

E. Waite.
Felting Machine.
N^o 40087 *Patented Sep. 22, 1863.*

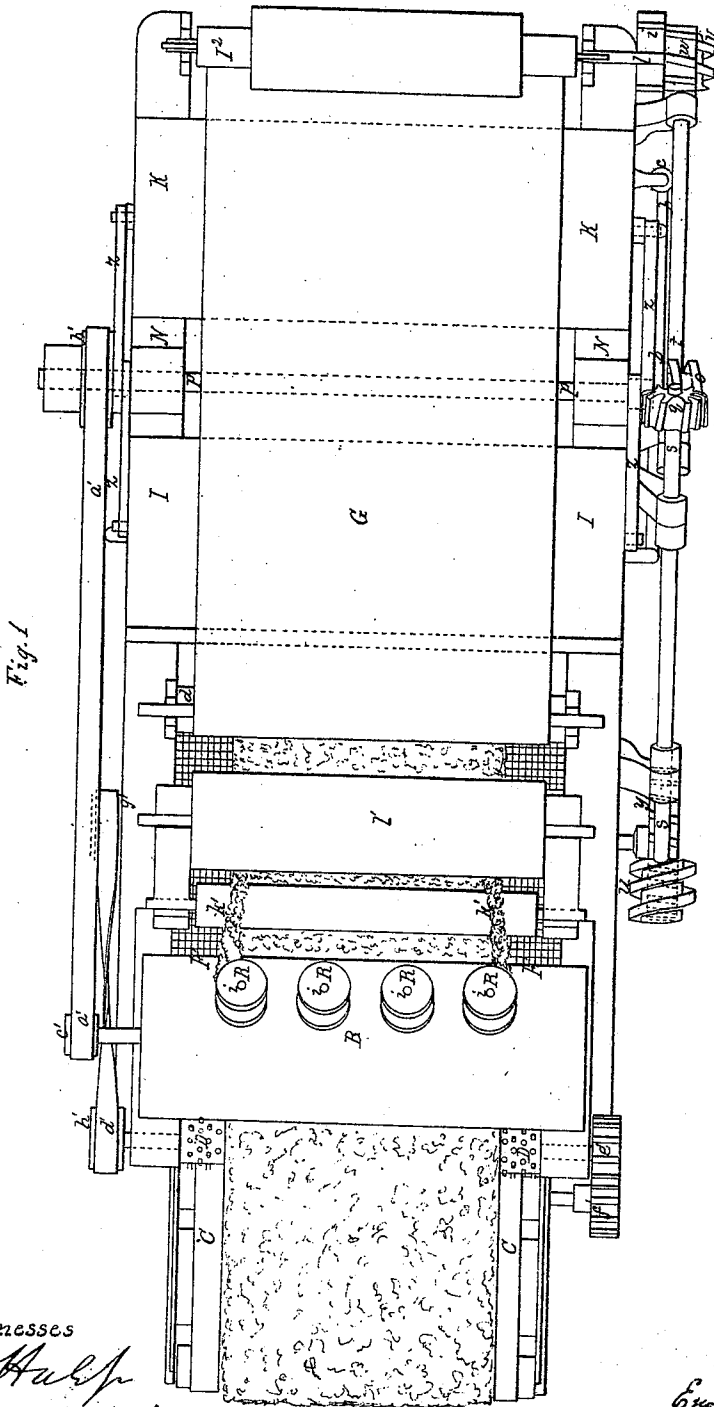


Fig. 1

Witnesses
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Inventor
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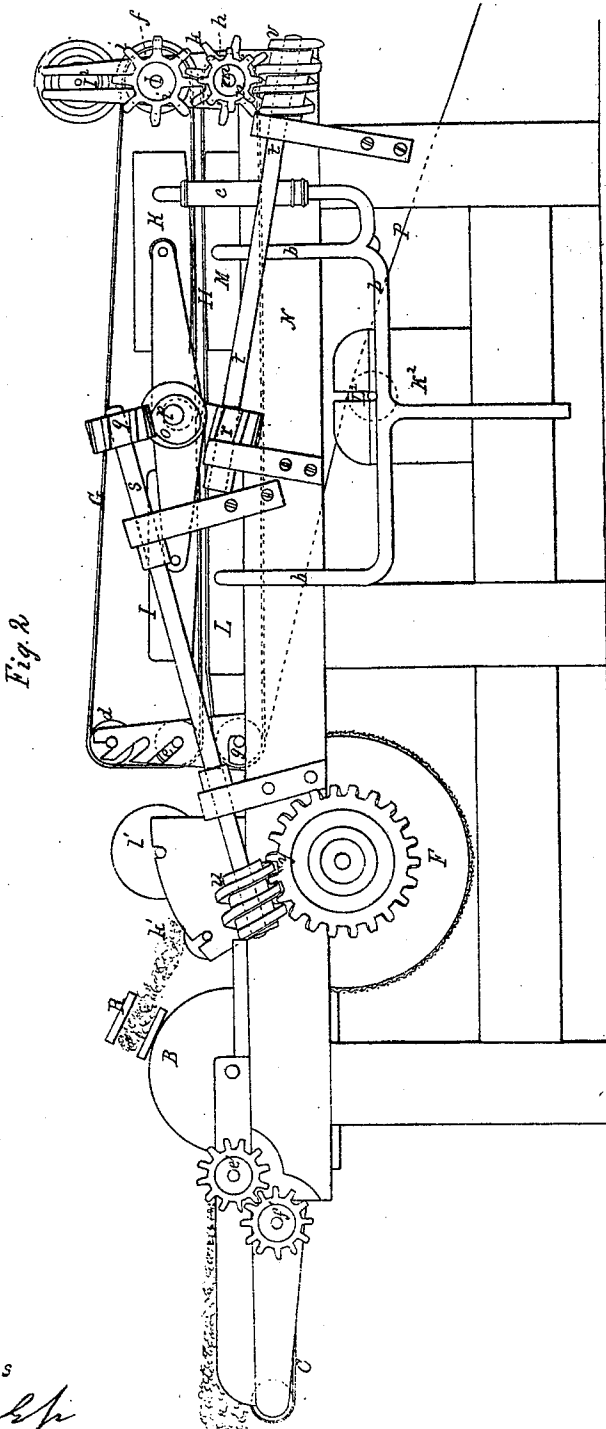


Fig. 2

Witnesses

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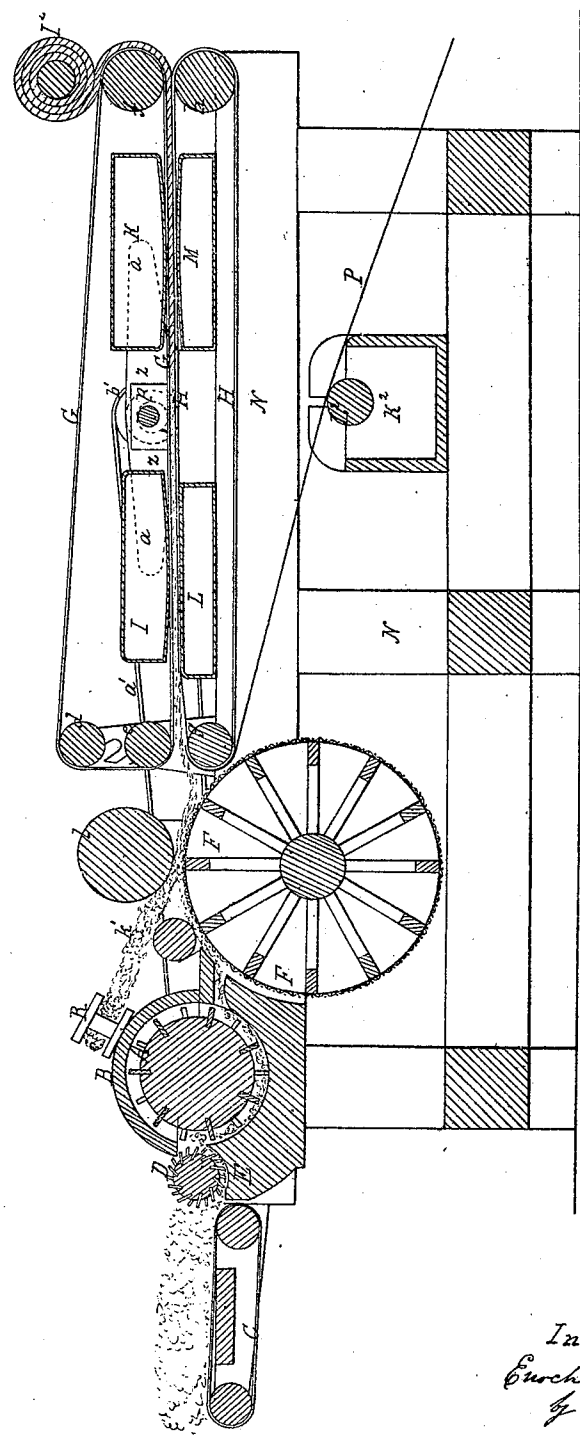
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Felting Machine.

N^o 401287

Patented Sep. 22, 1863.

Fig. 3



Witnesses
D. H. ...
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UNITED STATES PATENT OFFICE.

ENOCH WAITE, OF LAWRENCE, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE BERKELEY MANUFACTURING COMPANY.

IMPROVEMENT IN FELTING-MACHINES.

Specification forming part of Letters Patent No. 40,087, dated September 22, 1863.

To all whom it may concern:

Be it known that I, ENOCH WAITE, a citizen of Lawrence, in the county of Middlesex and State of Massachusetts, have made a new and useful invention having reference to the Manufacture of Felt or Felted Fabrics; and I do hereby declare the same to be fully described in the following specification, and represented in the accompanying drawings, of which—

Figure 1 is a top view, Fig. 2 a side elevation, and Fig. 3 a vertical and longitudinal section, of the machinery constituting my invention.

The nature of my invention consists as follows: In a combination of a picker, a perforated drum or wire cylinder, or its equivalent, and machinery for felting wool or other fibrous material or materials; also, in the combination of a pasting apparatus with machinery for felting, or with the same a perforated drum, or its equivalent, and a picker arranged and so as to operate together, substantially as hereinafter described; also, in the combination of one or more striping-bobbins, or the mechanical equivalent thereof, with the machinery for felting, or with the same a perforated drum, or its equivalent, and a picker arranged and so as to co-operate substantially as hereinafter described; also, in the combination of a felting mechanism, as described, and a means of heating one or more of its platens, whereby they are rendered capable of drying and smoothing the felted fabric, or the same and the paper to which the felt may be cemented.

The picker, constituting one feature of my invention, is composed of a large toothed cylinder, A, (covered by a cap, B,) a feeding-apron, C, and a small toothed cylinder, D, arranged over a stationary bar, E, the whole being disposed as shown in the drawings.

Directly in front of the picker there is a hollow drum or cylinder, F, which, except at its ends, is made of woven wire with meshes, or is perforated with numerous air passages or holes. In advance of the said cylinder F is a felting apparatus composed of two endless aprons, G H, and certain stationary and movable platens I K L M, arranged with respect to one another as shown in the drawings. The two lower platens are stationary

in the frame N, and serve to support the upper part of the lower apron, H, which passes directly over them, both platens extending laterally through the apron. The upper two or movable platens pass through the upper apron, G, and are to vibrate, or each is to have a reciprocating horizontal motion imparted to it while the machine may be in operation. Either one or both of these platens I K should be hollow, or contain a chamber, *a*, for the reception of steam or highly-heated air, or any other well-known means of heating the said platen. Each of the lower platens is also made hollow or with a chamber in it for the reception of steam, such chamber being provided with a supply pipe or conduit, *b*, to lead from a steam-generator. Another and flexible conduit, *c*, should also lead from the supply-pipe *b* into the upper platen, K. Each platen so heated may have a means of discharging the water which may be produced by condensation of the steam within it.

The upper endless apron is supported by and works around three rollers, *d e f*, while the lower apron works around two rollers, *g h*, the whole being arranged as shown in Fig. 3. The foremost two of the rollers—viz., *f* and *h*—are for driving or moving, as well as for supporting their aprons, and they are connected by gears *i k*, affixed on the irrelative shafts *l m*. The endless felting aprons are to travel at the same rate of speed as that of the periphery or curved surface of the hollow cylinder F, for the accomplishment of which a worm or endless screw, *o*, carried by a horizontal shaft, *p*, engages with two worm-gears, *q r*, fixed on the ends of two separate shafts, *s t*, arranged as shown in Fig. 1. Each of these shafts carries an endless screw or worm, *u* or *v*. One of such screws—viz., *v*—engages with a worm-gear, *w*, fixed on the shaft of the roller *h*. The other screw, *u*, engages with a larger worm-gear, *y*, fixed on the shaft of the cylinder F.

The mechanism for vibrating each of the upper platens consists of two connecting-rods or bars, *z z*, jointed to opposite ends of each of them and applied respectively to eccentrics carried by the shaft *p*, which is the driving-shaft of the machine. An endless belt, *a'*, going around a pulley, *b'*, on the driving-shaft,

and another pulley, *c'*, on the shaft of the toothed cylinder A, serves to put such cylinder in revolution.

The feeding-apron C and the toothed cylinder D derive their motions from an endless belt, *d'*, and two gears, *e' f'*. The belt *d'* goes around two pulleys, *g' h'*, carried by the shafts of the cylinders F and D, the gears *e' f'* being applied to the shafts of the cylinder and the front roller of the endless apron C. Furthermore, the machine is furnished with a cloth beam or roller, *I*², for reception of the fabric, as made and delivered by such machine, such roller being arranged as shown in Figs. 1, 2, and 3.

Underneath the lower felting-apron is a size or paste reservoir, *K*², carrying a roller, *L*², the whole being arranged as shown in Figs. 2 and 3. The purpose of this sizing or pasting apparatus is to apply size or paste to the lower surface of a long strip or sheet of paper which is to be conducted from a roll of it, and into the machine, as indicated by the red line P in Fig. 3. The sheet of paper is to pass between the two endless felting-aprons, and is to receive on its upper surface the felted fabric, and be cemented to it by the paste or cement, which may be applied to such sheet of paper by the roller of the paste trough or reservoir.

Along on the upper surface of the cap B one or more bobbins, R R R, are arranged, in manner as shown in Figs. 1, 2, and 3, each bobbin being supported by and so as to be capable of revolving freely on a spindle, *v'*, extending upward from the cap. Threads or rovings *k' k'*, carried on these bobbins, extend, respectively, under a roller, *U*, and down upon the fleece or lap which may be formed on the cylinder F. While the said cylinder may be in revolution, it will draw the threads or rovings off the bobbins, and they will run through the machine with the felted fabric made by it, and will be felted into such fabric. When these threads or rovings are of different colors from that of the material of which the felted fabric may be composed, they will impart to it a striped appearance.

In the operation of this machine the wool or fibrous material to be felted is to be laid on the endless delivering-apron C, from whence it will pass through the picker and be blown upon the upper surface of the cylinder F,

where it will form a vat. From the cylinder F the bat passes between the felting-aprons, and prior to going between them should be wet or moistened by jets of steam discharged upon it. While the bat may be passing between the felting-aprons the action of the movable platens on it will be such as to cause its fibers to compact and felt together. The sheet of felt, after passing from between the felting-aprons, will be wound on the cloth-beam.

By means of the said machine felt may be manufactured without the material of which it may be composed being first carded by a carding-engine. It may also be made on and cemented to a sheet of paper, and it may have stripes of different color or colors applied to it, as described.

I claim—

1. A combination of a picker, a perforated cylinder, F, or its equivalent, and machinery for felting, the whole being arranged and so as to co-operate substantially as described.

2. A machine or combination composed not only of machinery for making felt, but of a mechanism or apparatus for applying paste or cement to a sheet of paper, or the equivalent thereof, when applied to make felt, in manner and under circumstances substantially as described.

3. The combination composed of felting mechanism, a pasting apparatus, a perforated or woven wire cylinder, F, and a picker, the whole being made and arranged so as to co-operate substantially as specified.

4. I do not claim the incorporating of rovings of different colors with a felt fabric, whether for ornamentation or otherwise, but what I do claim is the combination of one or more striping-bobbins, R R, or the equivalent thereof, and suitable supporting devices therefor with the machinery, substantially as described, for producing a felt fabric.

5. In combination with the felting mechanism, a means of heating one or more of its platens, whereby they may be rendered capable of drying and smoothing the felted fabric, or the same and the paper to which it may be cemented.

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Witnesses:

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F. P. HALE, Jr.