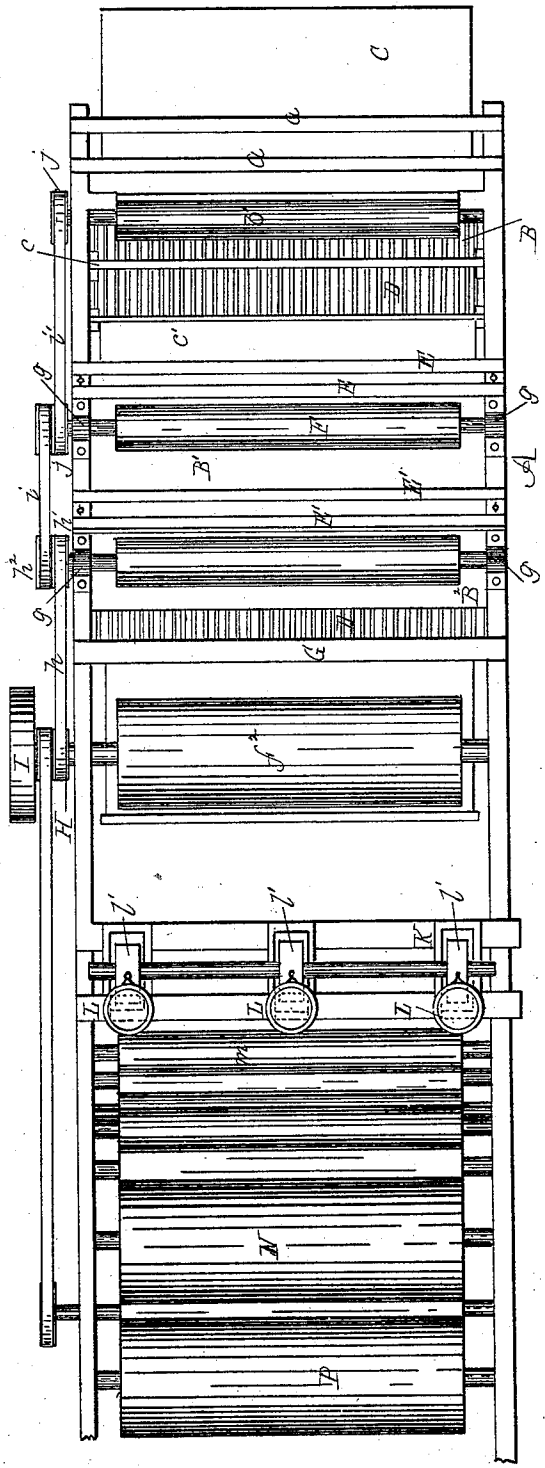


Fig. 2.

Witnesses.
A. F. Hayden.
H. C. Lodge.

Inventor.
Joseph H. Riley.
H. Curtis-Attʼy

N. PETERS. Photo-Lithographer. Washington, D. C.

UNITED STATES PATENT OFFICE.

JOSEPH HACKING RILEY, OF BURY, COUNTY OF LANCASTER, ENGLAND.

APPARATUS FOR SEPARATING VEGETABLE FIBER FROM WOOLEN FABRICS.

SPECIFICATION forming part of Letters Patent No. 300,010, dated June 10, 1884.

Application filed January 11, 1884. (No model.) Patented in England April 16, 1881, No. 1,678.

To all whom it may concern:

Be it known that I, JOSEPH HACKING RILEY, a subject of the Queen of Great Britain, residing at Bury, in the county of Lancaster, England, have invented certain new and useful Improvements in Machinery for Extracting Vegetable Matter from Woolen and Worsted Fabrics and Felted Goods; 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, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

This invention may be considered as improvements on English Letters Patent issued to me April 16, 1881, numbered 1,678, and relates to an improved method of treating fabrics containing wool, worsted, or other animal materials, with a view to the removal of the vegetable matter which may be incorporated therewith; and it consists in an arrangement of mechanism, to be more fully hereinafter explained, whereby the material is more effectually and expeditiously treated than heretofore.

The drawings accompanying this specification represent, in Figure 1, a vertical longitudinal section, and Fig. 2 a plan, of a machine designed to be used for the purposes of my invention.

In these drawings, A represents a tank or cistern to be divided into compartments B B′, &c., by means of partitions *e e′*, &c., which extend nearly to the bottom of the tank, and may be made either larger or smaller, according to the quantity of cloth to be treated. Into this cistern is put the chemical mixture to be used for destroying the vegetable matter in the woolen cloth or fabrics to be treated in conjunction with the squeezing and drying part of the apparatus, to be hereinafter more fully described.

The liquor is made of any strength deemed most advisable by the operator employing this process, and is to be maintained at the level shown in the drawings, or thereabout. The cloth or material to be treated is laid on a suitable low frame, C, and one end passed over and under the wood rails or bars *a a*, and into the nip formed by the rolls *b b′*, thence into the first division, B, of the tank A. The sub-tank B contains two slides, one, *c*, vertical, and one, *c′*, disposed at an angle. These slides move freely up and down. They do not touch the bottom of the tank, being maintained four or five inches therefrom. On the bottom of the tank are disposed open wooden grids or grates D D, &c., suitably fastened down. These grids are so arranged that there may be room for any sediment to accumulate between the times of cleaning out the tank and yet prevent the cloth from coming in contact with the sediment that may collect on the bottom and being soiled thereby. From the front portion, *d*, of the compartment B the cloth is brought under the slides *c c′* before mentioned, and taken through the two stretching or tension bars E E over the draft-roll F, then down on the sloping board where it is allowed to accumulate, as shown in the drawings. From thence it is taken to the next pair of tension-bars, E′ E′, over the roll F′, and into the next compartment or division, where a second accumulation of cloth takes place, as in the last-described division. The divisions *e e′* extend only to the surface of the grids D D, &c. This is to permit of free circulation and also maintain the liquor at the same level throughout the entire tank A. The cloth is carried from the last tank, B², over the straight bar G, and through the rolls *f f′ f²*. The center roll, *f′*, is metal, the upper, *f²*, and lower, *f*, are of wood.

In order to operate and induce proper movement of the cloth to be treated through the tank A in the manner above described, I provide the following mechanism: The rollers *d′*, F, and F′ are mounted in suitable standards, *g g*, as likewise *f f′ f²*. Upon the shaft bearing the roll *f*, I fix a wheel, H, adapted to gear with an endless chain, *h*, which gears with a similar wheel, *h′*, mounted on the shaft bearing the roll F′. A second wheel, *h²*, is mounted on this same shaft, and gears with the driving-chains *i i′*, which connect and gear with the wheels *j j*, respectively on the shafts of the rolls F *b′*. Hence when the wheel H is caused to move by means of suitable power applied to the primary spur-wheel I, the roll *f*, and with it the roll F′ F and *b′*, is likewise caused

to revolve in unison and in the same direction, also the rolls $f' f^2$.

In lieu of the use of the above-mentioned device, motion may be imparted by means of a side shaft and bevel-gearing, or of worms and worm-wheels, or by any other suitable mechanism.

The two pairs of tension-bars E E and E' E' are connected together at the ends by means of cross-pieces, which are provided with trunnions and mounted in suitable standards, $k k'$. The tension is to be increased or diminished by rotating the combination in one direction or the other, a thumb-screw or suitable device being employed to retain the bars in the adjusted position; but any other suitable tension apparatus may be substituted for the device here shown. I find in practice that the tension exerted on the cloth against the bars E E', &c., serves to drive out a portion of the liquid absorbed by it, and when it descends into the next compartment it is in a partially-squeezed state, ready to absorb fresh liquid as it enters it. From the rollers above described the cloth passes through an apparatus for saving the lists or selvages of the cloth when the same contains or is mixed with other vegetable matter and it is desired to save the same from the action of the chemical in the tank A.

K is an oblong wooden box or boxes suitably mounted across the machine, as shown in Fig. 2. In this box is placed the neutralizing-liquor, and over it are arranged two or more pairs of narrow wooden rolls, $l l'$, &c., and between these two rolls—a pair of each being placed on each side of the machine, according to the width of the cloth—the selvages are passed. These rolls $l l'$, &c., are covered with a thick woolen or other suitable pad about one-fourth inch thick and of the width of the selvage to be saved and protected. The cloth may be guided by hand, but generally by suitable mechanical means. The lower roll or rolls, l, run in the neutralizing-liquor contained in the tank K and deposit it on the selvages, assisted by the dripping of the same liquid from the cans or reservoirs L L, &c. These upper rolls, $l' l'$, may be driven by a central shaft and secured thereto by set-screws; hence an extra pair of rolls can be fixed in the center of the shaft and between the two outside pair of rolls. Consequently a selvage in the center of a piece of cloth can be saved in the same manner as those at the sides. This would apply to such fabrics as "doeskins," which are woven with a central selvage, and after finishing are split down the center by this operation, forming two complete pieces of cloth, the central selvage being wider than the outside ones. From here the cloth is passed downward, as shown by the arrows, onto guide-rolls $m m$, &c., into a chamber heated by steam-pipes $n n$, arranged under the drying-cylinders M N O P. The cylinders M N are covered with stout woolen covers in order to graduate the heat to the fabric under operation. The cylinders are suitably mounted, supplied with steam at low pressure—say ten pounds or less—and driven by suitable mechanism exactly at the same speed at which the cloth is passed into the compartment B of the vat A. There is consequently no irregular pulling of the cloth, but a steady movement of the cloth is thus insured.

To permit proper action of the liquid in the tank A upon the material to be treated the fabric is passed through the rolls $b b'$, and into the compartment d, where it is allowed to accumulate before the end is fed to the second roll, F; and this accumulation depends upon the strength of the liquid in the tanks, as if it were strong less time would be required for the immersion of the cloth, and hence less accumulation desired. With this combination of indirect heat from the steam-pipes and direct or contact heat afterward from the drying-cylinders, I find the best result is obtained; but if the cloth under operation is wool-dyed, and the colors are somewhat delicate, I dry the cloth in a hot-air chamber and without contact with metallic surfaces at all. When the cloth is received from the above-described apparatus in a dry state, it is made to pass through a pair of swift running rolls covered with card clothing, bristles, or other suitable material, which brush both sides of the cloth at once, and take off the burr or spile that may be loose on the surface and previously destroyed by the machine.

The operation of the machine containing my improvements is as follows: Suppose the fabric to be treated placed on the movable frame. One end is passed between the tension-bars $a a$ over the roll b, and thence into the secondary vat d. Here it is allowed to accumulate sufficiently to permit a proper action of the liquid contained therein upon the vegetable matter in the cloth. The end is then led under the partitions $c c'$, and up between the tension-bars E E, the passage between these bars driving out a certain portion of the liquid. The cloth is then fed over the roll F and into the compartment B'. It must be understood that the drag caused by the tension-bars must not be too much, otherwise it will overcome the friction between the wet cloth and the roller, over which it is passing, and the cloth will cease to feed and remain stationary. I have dispensed with the top rollers, so that the fabric will bring over from the last compartment of the tank a larger amount of liquor than would otherwise be possible if it run between a pair of rolls, thus causing a lot of liquid to be squeezed back into that compartment of the tank from which the cloth has just come. From the division B' the cloth is again passed between tension-bars E' E' and roll F' into the tank B^2, and the operation may be repeated in successive tanks similarly arranged until the fabric has been sufficiently acted upon by the liquid contained in the vat. From the vat B^2 the cloth is passed

between the rolls $f f' f^2$ to the machine for saving the selvages hereinbefore described; thence to the drying-chamber and around the heated revolving drums or cylinders M N O P. When it emerges it is dry, and is then brushed between rolls furnished with card clothing, which removes the burr or spile which may be loose upon the surface and previously destroyed by the passage of said fabric through the liquid contained in the tank A.

I claim—

1. In a machine for destroying vegetable matter from woven fabrics, the combination of vats or tanks provided with fixed divisions $e e'$ and sliding compartments $c c'$, and the grids or grates D D, with the tension-bars and feed-rolls, actuated by mechanism, as herein described, for feeding the cloth continuously through the various divisions of the main vat A, substantially as stated.

2. In a machine for destroying vegetable matter from woven fabrics, the combination, with the vat A and its operative parts, of the device herein shown for saving the selvages of the fabric undergoing treatment, consisting of the tank or tanks K, adapted to contain the neutralizing-liquor and the pairs of rollers $l l'$, &c., and reservoir L, substantially as described.

3. In a machine for destroying vegetable matter from woven fabrics, the general combination of the vat A with its operative parts, the device for preventing the destruction of the lists or selvages of the cloth in process of treatment, and the series of steam-pipes and drums with the pair or pairs of rolls provided with card clothing, all substantially as and for the purposes set forth.

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

JOSEPH HACKING RILEY.

Witnesses:

JOHN DOWNHAN ELTON,
Bury.

WILLON WILLIAM BALL,
1 *St. James Square, Manchester.*