J. SHORT.

FINISHING WOVEN FABRIC.

No. 190,786. Patented May 15, 1877

Fig. 1.

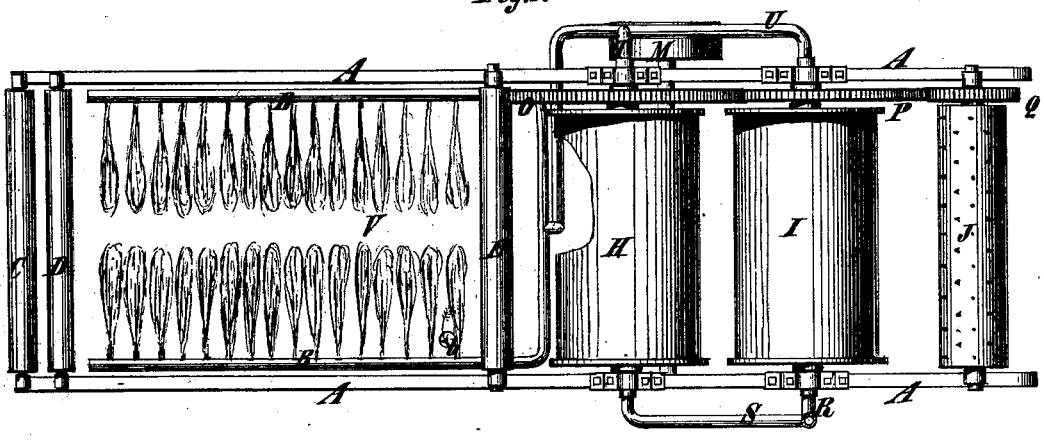


Fig. 3

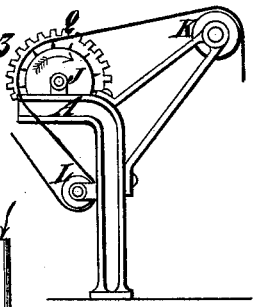
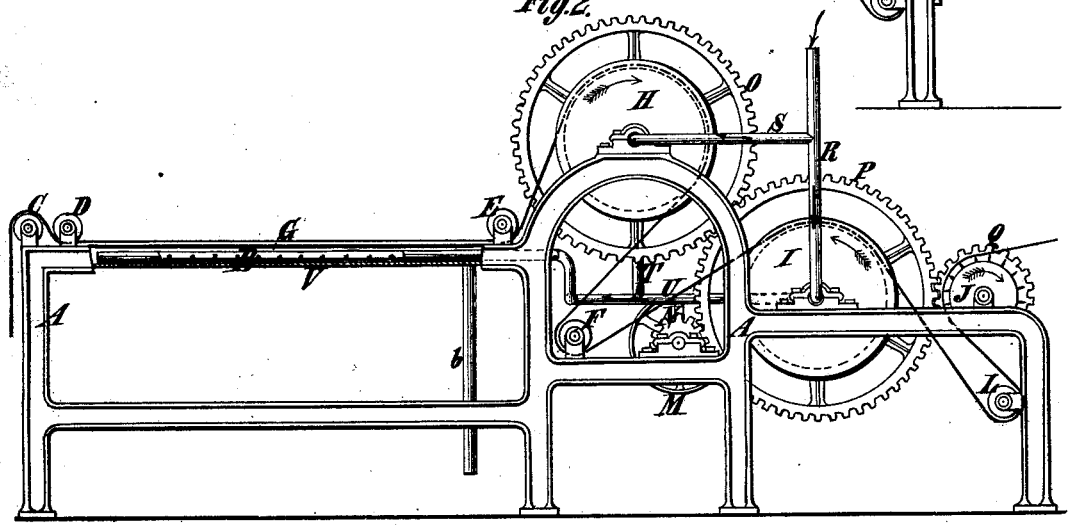


Fig. 2.



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JAMES SHORT, OF EAST NEW BRUNSWICK, NEW JERSEY.

IMPROVEMENT IN FINISHING WOVEN FABRICS.

Specification forming part of Letters Patent No. **190,786**, dated May 15, 1877; application filed October 17, 1876.

To all whom it may concern:

Be it known that I, JAMES SHORT, of East New Brunswick, township of Raritan, in the county of Middlesex and State of New Jersey, have invented Improvements in Finishing Woven Fabrics, of which the following is a specification:

My invention relates to the finishing of woven fabrics from which the dressing applied to the threads to facilitate weaving is not removed prior to sending them to market; and it is especially intended for use in the finishing of pile carpets, and will be described with especial reference to these goods.

In order to insure a clear comprehension of the advantages of the invention I deem it desirable to advert briefly to the old process of finishing pile carpets for the market. It consists in applying to their backs some stiffening substance and drying and calendering them. The expense of this stiffening substance adds materially to the cost of the goods, and the process of finishing is additionally objectionable, because it renders the pile liable to be marred, and overloads the goods with stiffening substances, from which disagreeable odors are often emitted.

Certain of my improvements consist in a novel process of finishing woven fabrics of the kinds above described, wherein the thread-dressing is moistened, preferably by means of steam or other vapor permeating the fabrics and raising their pile or nap, and subsequently resetting the said dressing, and, preferably, without the addition of other stiffening substance, whereby, without overloading the fabrics with stiffening substances, and, therefore, without rendering them so liable to emit the disagreeable odors which sometimes emanate from those substances, the fabrics may be much more economically finished for the market than by the old process previously adverted to.

Other improvements consist in combinations of parts, forming superior machinery for use in finishing woven fabrics.

In carrying out my process I prefer to pass the fabrics, by means of rollers, over steam escaping under a pressure sufficient to cause it to thoroughly permeate them from the back and raise their pile, and subsequently to pass them over drying and calendering machinery; for the operation, being thus made continuous, may be pursued indefinitely.

Having given a general idea of my invention, I will proceed now to describe it in detail, referring to the accompanying drawing, in which Figure 1 is a plan or top view of an example of this machinery. Fig. 2 is a side elevation thereof, and Fig. 3 is a detail view of a contrivance over which the finished fabrics are delivered from the machinery.

Similar letters of reference designate corresponding parts in all the figures.

The frame A of the machinery may be of any suitable form. B designates means for emitting the vapor which is to act on the fabric to be finished. As represented, they consist of perforated pipes, which, when properly supplied with steam or other vapor, will emit it in numerous small jets. The fabrics to be finished are, by means of suitable guide-rollers C D E, passed with the pile uppermost over these pipes, as indicated by the single black line in Fig. 2, and are thence passed onward to drying machinery, which will be presently described. Below these pipes B is a drain, V, provided with a leader-pipe, *b*, for collecting and conveying away liquid formed by condensation of the vapor.

Although very simple and convenient, this example of the means for emitting vapor is not the only one which may be embodied with my invention. They may be varied indefinitely. Steam-generating apparatus may be arranged so that the escaping steam may act upon the fabric; for example, I may use a pan of water from which steam may be generated, and when this is used the drain apparatus is unnecessary.

G (see Fig. 2) designates a foraminated or reticulated covering of inoxidizable material, such as canvas, arranged above the means for emitting vapor, but below the path of the fabric. It combines three things—a shield to prevent the vapor, when under too great pressure, from injuring the fabric, a distributer to cause the vapor to act uniformly on all parts of the fabric, and a guard for preventing the fabric, if accidentally slackened, from sustaining injury by contact with the heated surface of the means for emitting vapor. The advan-

tage of making this part G of inoxidizable material is, that if the fabric should come in contact with it, it will not be soiled by any rust or other oxide.

H designates a rotary cylinder, constituting the drying mechanism, over which the fabric, with the pile outward, is passed after leaving the means for emitting vapor. It may be heated in any suitable manner, and may be made to serve as the means for feeding the fabric along, and it may be necessary to supplement it by other cylinders to effect the proper drying of some fabrics.

I designates a cylinder constituting the calendering machinery, around which the fabric, in order to effect the calendering of its back, is passed with the pile outward, after having turned around a guide roller, F, which, with this arrangement of the drying and calendering cylinders, is necessary to give it a proper bearing on them.

The calendering-cylinder is preferably rotated reversely to the drying-cylinder; but it is possible to make it perform its work otherwise. It is preferably heated, and, if suitable devices are employed to feed the fabric along, may serve both as a drying and calendering cylinder.

J is a roller constituting the means for feeding the fabric and delivering it over the roller K, Fig. 3, from the machinery. It has its surface adapted to suitably engage with the fabric, and the latter passes over it, pile outward, after turning around a guide-roller, L, which is employed to cause it to have an extended bearing on both this feeding-roller and the calendering-cylinder. Motion may be imparted to the cylinders H I and the feed and delivery roller J by any suitable means—for instance, by a belt applied to a belt-pulley, M, and gear-wheels N O P Q.

As before intimated, the drying and calendering cylinders may be heated in various ways. I have shown pipes R S leading to them for the purpose of supplying steam to circulate within and heat them, and other pipes, T U, leading from them, and connecting with the perforated pipes B for emitting vapor. In this way steam may be used first to heat the cylinders, and afterward to act upon the fabric. This is very advantageous, because it dispenses with a number of connections between the machinery and the source of the steam, and enables the steam to be used twice over, besides allowing steam to be heated sufficiently for the drying and calendering cylinders, and yet cooled by its passage through them, so that it will not injure the fabric when allowed to escape upon it.

By my invention the fabric, passing over the escaping vapor, is thoroughly moistened and heated, and the pressure of the vapor, acting on the pile while in this condition, raises it up into proper form. The dressing which was applied to the threads preparatory to weaving the fabric is also thoroughly moistened. Arriving at the drying machinery, the moisture in the fabric is converted into vapor, which also tends to raise the pile, and preserves its shape, and, besides this, effects the drying of the dressing and stiffens the fabric. Passing onto the calendering apparatus, the fabric is still further dried, the remaining moisture being converted into vapor, and the dressing being further dried, besides which the back of the goods is calendered.

By this invention, also, the fabric is untwisted, straightened, and made perfectly uniform, whereby it is altogether much improved, and is made more marketable.

It will, therefore, be seen that by my invention I very materially improve the appearance of the fabrics at a very slight cost.

The machinery which I have described, or parts of it, may be used advantageously in finishing other woven fabrics.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The process of finishing pile carpets and other woven fabrics, wherein the dressing applied to the component threads is allowed to remain after weaving, by moistening said dressing and effecting the resetting thereof, preferably without the addition of other stiffening substance.

2. In the above process of finishing pile carpets and other woven fabrics, wherein the dressing applied to the component threads is allowed to remain after weaving, moistening the latter, preferably without the addition of other stiffening substance, by escaping steam or other vapor, and subsequently resetting the stiffening substance and calendering the fabrics, substantially as and for the purposes set forth.

3. The combination of the pipes B, covering G, of canvas, drain V *b*, rotary drying-cylinder H, reversely-rotating calendering-cylinder I, pipes R S T U, feed and delivery roller J, gear-wheels, and guide-rollers, substantially as and for the purpose set forth.

JAMES SHORT.

Witnesses:
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